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Indonesia's Balance of Payments until the COVID-19 Pandemic Period

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Abstract. This research uses a monetary approach with an error correction model in analyzing the Balance of Payments (BOP) from 1990 until the COVID-19 pandemic in Indonesia. From the results of data analysis, it is known that all variables of the monetary approach have a strong effect on the change of BOP in Indonesia with the except interest rates and price levels. During the COVID-19 period Indonesian foreign exchange reserves tended to increase at the end of 2020. Its value was above international adequacy standards.

Keywords: Foreign Exchange Reserves, Monetary Approach, International Balance of Payments, Error Correction Model, Pandemic, COVID-19

JEL Classification: E50, E52, E59

Background

The international balance of payments is one indicator of the dynamics of international economic activity in a country, including Indonesia. Many theories have been developed to explain this as written by Masdjojo (2010), namely: 1) Pre-Classical, 2) Classical, 3) Keynesian, 4) Monetary, and 5) Growth Constraint Model. This study uses a monetary theory that has a connection between the independent variable and the dependent variable. The first variable consists of Economic Growth, Domestic Credit, Foreign Exchange Rates, Interest Rates, and Price Levels. Meanwhile, the dependent variable can be related to the Foreign Exchange Reserves.

The Monetary theory states that economic growth has a positive effect on the Foreign Exchange Reserves. The findings of Masdjojo (2010; 2016; 2019), Nopirin I (1983), Nopirin II (1998), Djiwandono (1980), and Budiono (1979). However, contrary to the findings of Nusantara (2000), Osisanwo, et al. (2019), Tijani (2014), Sanusi (2019), and Uli (2016) in line with this statement.

Then the monetary theory also states that Domestic Credit has a negative effect on the Foreign Exchange Reserves. The findings of Masdjojo (2010; 2016; 2019), Nopirin I (1983), Nopirin II (1998), Djiwandono (1980), Budiono (1979), Ayentimi & Boateng (2013), and Osisanwo, et al. (2019) are in line with this statement. However, this is contrary to the findings of Nusantara (2000), Osisanwo, et al. (2019), and Tijani (2014).

Furthermore, the monetary theory also states that foreign exchange rates have a positive effect on the Foreign Exchange Reserves. Previous research findings that are in line with this statement are Sanusi (2019), Febriyanti (2013), Bin & Xun (2014), and Masdjojo (2010; 2016; 2019). However, contrary to the findings of Osigwe Osisanwo, et al. (2019) and Mildyanti & Triani (2019), Ayentimi & Duasa (2007).

The Monetary theory also states that interest rates have a negative effect on the Foreign Exchange Reserves. This statement has been proven from the results of research from Mildyanti Ayetirni & Boateng (2013), Nopirin I (1983), Nopirin II (1998), Djiwandono (1980),

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Budiono (1979), and Masdjojo (2010; 2016; 2019). However, this is different from the findings of Osisanwo, et al. (2019).

Finally, the monetary theory also states that the Price Level has a positive effect on the Foreign Exchange Reserves. If the domestic currency depreciates against foreign currencies, the domestic price will increase as a result the demand for nominal money also increases. If this cannot be met by domestic sources, the monetary authority will increase the interest rate. This will attract money inflows from abroad in order to push up a surplus in the international balance of payments.

Sanusi (2019) uses the variables of exports, inflation rates, exchange rates, and imports. Osigwe & Onoja (2015) used the GDP variable, oil export, exchange rate, foreign direct investment, lending rate, and inflation.

This research purpose is to re-analyze the influence of each monetary variable from 1990 until the COVID-19 pandemic time. The main objective is to examine and analyze the effect of GDP growth, Domestic Credit growth, the Exchange Rate, the Domestic Interest Rate, and the Domestic Price Level on Foreign Exchange Reserves. This research uses Indonesia's data in the period 1990-2020.

Literature Review

International Balance of Payments Theory

Masdjojo (2010) has classified the theory of the International Balance of Payments into 1) Pre-Classical Theory, 2) Classical Theory, 3) Keynesian Theory, 4) Monetary Theory, and 5) Theory of Growth Constraints. This study uses Monetary Theory. The foreign exchange reserve was the dependent variable. The independent variables used are economic growth, domestic credit, foreign exchange rates, interest rates, and price levels.

The monetary theory states that changes in the BOP can make some impacts to money supply. If there is a surplus in the BOP, then the domestic money supply increases. If there is a deficit in the BOP, then the domestic money supply decreases. These changes in the money supply can affect the changes in price level.

Previous Research

Previous studies had analyzed changes in foreign exchange reserves in several countries. Each researcher found different results. The difference lies in the sign/direction of influence, the value of the coefficient, and the level of significance of the impact of each Monetary variable on changes in Foreign Exchange Reserves. Each of these research findings has different theoretical and policy implications as well. Some previous studies are in Tables 1 and 2 below.

Table 1: Some Relevant Previous Researches

Researchers	Description
Osigwe & Onoja (2015)	Oil exports were positive and significant determinant of RESV. Exchange rate was significant but negative determinant of RESV. FDI was positive and significant determinant RESV Lending rate (LR) was not significant determinant. Inflation rate was negative and significant. Non-oil and gas export was not a significant determinant of RESV.
Febriyenti (2013)	Net exports, foreign debt and foreign exchange reserves in the past period in Indonesia were significantly affected. FDI variable did not affect foreign exchange reserves in Indonesia. The Indonesian economy, the Japanese economy and the exchange rate affect net exports in Indonesia.

Wiguna (2016)	Exports and foreign debt have a significant effect on foreign exchange reserves in Indonesia.
Uli (2016)	Foreign exchange reserves are significantly affected by the movement itself at a probability of 1%. Export, Import and Exchange Rate variables do not affect on foreign exchange reserves.
Bin & Xun (2014)	The US financial market risk premium is the most important determinant of changes in nominal returns, while the US dollar exchange rate and bulk commodity prices are the two main determinants of changes in the real rate of return. The loose monetary policy of the US Federal Reserve increased the nominal rate of return on China's foreign exchange reserves, but lowered the real rate of return. The European debt crisis has had an uncertain impact on China's foreign exchange reserves.
Ayentimi & Boateng (2013)	The balance of payments inequality in Ghana is not only influenced by monetary variables. Of the four monetary independent variables, three were found to be significant. The results also show that domestic credit, GDP growth, and interest rates are significant. Domestic credit and interest rates are negatively related to net foreign assets while GDP growth is positively related. However, inflation is less closely related to net foreign assets. However, government spending and public debt can affect the balance of payments in Ghana.
Olokoyo, et al. (2009)	Olokoyo, et al. (2009) examined the interactive effect of foreign exchange reserves (FRS) on several macroeconomic variables for the period 1970-2007. The results obtained from the cointegration test, vector error correction (VEC) in the framework of autoregressive distribution lags (ARDL) revealed that the accumulation of large foreign exchange reserves was not very productive in Nigeria because of its inability to induce several macroeconomic variables.
Aizenman & Hutchison (2012)	Aizenman & Hutchison (2012) evaluated how the global financial crisis originally in the US was transmitted to emerging markets. The results found clear evidence that emerging markets with higher total foreign liabilities, including short and long term debt, equity, FDI and their derivatives - have greater exposure and are much more vulnerable to financial crises.
Masdjojo (2010)	In the long term changes in Foreign Exchange Reserves are influenced by Economic Growth, Changes in Domestic Credit, Exchange Rates and Interest Rates. The direction of influence is under the Monetary Approach to the Balance of Payment (MABP).
Tijani (2014)	The application of the monetary approach as an adjustment mechanism to correct balance of payments dis-equilibrium in Nigeria for the period 1970-2010. The estimation results show a positive relationship between the dependent variable (BOP) and the Independent variable (Domestic Credit, Exchange Rate and Trade Balance) while (Inflation Rate and Gross Domestic Product) on the contrary.
Masdjojo, et al. (2016)	In the long term National Income, Domestic Credit, Exchange Rates and Interest Rates can change. Indonesian economy needs 6-7 quarters (1.5 years) to reach a new equilibrium.
Sanusi (2019)	Exports, inflation rates, exchange rates and imports have a significant positive effect on foreign exchange reserves in the long term, except for import demand. Meanwhile, capital inflows are not significant in the long term.

Mildyanti & Triani (2019)	The exchange rate and portfolio investment have a significant positive effect on foreign exchange reserves in Indonesia. Net exports have a negative and insignificant effect on foreign exchange reserves in Indonesia. Meanwhile, the exchange rate has a negative and insignificant effect on foreign exchange reserves in China. Net exports have a significant positive effect on China's foreign exchange reserves. Meanwhile, the investment portfolio has a negative and significant effect on foreign exchange reserves.
Maheasy (2019)	Exports have a positive and significant effect on Indonesia's foreign exchange reserves while imports have a negative and significant effect on Indonesia's foreign exchange reserves.
Masdjojo (2019)	Interest Rates, Economic Growth, Domestic Credit and Exchange Rates had a significant effect on Indonesia's Foreign Exchange Reserves. Except that the Domestic Credit variable has no effect on Indonesia's Foreign Exchange Reserves in that period.
Osisanwo, et al. (2019)	The results show that there is a long-term relationship between monetary policy variables and balance of payments adjustments. Further findings reveal that in the long run, the money supply and trade balance has a positive impact on balance of payments adjustments in Nigeria.
Bosnjak et al. (2020)	The results reveal a quantity-dependent determinant of foreign exchange reserves and allow comparisons between the two countries, showing the joint movement between monetary policy and economic fluctuations. This study is more inclined to compare the role of foreign exchange reserves in Serbia and North Macedonia.

Source: Summary for this research, 2021

Table 2: Summary of previous research findings

Variables	Positive	Negative	No Significant
Product Domestic Bruto	Osigwe & Onoja (2015), Ayentimi, Duasa Duasa (2007)	Osisanwo, et al. (2019)	Sanusi (2019) Uli (2016)
Credit		Ayentimi & Boateng (2013), Osisanwo, et al. (2019)	Uli (2016)
Exchange Rate	Febriyanti 2013 Bin & Xun (2014)	Osigwe Osisanwo, et al. (2019)	Mildyanti & Triani (2019) Uli 2016, Ayentimi, Duasa (2007)
Interest Rate	Osisanwo, et al. (2019)	Ayentimi & Boateng (2013)	
Price Level	Osigwe, bin Bin & Xun (2014)	Osisanwo, et al. (2019)	Ayentimi

Source: Summary for this research, 2021

Research Hypothesis

The Exchange Rate and the Foreign Exchange Reserves

According to MABP that if the local currency of a country depreciates or the foreign currency experiences appreciation, the domestic price will increase which in turn will increase the demand for nominal money. If this increased demand for money cannot be met by domestic sources, the interest rate will increase and encourage the flow of funds from abroad to increase

in a short term which causes a surplus in the balance of payments. The surplus will continue until the excess demand for money is gone. This effect is only transitory. In the long run, depreciation only increases prices according to the monetary approach. However, according to the Monetarist during the transition period, depreciation will have a positive impact in the form of an increase in international reserves (due to an increase in exports) or an increase in the monetary base originating from the domestic component and will not harm the balance of payments. However, if the market has the automatic ability to adjust to changes, then depreciation will have no impact, even in the short term.

Hypothesis: Exchange Rate has a positive effect on Foreign Exchange Reserves.

The Economic Growth and the Foreign Exchange Reserves

According to MABP Economic Growth will affect the balance in the domestic money market through changes in the demand for domestic money. An increase in economic growth will increase the demand for money. If the increase in demand is not matched by the government's expansion of domestic credit, the increase will result in a surplus to the balance of payments. Therefore, according to MABP, the relationship between Economic Growth and the position of the BOP (foreign reserves) is positive.

Hypothesis: Economic growth has a positive effect on Foreign Exchange Reserves.

The Interest Rate and the Foreign Exchange Reserves

According to MABP if the domestic interest rate rises, then through the balance of the money market, the demand for domestic money increases so that the value of the domestic currency experiences appreciation against foreign currencies. This causes the competitiveness price to decrease so that exports decrease and imports increase. This means Foreign Exchange Reserves decreased. And vice versa. Therefore, according to MABP, the relationship between the interest rate and the position of the BOP (foreign reserves) is negative.

Hypothesis: Interest rates have a positive effect on Foreign Exchange Reserves.

The Domestic Credit and the Foreign Exchange Reserves

According to MABP if for some reason Domestic Credit has increased, then this will cause an increase in the money supply in the community. An increase in the money supply can encourage an increase in aggregate demand. If this condition is not followed by an increase in aggregate supply, it will encourage inflation. Inflation then harms exports. If the value of exports is less than imports, this will eventually lead to a deficit in the balance of payments. Furthermore, it can reduce the country's foreign exchange reserves.

Hypothesis: Domestic Credit has a negative effect on Foreign Exchange Reserves.

The Price Level Variable and the Foreign Exchange Reserves

According to MABP if for some reason the Domestic Price Level of a country increases, then it will encourage the monetary authority to issue a policy of increasing interest rates so that it will attract foreigners save their funds in domestic banks through the money market which impact the increase of Foreign Exchange Reserves. However, this condition is a short-term.

Hypothesis: Domestic Price Level has a positive effect on Foreign Exchange Reserves.

The Research Model

Change in Foreign Exchange Reserves (FER) depends on the sum of the Current Account (CA) balance with the Capital and Financial Transactions (CFT) balance. In the form of a mathematical equation can be written as follows:

$$FER = CA + CFT \quad (1)$$

The balance of CA depends on the value of exports and imports. The size of the value of exports and imports depends on their influencing factors. The export value depends on foreign exchange rates and international income. The import value depends on Economic Growth and foreign exchange rates.

The CFT balance depends on the capital inflow (CI) and capital outflow (CO). The factors that affect capital flow are the domestic interest rate and the international interest rate.

Therefore, the factors that affect changes in Foreign Exchange Reserves are Economic Growth, Foreign Exchange Rate, Domestic Credit, Price Level, and Interest Rates. The functional equation can be expressed as follows:

$$DEV_t^* = f(PN_t, KD_t, NTV_t, HRG_t, TB_t) \quad (2)$$

Furthermore, equation (1) above can be written in the form of a regression equation which is expressed in a long-run or equilibrium relationship as follows:

$$DEV_t^* = b_0 + b_1 PN_t + b_2 KD_t + b_3 NTV_t + b_4 HRG_t + b_5 TB_t + \varepsilon_t \quad (3)$$

$$b_1 > 0; b_2 < 0; b_3 > 0; b_4 > 0; b_5 < 0; \varepsilon_t \approx 0 b_1 > 0; b_2 < 0; b_3 > 0; b_4 > 0; b_5 < 0; \varepsilon_t \approx 0$$

To analyze the growth aspects of the variables mentioned above, equation (2) can be written in a semi-logarithmic form as follows:

$$LnDEV_t^* = b_0 + b_1 LnPN_t + b_2 LnKD_t + b_3 LnNTV_t + b_4 LnHRG_t + b_5 TB_t + \varepsilon_t \quad (4)$$

$$Ln = LogaritmaNatural; \varepsilon_t = disturbanceError$$

The description of equations (1), (2) and (3) are: *DEVt* = Foreign Exchange Reserves; PNt = Gross Domestic Product (GDP); KDt = Domestic Credit; NTVt = Exchange Rate USD/IDR; HRGt = Price Level; TBt = Interest rate; Ln = Natural Logarithm; b0 = constant; bi = regression coefficient; Xi t = time period.*

Data Analysing Technique

This study uses quarterly time series secondary data in the period 1990-2020. Data was obtained from various domestic and international publications. The data was then analyzed using the two steps Engle-Granger Error Correction Model (2SEG_ECM) technique. The formulated model is:

dlnDEV = a + b1dlnPDB + b2dlnKD + b3dlnExchange + b4dPrice + b5dInterest + ECT +e

The analysis process starts from determining the value of the Error Correction Term (ECT). To get the ECT value, it is performed by first generating the long-term equation of the Foreign Exchange Reserves. Then the residual value of the equation becomes the ECT value to be included in the short-term ECM equation.

Findings Analysis

ECM Regression Analysis Procedure

Data Stationarity Test Results

Table 3: Unit root testing of research variables ADF method

Variables	Level	Critical Value 5 %	Difference	Description
Foreign Exchange	0.282950 (0.9765)	-2.885249	-8.184094 (0.0000)	Stationary at level 1st differential
GDP	0.345704 (0.9798)	-2.885051	-10.72952 (0.0000)	Stationary at level 1st differential
Domestic Credit	0.806308	-2.885051	-11.51181 (0.0000)	Stationary at level 1st differential
Exchange Rate	-1.133903	-2.885051	-11.05004 (0.0000)	Stationary at level 1st differential
Price Level	-2.005883	-2.885249	-11.87824 (0.0000)	Stationary at level 1st differential
Interest Rate	-1.695765	-2.885051	-8.15786 (0.0000)	Stationary at level 1st differential

Source: Appendix of Processed Research Data, January 2021

Based on Auckmented Dickey Fuller (ADF Test) method, it was found that the level of all variables are not stationary. Which means each variable has an increasing or decreasing trend. Based on the findings, the values of variables are changed into level one (differentiation). From Table 3, it can be seen that all research variables at level one are stationary.

Thus, estimation needs to consider the relationship between changes between independent variables and changes in the dependent variable. A suitable model for this kind of case is the ECM method. From Table 4 below, it can be seen that the ECT variable has passed the data stationarity test.

Data Cointegration Test Results

Table 4: Stationarity test results for ECT variables at level

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.561628	0.0080
Test critical values:	1% level	-3.484653	
	5% level	-2.885249	

Source: Eviews 9 Processed Output, January 2021

For the level, it is known that the ADF statistic value is -3.561628 > the critical value of 5%, which is -2.885249. According to the provisions, data analysis using ECM can be continued.

Estimation Result of Error Correction Term (ECT)

The Error Correction Term (ECT) value fulfills the requirements because it is significant with a t statistic of 2.739074 > t table (124; 0.05) is 1.96 (0.0071 < 0.05) in Table 5.

Table 5: Formation of error correction term (ECT) values

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.014759	0.003059	4.824576	0.0000
Economic Growth	-0.096490	0.034993	-2.757448	0.0068
Exchange Rate	0.004378	0.055222	0.079282	0.9369
Domestic Credit	0.032070	0.022878	1.401751	0.1637
Price Level	0.034813	0.040834	0.852553	0.3957
Interest Rate	0.019795	0.028841	0.686370	0.4939
ECT(-1)	0.251413	0.091788	2.739074	0.0071

Note: Dependent Variable: Foreign Exchange Reserves
Source: Eviews 9 Processed Output, January 2021

Classical Assumption Test Results

Normality Test Results

From Figure 1, it can be seen that the Jarque-Bera value is 5.614098 with a probability of 0.060383. Because the Jarque-Bera probability > 0.05, the residuals in the regression equation model of this study have met the assumption of normality.

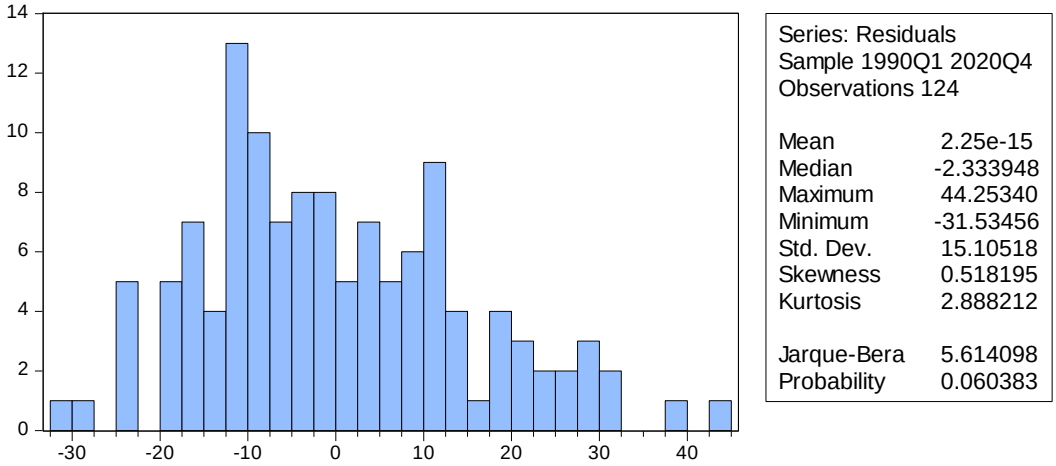

Figure 1: Graph of Jarque-Bera Normality Test
Source: Eviews 9 Processed Output, January 2021

Linearity Test Results

Table 6: Ramsey RESET test

	Value	df	Probability
t-statistic	0.601865	114	0.5485
F-statistic	0.362241	(1, 114)	0.5485
Likelihood ratio	0.387047	1	0.5339

Source: Eviews 9 Processed Output, January 2021

The short-term model satisfies the assumption of Linearity. That is shown in Table 6 with the probability value of the Ramsey RESET test for both the t, F, and Log likelihood statistics greater than alpha 0.05.

Multicollinearity

The short-run model is free from multicollinearity problems. That is shown in Table 7 with the value of Variance Inflation Factor (VIF) of all independent variables < 10.

Table 7: Variance inflation factors

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Economic Growth	0.001221	1.067441	1.009856
Exchange Rate	0.000522	1.047357	1.024440
Domestic Credit	4.21E-05	1.154438	1.142089
Price Level	0.001657	1.018089	1.017325
Interest Rate	0.003013	1.117846	1.089117
ECT(-1)	0.008467	1.035144	1.035134

Source: Eviews 9 Processed Output, January 2021

Autocorrelation Test

Table 8: Breusch-Godfrey serial correlation LM test

F-statistic	2.075111	Prob. F(2,113)	0.1303
Obs*R-squared	4.322032	Prob. Chi-Square(2)	0.1152

Source: Eviews 9 Processed Output, January 2021

The short-run model is free from autocorrelation problems. It is because of the probability value 0.1152 which is greater than alpha 0.05 in Table 8.

Heteroscedasticity Test

Table 9: Heteroskedasticity test: Breusch-Pagan-Godfrey

F-statistic	1.081433	Prob. F(6,115)	0.3777
Obs*R-squared	6.515911	Prob. Chi-Square(6)	0.3679
Scaled explained SS	15.41952	Prob. Chi-Square(6)	0.0172

Source: Eviews 9 Processed Output, January 2021

The short-term model is free from heteroscedasticity problems. It is because of the probability value 0.3679 which is greater than alpha 0.05 in Table 9.

Model Test Results and Hypothesis Testing

Estimation Results of the Long-Term Equation Model

Table 10: Long-term equation output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.019083	0.789847	7.620569	0.0000
Economic Growth	0.123579	0.042347	2.918245	0.0042
Exchange Rate	-1.173006	0.168353	-6.967532	0.0000
Domestic Credit	0.701680	0.045337	15.47691	0.0000
Interest Rate	6.46E-08	6.84E-08	0.945579	0.3463
Price Level	-2.71E-07	0.000267	-0.001016	0.9992
R-squared	0.957971	Mean dependent var		10.43587
Adjusted R-squared	0.956190	S.D. dependent var		1.061015
S.E. of regression	0.222079	Akaike info criterion		-0.124391
Sum squared resid	5.819646	Schwarz criterion		0.012074
Log likelihood	13.71223	Hannan-Quinn criter.		-0.068955
F-statistic	537.9174	Durbin-Watson stat		0.243362
Prob(F-statistic)	0.000000			

Note: Dependent Variable: Foreign Exchange Reserves
Source: Eviews 9 Processed Output, January 2021

As it is shown in Table 10, the long-term average growth of the foreign exchange variable is positive. With a constant coefficient at 6.019083 of the foreign exchange variable. It shows that the foreign exchange average growth in the period 1990 to 2020 is 6.019083%. The growth is significant with a probability at 0.0000 < 0.005.

As it is shown in Table 9, the GDP variable has a positive and significant effect on the foreign exchange variable in long term. With a coefficient of 0.123579 of the variable, it shows that if there is a 1% increase in GDP growth, it will increase by 0.12% foreign exchange growth.

In a long term, the credit variable has a negative effect on the foreign exchange variable. The offset coefficient of the Credit variable of -1.173006 indicates that if there is a 1% increase in Domestic Credit growth, it will cause a decrease in Foreign Exchange growth of -1.2%. The coefficient value is in line with the findings of previous research. The only difference is the offset coefficient.

Then from Table 9 it is also known that in a long term the exchange rate variable has a positive effect on the foreign exchange variable. The coefficient of 0.70168 indicates that in the long term if the exchange rate variable has an increase in growth of 1%, the foreign exchange variable will also increase its growth by 0.7%.

Meanwhile, the Interest Rate and Price Level variables have no effect on the Foreign Exchange variable. This is because the probability value of each variable is > 0.05.

Estimation Results of the Short-Term Equation Model

From Table 11, it is known that in a long term, the average growth of the foreign exchange variable is positive. With a coefficient of 0.014759 on the foreign exchange variable constant, it shows that the average growth of foreign exchange in the period 1990 to 2020 is 0.01%. The growth is significant with a probability of 0.0000 < 0.005.

Table 11: Output of ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.014759	0.003059	4.824576	0.0000
Economic Growth	-0.096490	0.034993	-2.757448	0.0068
Exchange Rate	0.004378	0.055222	0.079282	0.9369
Domestic Credit	0.032070	0.022878	1.401751	0.1637
Price Level	0.034813	0.040834	0.852553	0.3957
Interest Rate	0.019795	0.028841	0.686370	0.4939
ECT(-1)	0.251413	0.091788	2.739074	0.0071
Adjusted R-squared	0.094125	Durbin-Watson stat		1.900980
F-statistic	3.095425	Prob(F-statistic)		0.007578

Note: Dependent Variable: Foreign Exchange Reserves
Source: Eviews 9 Processed Output, January 2021

From Table 11, it is also known that in a short term, only Economic Growth has a significant effect on Foreign Exchange Reserves. However, the direction of the impact is negative. In the short term, when the economic growth increased, it can influence the rise of real sector ability which is caused by the current account deficit. This then reduces Indonesia's foreign exchange reserves. There is a possibility that the increase in Economic Growth in a short term will be used by some economic actors to buy short-term assets abroad so that it can cause a Capital Account deficit in the short term. With a coefficient of -0.096490 on this variable, it shows that if there is a 1% increase in Economic Growth, it will decrease by 0.09% foreign exchange growth. Meanwhile, Domestic Credit, Exchange Rate, Interest Rate, and Price Level have no effect on the Foreign Exchange in a short term.

Discussion

The Economic Growth and the Foreign Exchange Reserve

In a short-term, changes in Economic Growth have a negative effect on changes in Foreign Exchange Reserves. While in a long-term Economic Growth has a positive and significant effect on the growth of Foreign Exchange Reserves. This finding in a long term is still in accordance with the statement of MABP theory. The regression coefficient value of 0.123579 < 1 indicates that growth of foreign exchange reserves is not very responsive to GDP growth. In a long term, every 1% increase in Economic Growth will cause an increase of 0.123579% in the growth of Foreign Exchange Reserves.

The effect of Economic Growth on Foreign Exchange Reserves is in accordance with Monetarist hypothesis. It means that in a long-term, Economic growth can influence domestic money market through the shift of local currency demands. If public demand of money is not balance with government credit expansion, it will increase domestic interest rate which then affecting capital inflow. In other words, it can add foreign exchange reserves total amount.

The positive and significant effect of Economic Growth in a long term shows that in 1990 - 2020 period, proportion of Indonesia's economic growth was contributed more by the success of export activities management. The tendency of this management was larger than import activities for both goods and services. This success was achieved especially after Indonesia

continuous effort in terms of non-oil and gas exports promotion, which are strongly supported by the industrial sector.

The findings above are also in line with the findings of Richard Zecher (1974) in Australia, Sykes Wilfrod and Walton Wilfrod (1978) in Honduras, Bijan Aghevli (1974) in Indonesia, Budiono (1979) in Indonesia, Djiwandono (1980) in Indonesia, Nopirin I (1983) and II (1998) in Indonesia, Hakim (2000) in Indonesia, Djauhari (2003) in Indonesia and Masdjojo (2010) in Indonesia.

However, this finding contradicts the findings of Dodaro in 1993, which was proposed by Nusantara in (2000). According to him, low-middle income countries (including Indonesia) have a tendency not to play a role in economic growth towards export growth. Thus, the difference between Dodaro's findings and this study lies in the significance of the relationship between Economic Growth and foreign exchange reserves growth.

Exchange Rate and Foreign Exchange Reserve

In a short-term the growth of exchange rate has no effect on Indonesia's Foreign Exchange Reserves. But in a long term, the effect is positive and significant with an elasticity of 0.701680. The regression coefficient value of 0.701680 < 1 indicates that the growth of Foreign Exchange Reserves is less responsive to the growth of the exchange rate. In the long term, every appreciation of 1 percent will only cause an increase in changes in Foreign Exchange Reserves by 0.701680 percent.

This positive effect is in accordance with the statement of MABP theory. According to this approach, if the domestic currency depreciates or the foreign currency appreciates, the domestic price will increase which in turn will increase the demand for nominal money. If this increase in demand for money cannot be met by domestic sources, then Interest Rate will increase and encourage the rise of funds flow from abroad in a short term, as a result, Foreign Exchange Reserves will be surplus. The surplus will continue until the excess demand for domestic money is gone. This effect is only transitory. In a long run, depreciation according to monetary approach has no effect. In the case of Indonesia, it is proven that in a long term, Exchange Rates change will affect Foreign Exchange Reserves significantly.

The above findings are consistent with the findings of Nopirin I (1983) and II (1998) in Indonesia, Nusantara (2000) in Indonesia, Hakim (2000) in Indonesia, Djauhari (2003) in Indonesia, and Masdjojo (2010) in Indonesia.

Domestic Credit and Foreign Exchange Reserve

In a short-term, changes in Domestic Credit have no effect on changes in Foreign Exchange Reserves. In a long term, credit growth has a negative and significant effect on the growth of Foreign Exchange Reserves with a coefficient of -1.173006. This means that assuming the influence of other factors is constant, then in a short term every 1 percent increase in Domestic Credit will cause a decrease in Foreign Exchange Reserves by 1.173 percent. This means in a long term the growth of Domestic Credit by 1 percent will cause a decrease in the growth of Foreign Exchange Reserves by 1.173 percent.

The above findings are consistent with the findings of Richard Zecher (1974) in Australia, the findings of Sykes Wilfrod and Walton Wilfrod (1978) in Honduras, Aghevli and Khan (1977) in 39 Developing Countries, the findings of Djiwandono (1980) in Indonesia, Nopirin I (1983) and II (1998) in Indonesia, Nusantara (2000) in Indonesia, Hakim (2000) in Indonesia, Djauhari (2003) in Indonesia. However, the above findings contradict the findings of De Granwe (1976) in 7 European countries, Porter (1972) in Germany and Neuman (1978) in Germany, and Masdjojo (2010) in Indonesia.

Interest Rates and Foreign Exchange Reserve

In the short-term and long-term changes in Interest Rates have no effect on changes in Foreign Exchange Reserves.

This finding is not in accordance with the results of research by Richard Zecher (1974) in Australia, the findings of Sykes Wilfrod and Walton Wilfrod (1978) in Honduras, the findings of De Granwe (1976) in 7 European countries, the findings of Porter (1972) in Germany and the findings of Neuman (1978) in Germany. Their conclusion states that the effect of changes in Interest Rates on changes in Foreign Exchange Reserves is negative but not significant. However, in a long term, the above findings support the findings of Djiwandono (1980), Nusantara (2000), and Masdjojo (2010) in Indonesia.

Price Level and Foreign Exchange Reserve

In the short term and long-term changes in prices have no effect on changes in foreign exchange reserves. This finding is not in accordance with the results of research by Richard Zecher (1974) in Australia, the findings of Sykes Wilfrod and Walton Wilfrod (1978) in Honduras, the findings of De Granwe (1976) in 7 European countries, the findings of Porter (1972) in Germany and the findings of Neuman (1978) in Germany.

Foreign Exchange Reserves during the COVID-19 Pandemic

According to the Jakarta Kontan Magazine Report at the end of 2020, it was explained that the Indonesian economy in the third quarter of 2020 improved from the second quarter of 2020 which grew by minus 5.32%. Although economic growth is still at a negative level, at least there is an improvement in the third quarter of 2020.

. Indonesia's foreign exchange reserves in the early period of COVID-19, namely in March 2020, amounted to 121 billion US dollars. Until August 2020, Indonesia's foreign exchange reserves had an increasing tendency to 137 billion US dollars. Then the trend fell again to 133.6 billion in November 2020. However, in December 2020 Indonesia's foreign exchange reserves rose again to 135.9 billion US dollars. According to Bank Indonesia's Year-End Report, the increase in Indonesia's foreign exchange reserves was mainly influenced by loan withdrawals and tax revenues. The value of foreign exchange reserves achieved at the end of 2020 had already above the international adequacy standard, which is for 3 months of imports. In the case of Indonesia, the value of 135.9 billion US dollars is equivalent to financing 10.2 imports or 9.8 imports plus payments for the Indonesian Government's Foreign Debt.

Conclusion

Based on the Error Correction Term (ECT) value we can conclude that it takes approximately 6 months to reach a new balance of Foreign Exchange Reserves. In a long term, it is found that the growth of Foreign Exchange Reserves is influenced by Economic Growth, Domestic Credit, and Exchange Rates. The direction of the influence of these independent variables on Foreign Exchange Reserves growth is still consistent with the Monetary Approach on Balance of Payment (MABP).

During the COVID-19 period, Indonesia's foreign exchange reserves tend to increase. The value of Foreign Exchange Reserves was above the international adequacy standard at the end of 2020, which was for 3 months of imports. The value of 135.9 billion US dollars was equivalent to financing 10.2 imports or 9.8 imports plus payments for the Indonesian Government's Foreign Debt.

Based on the results of this study, the implementation of fiscal and monetary policies to influence each sector is still relevant. However, it is necessary to consider implementing the dominant policy mix in managing Indonesia's Foreign Sector.

For future research, it is recommended to synthesize Keynesian and Monetary theory in analyzing the dynamics of Balance of Payments. The analytical method can be developed in the simultaneous model.

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