THE EFFECT OF PALM OIL COMMODITY EXPORTS, RUPIAH EXCHANGE RATE AND INFLATION ON FOREIGN EXCHANGE RESERVES IN INDONESIA

Nur Aminah[1*], Mutia Rahmah[2], Ratna[3], Syarifah Syafira[4], Sandrina Salsabila Rambe[5]

[1*,2,3,4,] Faculty of Economics and Business, Universitas Malikussaleh, Indonesia

(nur.200430018@mhs.unimal.ac.id)

ABSTRACT

This study aims to identify the impact of palm oil exports, rupiah conversion scale and expansion on foreign trade ownership in Indonesia. This study uses time series information from Food and Agriculture, the World Bank, and Bank Indonesia for 32 years, from 1990 to 2022. After that, the Autoregressive Distributed Lag (ARDL) model is used to conduct data analysis. This study found that palm oil exports have a positive and significant impact on foreign exchange reserves over time, while the palm oil export variable has a positive and insignificant impact on reserves in the short term. The conversion scale variable affects foreign trade ownership temporarily but in the long term, the swapping scale makes a positive and irrelevant comparison. While short-term and long-term inflation have a negative and significant impact on foreign exchange reserves, the inflation variable.

Keywords: Palm Oil Exports, Rupiah Exchange Rate, Inflation, Foreign Exchange

1. INTRODUCTION

Indonesia is a nation that practices open economics. The international interactions Indonesia has with other nations demonstrate the open economic system it has adopted. The Indonesian government needs a means of payment and a reserve of funds for international activities, such as trade, in order to carry out these activities. Unfamiliar trade holds are one of the significant wellsprings of financing utilized by Indonesia in doing public turn of events. The indicator of a nation's foreign exchange reserves can show how international trade has developed and how its economic fundamentals have changed (Dananjaya et al., 2019).

Indonesia foreign exchange reserves have undergone significant shifts over the past ten years. The value of foreign exchange reserves increased from US\$ 112.78 billion in 2012 to US\$ 144.57 billion in 2021, according to World Bank data (2023). This rise, according to Bank Indonesia (2021), was brought about by the government's withdrawal of foreign loans and tax and service revenue. This development is supposed to proceed, upheld by kept up with financial strength and possibilities. Oil and gas foreign exchange, exports, foreign debt, and investment are a few of the indicators that support the expansion of foreign exchange reserves (Mildyanti & Triani, 2019).

Figure 1.

Development of Indonesia's Foreign Exchange Reserves for the Period 2012-2022 (US$ Billion)
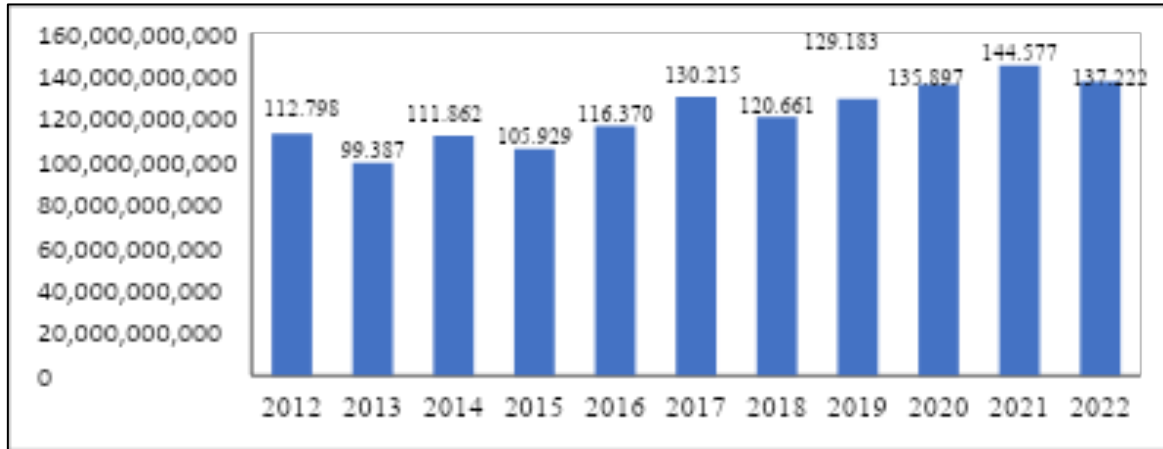

Source: World Bank Commodity Price Data (2024)

Indonesia's foreign exchange reserves tend to increase from 2012 to 2021, as seen in the graph above. The value of foreign exchange reserves experienced a decline from 112.798 billion US dollars in 2012 to 99.387 billion US dollars in 2013. This was due to the payment of unpaid obligations and the fulfillment of obligations of State-Owned Enterprises (BUMN) to pay for imports of raw materials. However, according to Bank Indonesia (2021), the tendency for Indonesia's foreign exchange reserves to increase in 2019-2021 was influenced by tax revenues and services and the withdrawal of government foreign loans. Then in 2022 the unfamiliar trade saves diminished again by 137,222 this was because of the installment of unfamiliar obligation.

There are different variables that impact the size of a country's unfamiliar trade saves, including sends out, the rupiah conversion scale and expansion. One way a country builds up its reserves of foreign currency is through exports. Oil palm exports are one of Indonesia's biggest exports, coming from the agricultural sector, specifically the plantation subsector.

Figure 2.

Development of Palm Oil Exports in Indonesia 2011-2022 in (US$)
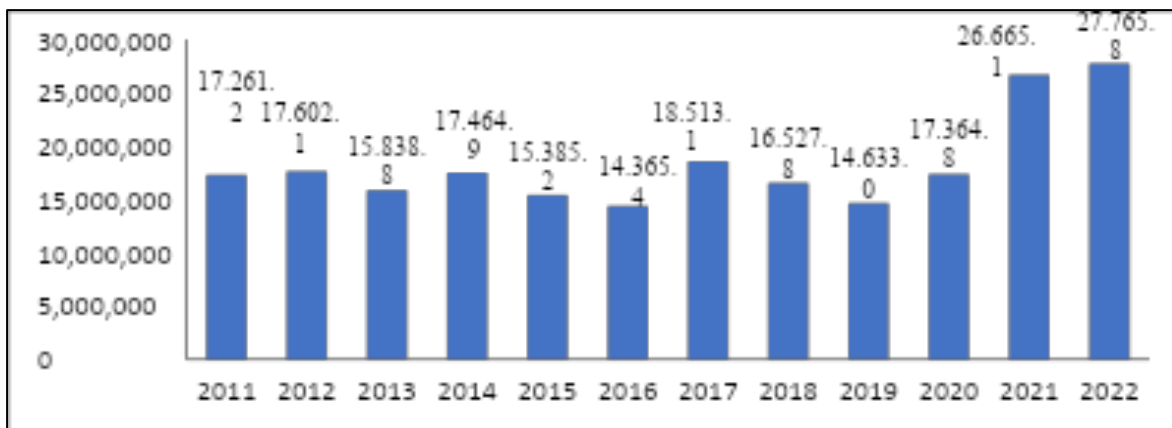
Source: Food and Agriculture Organization (FAO), 2024.

The value of palm oil exports has decreased from 16,527 thousand US dollars to 14,633 thousand US dollars, according to World Bank and FAO data for 2018-2019. On the other hand, foreign exchange reserves have increased from 120,661 billion US dollars to 129,183 US dollars. Exports of palm oil have increased in 2021 and 2022 due to rising global demand, which has led to a significant increase in the palm oil export price.

Moreover, the marker that influences unfamiliar trade saves is the rupiah conversion scale. The number of currency units required to obtain one unit of foreign currency is called the exchange rate (S). Nature, 2007). The relationship between exchange rate and foreign exchange reserves is that a country's ability to carry out international economic and financial transactions and currency value are inversely proportional to the amount of foreign currency held by its residents and government. Additionally, a country's economy is more robust when its currency exchange rate is higher, allowing it to earn more in foreign exchange.

Figure 3.

Development of Rupiah Exchange Rate in Indonesia in 2011-2022 (IDR)
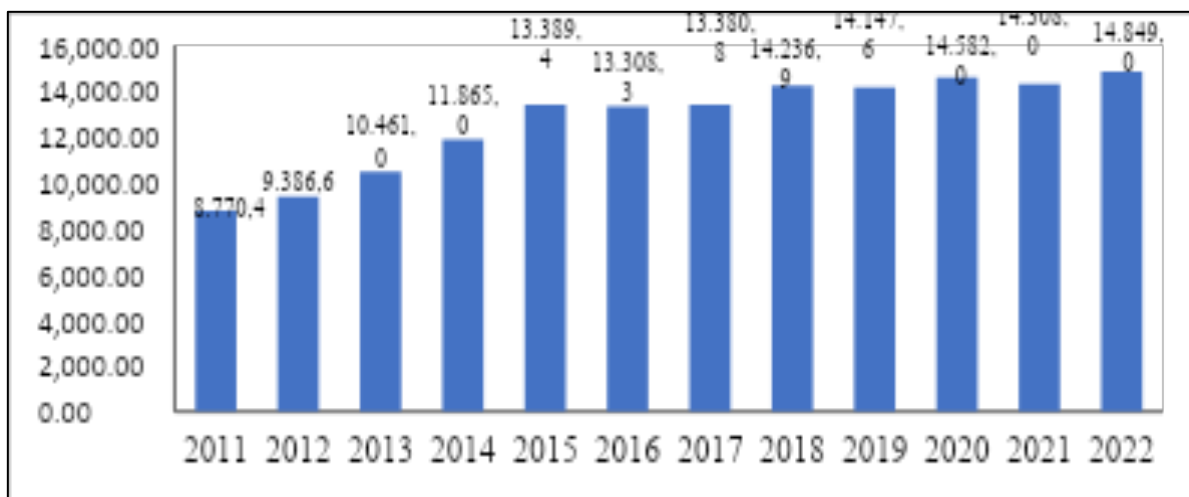
Source: Food and Agriculture Organization (FAO), 2024.

The enthusiasm for the rupiah conversion scale against the US dollar in view of Figure 1.3, in 2018 added up to Rp14,236/1 US $ to Rp14,147/1 US $ in 2019. Although this certainly resulted in a reduction in Indonesia's foreign exchange reserves, the amount of Indonesia's foreign exchange reserves from 2018 to 2019 experienced an increase of 129.183 billion US dollars, from 120.654 billion US dollars in 2018. This is in contrast to the results of research by Sitohang and Sudiana (2017) entitled "The Effect of Net Exports, Dollar Exchange Rates, and Inflation on Indonesia's Foreign Exchange Reserves for the Period 1990-2016". This research found that exchange rates have a positive and significant effect on foreign exchange reserves, and the greater the exchange rate of a country, the greater the amount of foreign exchange reserves that will be obtained (Sitohang & Sudiana, 2017).

Inflation is one aspect that affects foreign exchange reserves. Based on Utari et al, (2015), inflation is a very important macroeconomic indicator. As such, expansion is a condition where different

costs rise generally and happen ceaselessly because of a few elements. Assuming that the costs of labor and products will more often than not ascent or expansion happens, the country's monetary exercises will be hampered, which requires more unfamiliar trade to execute with different nations. Subsequently, to keep expansion from expanding, how much cash available for use should be as per the requirements so the dependability of the conversion standard is kept up with.

Figure 4.

Inflation Development in Indonesia 2011-2022
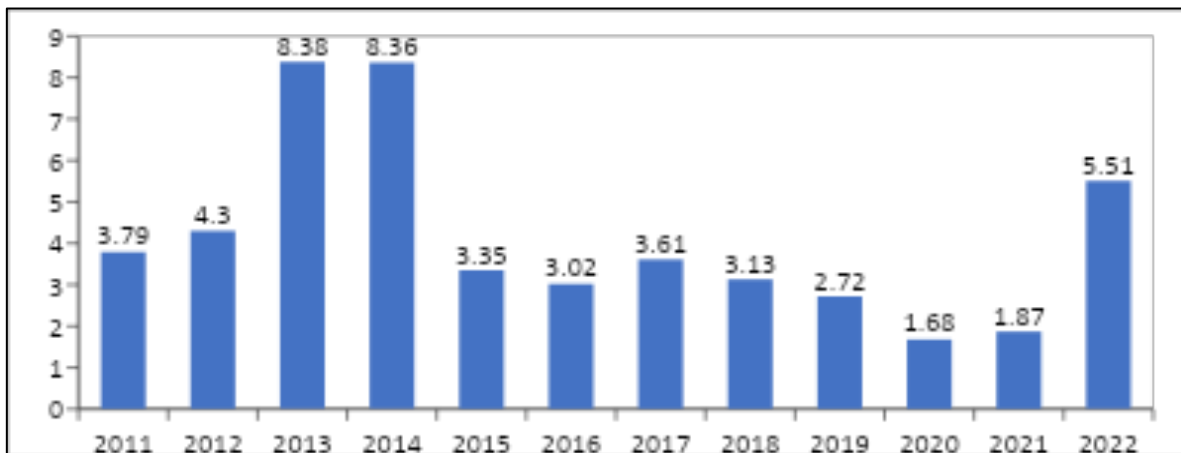
Source: World Bank Commodity Price Data, 2024

Expansion from the most recent 10 years has changed, in 2011 expansion added up to 3.79% down contrasted with 2010 of 6.96%, this is because of a decline popular for labor and products. After that, it went up by 8.38 percent in 2013, which was caused by an increase in food prices. In 2014, it went down, which was caused by a decrease in demand for goods and services. From 2015 to 2019, inflation fluctuated, and from 2020 to 2021, it tended to go down because of a decrease in purchasing power caused by the COVID-19 pandemic.

2. LITERATURE REVIEW

2.1 Palm Oil Export

Send out is the arrival of products from the Indonesian traditions region to be sent to another country by following the pertinent arrangements, particularly in regards to customs guidelines and completed by an exporter or who gets an extraordinary permit from the Directorate General of Unfamiliar Exchange, Service of Exchange. Amir (2004) defines export as the process of selling goods to other nations in exchange for monetary compensation for their ownership of commodities. Likewise, trades additionally include the utilization of unknown dialects in the exchange of ware products. Trade is a cycle where different nations purchase merchandise from homegrown organizations. The capacity of a country to produce goods that are able to compete in foreign markets is an aspect that greatly supports the success of exports. Based on the definition above, export is the process of producing goods from the customs area in exchange for a trade activity in the form of goods and services that can expand the market and create foreign exchange.

2.2 Exchange Rate

Ekananda (2014) explains that the exchange rate is the price of a country's currency against another country's currency. Because the conversion standard includes 2 monetary forms, the balance is not entirely determined by the organic market side of the two monetary forms. In other words, the exchange rate of a currency against one unit of another country's currency is known as the exchange rate.

2.3 Inflation

According to Christianingrum & Syafri (2019) inflation is a general and ongoing rise in the cost of goods. Only if the increase is widespread or results in price increases for other goods can it be referred to as inflation? Simply put, inflation is the trend toward sustainable price increases for goods and services overall.

3. METHODOLOGY

3.1 Research Design

This study employs a quantitative approach for its method. In this review, the information utilized is optional information with time series information from 1990-2022 for a very long time. The *Food and Agriculture Organization* (FAO), the Central Bureau of Statistics, and the World Bank provide the data used.

3.2 Data Analysis

In this research, a dynamic model analysis method known as Autoregressive Distributed Lag (ARDL) is used to investigate the relationship or influence of Indonesian rubber exports on international price creation, inflation, and exchange rates. Gujarati (2013) said that the ARDL (Auto Regressive Distributed Lag) model is a combination of the AR (AutoRegressive) and DL (Distributed Lag) models. The ARDL model, which combines independent and dependent variables and uses information from the past and present, is used in this research. Equating the t-table value indicates whether variable X has an influence on variable Y and vice versa in the ARDL estimate. Variable X can be said to influence Y if the t-statistic value is greater than the t-table value.

3.3 Stationarity Test (Unit Root Test)

To avoid pseudo-regression when analyzing time series data, data stationarity test must be performed Testing data stationarity also known as stationary stochastic process is an important step in estimating economic models using time series data. Augmented Dickey-Fuller (ADF) is used in this study to test data stationarity at the same level or different levels) until stationary data is obtained that is, data with a variance that is not too large and is generally close to the mean. If the mean and variance remain constant over time and the covariance between data depends only on the lag, then the data is considered stationary (Widarjono, 2013).

3.4 Optimum Lag Determination

The difficulty of determining the lag at which the variable will provide a reliable estimate is one that frequently arises with the ARDL model. The degree of freedom (df) will be reduced by a lag that is too long, while misspecification will result from a lag that is too short (Gujarati, 2013).

3.5 Cointegration Test (Bound Test).

In the wake of leading the joining test, it tends to be seen at what degree the time series information will be fixed. The next step is to carry out a cointegration test, which is a test that is used to ascertain whether the model has a long-term equilibrium between its variables, as suggested by economic theory. In other words, there is a relationship over time if the model's variables are cointegrated (I. Rahmawati & Laila, 2020).

3.6 Estimation of ARDL (Autoregressive Distributed Lag) Model

The Autoregressive Distributed Lag (ARDL) model is a regression method that takes into account the Lag of dependent variables and independent variables simultaneously (Rahmasari et al., 2019). By using the ARDL model, the influence of dependent variables and independent variables on time can be proven, including the influence of past dependent variables on current independent variables. In general, the ARDL model equation can be written as follows:

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \, \Delta Y_{t-1} + \sum_{i=1}^{n} \delta_1 \, \Delta x_{t-1} + \varphi_1 \, Y_{t-1} + \varphi_2 \, x_{t-1} + \mu_t \qquad (3.1)$$

Information:

β_1, δ_1: Short-term coefficient

φ_1, φ_2: Long-term coefficient

μ_t: Disturbance error (whitenoise)

3.7 ARDL Model Stability Test

The structural stability of the model is tested to ensure whether the model in this study is normal. This test consists of the Cumulative Recursive Sum of Residuals (CUSUM) and Cumulative Recursive Sum of Squares (CUSUMQ) tests. The blue CUSUM line between the 2 red lines with 5% significance in the CUSUM test results for the ARDL model in this study shows the stability of the model. The fact that the CUSUM line for the ARDL model is located between the significance lines shows that the ARDL model is stable.

4. RESULTS AND DISCUSSION

4.1 Stationarity Test

Table 1

Stationary Test Results

Variabel	Unit Root test	PP Test Statistic	Critical Value (5%)	Probabilty PP	Information
Foreign Exchange Reserves	Level	-1.8816	-2.9571	0.3363	Non Stationer
	1st *Difference*	- 5.8778	-2.9604	0.0000	Stationer
Palm Oil Exports	Level	- 1.4274	-2.9571	0.5565	Non Stationer
	1st *Difference*	-7.3088	-2.9604	0.0000	Stationer
Rupiah Exchange Rate	Level	-1.7146	-2.9571	0.4146	Non Stationer
	1st Difference	-5.8531	-2.9604	0.0000	Stationer
Inflation	Level	-5.2046	-2.9571	0.0002	Stationer
	1st Difference	-27.1605	-2.9604	0.0001	Stationer

Source: Research Results, 2024 (Data Processed)

According to Table 4.1, the results of stationarity testing using the Phillip-Perron unit root test indicate that the four variables in this study are stationary at the first different level. These variables are inflation, rupiah exchange rates, foreign exchange reserves, and palm oil exports. Where the likelihood esteem is underneath 0.05 (Prob <0.05), which shows that all factors can be tried further utilizing the first unique.

4.1.1 Determination of Optimum Lag

Table 2

Optimum Lag Results

R-squared	0.997441	Mean dependent var	10.74452
Adjusted R-squared	0.994882	S.D. dependent var	0.337882
S.E. of regression	0.024171	Akaike info criterion	-4.301068
Sum squared resid	0.008179	Schwarz criterion	-3.593846
Log likelihood	77.36548	Hannan-Quinn criter.	-4.079575
F-statistic	389.8085	Durbin-Watson stat	2.615978
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model
   selection.

Based on Table 4.5, the average value is at 4. Thus, in this study, the optimal lag length to be used is 4.

4.1.2 Bound Test

Table 3

Cointegration Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=30		
F-statistic	13.10172	10%	2.676	3.586
K	3	5%	3.272	4.306
		1%	4.614	5.966

Source: Research Results, 2024 (data processed)

It can be concluded that the level of significance of F-statistics is greater than the level of significance of I(0) and I(1); the impact is that there is cointegration in the variables in the model being tested, so that there is a balance in the short and long term. The results of the above limit test show the results of cointegration, where the F-statistic value is 13.102 from the Basic Limit or I(0) and the Upper Limit or I(1), where the F-statistic > I(0) at the value of I(0) = 2.68.

4.1.3 Estimation of Short-Term and Long-Term ARDL Models

The following can be said about the Short-Term Testing of the ARDL model based on the table above:

$$\Delta CDV_t = 0.0560\Delta EKS_t - 0.3061\Delta EKS_{t-1} - 0.1270\Delta EKS_{t-2} + 0.0798\Delta EKS_{t-3} -$$
$$0.2645\Delta NTR_t - 0.4248\Delta NTR_{t-1} - 2.291\Delta INF_t + 1.501\Delta INF_{t-1} + 1.611\Delta INF_{t-2} +$$
$$4.841\Delta INF_{t-4} - 0.902 Ect \qquad\qquad (4.1)$$

The CointEq(-1)/Ect(-1) model value of -0.902 is significant at the 1% level, which shows that this model has short-term and long-term cointegration. In addition, the CointEq(-1) value of -0.902 is used to calculate the rate of adjustment to change (Shock). If the coefficient is negative and significant at the 5% level, the ECT or CointEq(-1) value is valid. If this model faces a shock, the shock will disappear after 13 months.

Table 4

Short-term ARDL Estimation Results

ECM Regression Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EKS)	0.056099	0.042455	1.321376	0.2076
D(EKS(-1))	-0.306135	0.057237	-5.348537	0.0001
D(EKS(-2))	-0.127063	0.048000	-2.647159	0.0191
D(EKS(-3))	0.079893	0.047528	1.680963	0.1149
D(NTR)	-0.264509	0.062786	-4.212842	0.0009
D(NTR(-1))	-0.424896	0.094356	-4.503106	0.0005
D(INF)	-2.29E-05	2.49E-06	-9.223906	0.0000
D(INF(-1))	1.50E-05	3.16E-06	4.736771	0.0003
D(INF(-2))	1.61E-05	2.87E-06	5.614877	0.0001
D(INF(-3))	4.84E-06	2.26E-06	2.140680	0.0504
CointEq(-1)*	-0.902247	0.098311	-9.177436	0.0000

Source: Research Results, 2024 (data processed)

The palm oil shipment aspect in the current year has a collelfilsieln value of 0.560, which implies that palm oil trade in the current year is positive and immaterial to foreign trade ownership. This shows that current foreign exchange reserves are not significantly affected by the palm oil export variable in the current year.

The palm oil export variable one year earlier has a coefficient value of -0.306, which is negative and significant at the 1% level. This shows that the current year's foreign exchange reserves are negatively affected by the previous year's palm oil exports. The coefficient of palm oil exports at (-2) is -0.127, which means that the palm oil export variable 2 years earlier is negative and significant at the 5% level. (-3) has a correlation value of 0.080, which means that the current year's palm oil exports have a positive but insignificant effect on foreign exchange reserves. This shows that the palm oil exports 2 years earlier have a negative and significant effect on the current year's foreign exchange reserves. This shows that the current resistant foreign exchange reserves are not significantly affected

by the palm oil export variable for the previous 3 years. The current year's rupiah swapping scale variable has a coefficient value of -0.265, which means that the current year's rupiah conversion standard variable is negative and significant at the 1% level. With a probability value of 0.0009 ± 0.01, this shows that the rupiah exchange rate has a negative and significant effect on the current year's foreign exchange reserves.

The rupiah conversion scale at (-1) has a coefficient value of -0.424, this means that the rupiah swapping scale variable for the last 1 year has a negative value and is critical at the 1% level. With a probability value of 0.0005 ± 0.01, this shows that the rupiah exchange rate has a negative and significant effect on current year foreign exchange reserves.

The current year inflation variable has a coefficient value of -2.29, this shows that the variable has a negative and significant value at the 1 percent level. With a probability value of 0.0000 ± 0.01, this shows that inflation has a negative and significant effect on current year foreign exchange reserves. Expansion at (-1) has a coefficient value of 1.50, this means that the last 1 year expansion variable has a positive and large value at the 1% level. With a probability value of 0.0003 ± 0.01, this shows that inflation has a positive and significant effect on current year foreign exchange reserves. The expansion at (-2) has a coefficient value of 1.61, and this implies that the expansion variable in the last 2 years is positive and critical at the 1% level. With a probability value of 0.0001 ± 0.01, this shows that inflation has a positive and significant effect on current year foreign exchange reserves. The inflation coefficient at (-3) is 4.84, this indicates that the inflation variable over the previous 2 years is positive and significant at the 5% level. With a probability value of 0.0504 ± 0.05, this indicates that inflation has a positive and significant effect on current year foreign exchange reserves.

4.1.4 Long-term Testing

Long-term testing demonstrates how long-term estimation results are processed. The table below shows the results of the long-term estimation:

Table 5

Long-term Estimation Results

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EKSPOR_KELAPA_SAWIT	0.467053	0.021649	21.57374	0.0000
NILAI_TUKAR_RUPIAH	0.200034	0.040250	4.969791	0.0002
INFLASI	-5.58E-05	1.05E-05	-5.310210	0.0001
C	47.75919	7.730153	6.178298	0.0000

EC = CADANGAN_DEVISA - (0.4671*EKSPOR_KELAPA_SAWIT + 0.2000
    *NILAI_TUKAR_RUPIAH -0.0001*INFLASI + 47.7592)

Source: Research Results, 2024 (data processed)

Using the ARDL model in the table can be formulated as follows, based on the table of long-term test results:

$$\Delta CDV_t = 47.7591 + 0,4670\Delta EKS_t + 0.2000\Delta NTR_t - 5.581\Delta INF_t \qquad (4.2)$$

The consistent worth of 47.76 really intends that assuming palm oil sends out, the rupiah swapping scale and expansion are steady (fixed) in the long haul, then Indonesia's unfamiliar trade stores will likewise be steady at 47.76 and this outcome is huge with a likelihood of 0.0000> 0.01. With a coefficient value of 0.4670, palm oil exports will increase foreign exchange reserves by 0.47 percent in the following year for every one percent increase in exports. With a probability value of 0.0000 0.01, palm oil exports have a positive and significant effect on Indonesia's foreign exchange reserves.

The coefficient value of the rupiah exchange rate is 0.2000. This means that if the rupiah exchange rate increases by one percent, palm oil exports and foreign exchange reserves will increase by 2 percent in the following year. Because the probability is 0.0002 <0.01, the rupiah exchange rate has a positive and significant effect on Indonesia's foreign exchange reserves. Expansion has a coefficient value of 0.0000558, which means that assuming the expansion response increases by 1%, foreign trade reserves will decrease by 5.5% in the following year. Expansion affects foreign trade reserves in Indonesia, because the probability is 0.0001 <0.05.
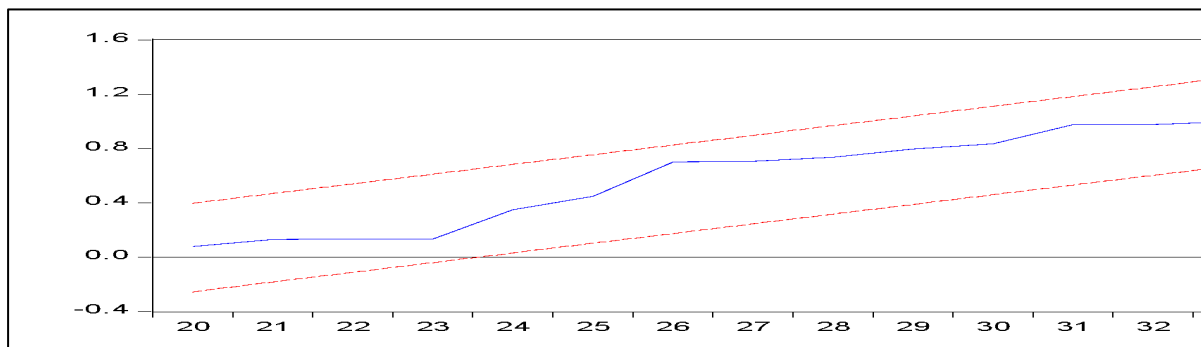
4.1.5 Model Stability Test

Figure 6.

CUSUM Test Results
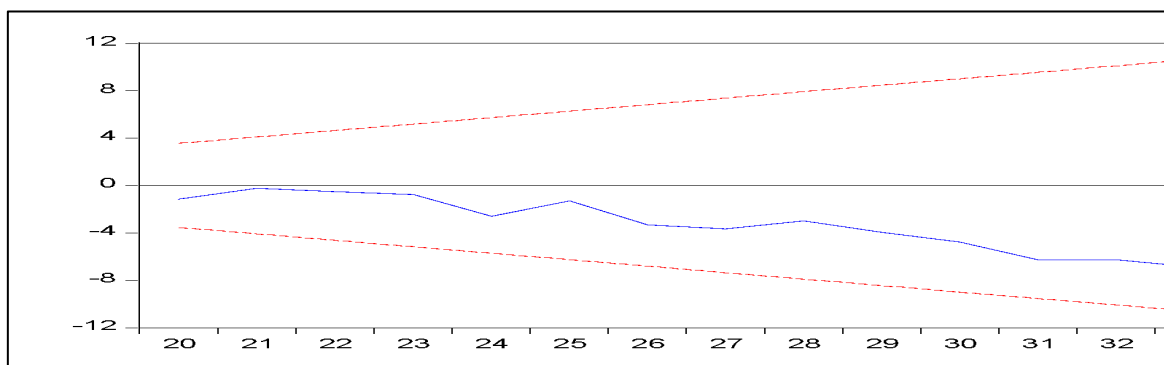
Figure 7

CUSUMQ Testing Results

4.2 Discussion

4.2.1 The Effect of Palm Oil Exports on Foreign Exchange Reserves in Indonesia

The current palm oil trade variable affects Indonesia's foreign exchange reserves that other countries do not have. This indicates that foreign exchange reserves will increase if palm oil exports decline. At that time, the quality of palm oil was poor, causing a decline in exports. Although palm oil exports have a positive but insignificant impact because of several aspects, including high imports where export proceeds are used to finance imports, exports have the potential to increase foreign exchange reserves. The impact is that there is no increase in foreign exchange reserves because the trade balance is either balanced or deficit.

Palm oil exports have a positive and significant impact on foreign exchange reserves in the long term. This indicates that Indonesia's foreign exchange reserves will grow in response to the increase in palm oil exports. In the long term, exports have a positive and significant impact on Indonesia's foreign exchange reserves, according to Moulida's research (2020). Meanwhile, Irawan's research (2019) shows that products affect trade reserves that other countries do not have in the long term.

4.2.1 The Effect of Exchange Rate (Exchange Rate) on Foreign Exchange Reserves in Indonesia

Indonesia's short-term foreign exchange reserves are negatively affected by the exchange rate variable (exchange rate). This means that assuming the standard conversion reaction response increases (the rupiah exchange rate weakens) it will cause Indonesia's foreign exchange reserves to decrease. This research is in accordance with research conducted by Kuswantoro (2017) and Agustina (2014) who formulated that the exchange rate has a significant and negative effect on Indonesia's foreign exchange reserves.

The exchange rate variable has a positive and significant effect on foreign exchange reserves in the long term. This means that Indonesia's foreign exchange reserves will increase if the exchange rate variable continues to increase over time. The findings of this research are in accordance with Anugerah's research (2012) which found that the rupiah exchange rate significantly increases foreign exchange reserves.

4.2.1 The Effect of Inflation on Foreign Exchange Reserves in Indonesia

Indonesia's short-term foreign exchange reserves are negatively affected by the inflation variable. This indicates that if the price of goods and services tends to rise, or if inflation occurs, it will limit economic activity in the country concerned. The impact is that the country will need a lot of foreign currency to do business outside the country which will reduce its foreign exchange reserves. The findings of this study are in line with the research of Dananjaya (2019) which found that Indonesia's foreign exchange reserves are negatively affected by the inflation variable.

In the long term, expansion significantly affects foreign trade reserves. This is in accordance with research led by (Agustina, 2014). This research found that the inflation rate has a negative and significant impact on foreign exchange reserves.

5. CONCLUSIONS AND SUGGESTIONS

5.1 Conclusions

In view of the aftereffects of the above research, the accompanying ends can be drawn:

1. Palm oil exports have a significant impact on foreign exchange reserves in the long term, while exports have a positive but insignificant impact on reserves in the short term. This shows that Indonesia's foreign exchange reserves will increase along with the increase in palm oil exports.

2. Short-term, the exchange rate (kurs) has a significant and negative impact. This truly intends that assuming the conversion scale (swapping scale) increments (rupiah debilitates) it will decrease unfamiliar trade holds in Indonesia. While in the long haul, the conversion scale (kurs) affects Indonesia's unfamiliar trade saves. That is, assuming the conversion scale (swapping scale) increments (rupiah debilitates) it won't influence the unfamiliar trade stores of Indonesia.

3. Inflation has a negative and significant impact on foreign exchange reserves over the short and long term. Specifically, if inflation rises, foreign exchange reserves will decrease.

4.2 Suggestion

Given the findings of the study on the impact of palm oil exports, rupiah exchange rate (exchange rate), and inflation on Indonesia's foreign exchange reserves, the following recommendations can be made:

1. Policies aimed at increasing palm oil exports through product quality enhancement and diversification to improve global competitiveness are expected to be developed and supported by the government and related agencies in order to support palm oil exports. In addition, it is essential to foster innovation in the palm oil industry in order to boost export potential and product added value.

2. It is trusted that the public authority can keep up with the security of the rupiah swapping scale so there is no decrease in unfamiliar trade saves.

3. It is recommended that researchers who will conduct similar research in the future use different research methods, include additional variables that influence economic growth, and extend the time period for data analysis.

REFERENCES

Agustina, A. (2014). Pengaruh ekspor, impor, nilai tukar rupiah, dan tingkat inflasi terhadap cadangan devisa indonesia. *Jurnal Wira Ekonomi Mikroskil*, *4*(2), 61-70. https://doi.org/10.55601/jwem.v4i2.214

Christianingrum, R., & Syafri, R. A. (2019). Faktor-faktor yang memengaruhi inflasi inti di Indonesia. *Jurnal Budget: Isu dan Masalah Keuangan Negara*, *4*(2), 18-39.

Dananjaya, I. putu A. B., Jayawarsa, A. A. K., & Purnami, A. A. S. (2019). Pengaruh Ekspor, Impor, Kurs Nilai Tukar Rupian, Dan Tingkat Inflasi Terhadap Cadangan Devisa Indonesia Periode 1999-2018. *Warmadewa Economic Development Journal (WEDJ)*, *2*(2), 64–71.

Ekananda, M. (2014). *Ekonomi Internasional*. Jakarta: Erlangga.

Mildyanti, R., & Triani, M. (2019). Analisis Faktor-Faktor Yang Mempengaruhi Cadangan Devisa (Studi Kasus Di Indonesia Dan China). *Jurnal Kajian Ekonomi dan Pembangunan*, *1*(1), 165-176. https://doi.org/10.24036/jkep.v1i1.5363

Sitohang, T. A., & Sudiana, I. K. (2017). Pengaruh Net Ekspor, Kurs Dollar, Dan Inflasi Terhadap Cadangan Devisa Indonesia Pada Kurun Waktu Tahun 1990-2016. *Jurnal Ekonomi Pembangunan*, *1*(1), 152–178.

World Bank. (2023). *World Bank*. World Bank. https://data.worldbank.org/

Widarjono, A. (2017). *Ekonometrika Pengantar dan Aplikasinya Disertai Panduan Eviews* (Edisi Keti). UPP STIM YKPN: Yogyakarta.