The Influence of International Trade on the Rupiah Exchange Rate

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A R T I C L E I N F O

A B S T R A C T

Fluctuations of exchange rate against in the Rupiah can be influenced by international trade which makes the Rupiah exchange rate depreciate or appreciate. The purpose of this study is to recognize the differences in the effect of international trade variables on the Rupiah exchange rate. The model considered for maintaining variables can connect the effects of international trade with the Rupiah exchange rate that occurred before using the Ordinary Least Square (OLS) method. OLS estimation shows that the independent variables, namely exports, imports, and interest rates have a significant influence on the expectations of the Rupiah exchange rate, while variable interest rates cannot significantly influence the Rupiah exchange rate. In conclusion, the export, import and interest rates policies are considered to affect the rupiah exchange rate if Indonesia does not change interest rates simultaneously and other macro policy variables.

INTRODUCTION

International trade is an activity in which goods are bought and sold overseas and payments are made in foreign currencies. International trade is often also referred to as the export and import of goods that are able to meet the needs of the country and bring profits from the results of buying and selling transactions. International trade cannot be separated from price competition, quality is a determining factor for the competitiveness of a product. Therefore, it must be supported by government policies in exporting and importing. The success of this government policy depends on market response, meaning that if domestic prices are cheap it will result in an increase in the value of the country's exports. Meanwhile, the realization of imports is determined by the country's ability to finance its imports. The recent pressure on the exchange rate has again raised the question of whether a depreciation in real terms will have an impact on export performance and subsequently Indonesia's trade balance or net-exports. The exchange rate policy that will be formulated, of course, apart from maintaining price stability is also based on considerations of the impact of the exchange rate on Indonesia's international trade performance, which in turn will have an impact on GDP and inflation.

If a country's exchange rate is in a state of depreciation then its imports will decrease whereas if it is in a state of appreciation then its imports will increase. For this reason, it is necessary to look at the development of the domestic currency exchange rate against foreign currencies, especially the US Dollar, because the US Dollar is an international currency or reserve currency in line with America's rising position in the world economy, especially after World War I. The US Dollar was accepted by anyone as payment for the transaction (Boediono, 1993). The result was massive exploitation of the resources they owned. Yuliadi (2008) says there is a negative relationship between the Rupiah exchange rate against the US dollar and imports, meaning that an increase in the exchange rate will reduce imports. This occurred due to a decrease in the competitiveness of imported goods so that the value of imports decreased. The stability of the rupiah becomes increasingly crucial in relation to achieving the inflation target, given the impact of the exchange rate on inflation and inflation expectations which are quite large (Kurniati, et al, 2008).

The exchange rate of a currency or exchange rate is the exchange rate of a country's currency against other foreign countries (Thobarry, 2009). A more complete definition of the exchange rate is an exchange between two different currencies, which is a comparison of the value or price between the two currencies. This comparison of values is often referred to as the exchange rate. Exchange rates usually fluctuate, changes in exchange rates can take the form of depreciation and appreciation. The depreciation of the rupiah against the US dollar means a decrease in the price of the US dollar against the rupiah. While the appreciation of the rupiah against the US dollar is the increase in the rupiah against the USD (Anwary, 2011: 17) The exchange rate is based on two concepts, first, the nominal concept, is a concept to measure the difference in currency prices which states how much of a country's currency is needed to obtain a certain amount currency from another country. Second, the real concept used to

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measure the competitiveness of a country's export commodities in the international market.

Developing countries such as Indonesia have a low economic value of export products, but on the other hand they import products from developed countries at high prices. Under these conditions, the Indonesian state must balance with developed countries by increasing the volume of exports and increasing the exploitation of available resources. Export is trading by means of selling goods from within and influenced by several countries to other countries. Exports of a country include factors such as domestic prices for export destination countries, import prices for destination countries, per capita income of residents of export destination countries, tastes of the people of destination countries and exchange rates between countries. Changes in export volume to changes in the exchange rate, in this case the real exchange rate is positive, meaning that the real depreciation makes export domestic products relatively cheaper, thus stimulating (Krugman 2005:218).

LITERATURE REVIEW

If the relative price of foreign goods increases (REER increases) then the foreign community will divert spending to buy domestic goods, so that it will have a positive effect on exports. With an increase in the real exchange rate (depreciation), product prices on the global market will be cheaper, thereby increasing exports. The relationship between exports and the real exchange rate in the equation is:

Where :

EX $= (P, Y, REER)$

EX : Export volumes

P : Export prices

Y : Real income REER: Real exchange rate

The monetary crisis that hit Indonesia which began in mid-1997 resulted in inflation which caused the price of goods to tend to increase due to the limited number of goods produced. One of the relationships between exchange rates and interest rates can be seen from the interest rate parity theory. Interest Rate Parity Theory assumes that financial investment driven by differences in interest rates between countries will drive changes in exchange rates. Assuming perfect capital mobility, if the foreign interest rate is greater than the domestic interest rate, then the domestic currency will depreciate by the difference in these interest rates, and vice versa. In this case, exchange rate movements are driven by changes in financial transactions. When market forces force changes in interest rates and exchange rates in such a way, interest rate hedge arbitrage may no longer be exercised. In these conditions there is a balance called interest rate parity (interest rate parity).

METHODOLOGY

Data processing in this study, in analyzing data using Microsoft Ecxel 2007 software and then processed using E-Views 9.0. The analytical model used to identify the effect of international trade on exchange rates. Rupiah is an analysis model using quantitative methods. Multiple Regression Analysis using the Ordinary Least Square (OLS) method or the ordinary least squares method to obtain the coefficient of multiple regression lines. As the dependent variable in this study is the Rupiah exchange rate, and the independent variables are Exports, Imports, Exchange Rates, Inflation, Interest Rates. Model specifications to find out the variables that affect the Rupiah Exchange Rate during the years 2000 - 2016 used in this study are:

$NT = f(EKSPOR, IMPOR, KURS, INFLASI, SBUNGA)$

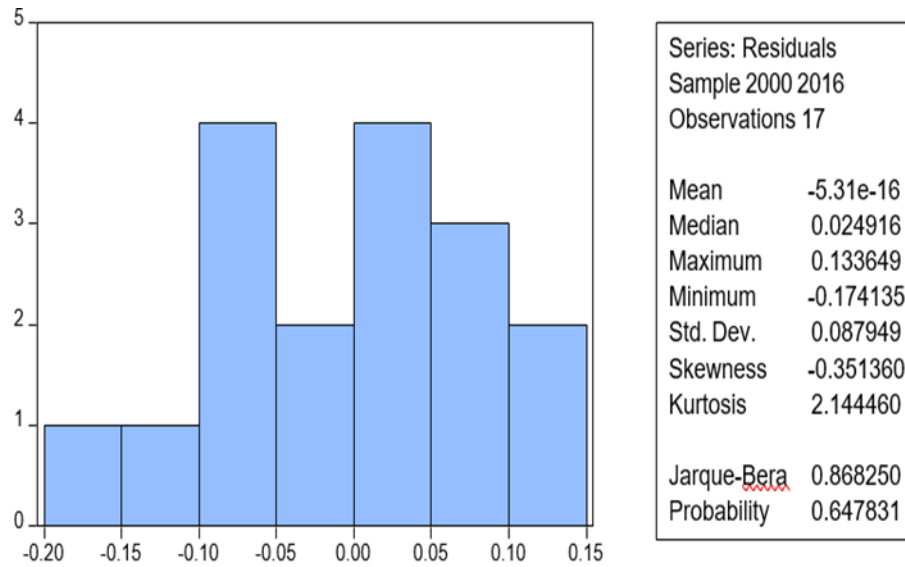Then the function is expressed in the relationship Y and X then,

$$NT = aEKSPOR\beta1\ e\beta2IMPOR+\beta3KURS+\beta4INFLASI+\beta4SBUNGA$$

Where:

NT	: Rupiah exchange rate
$ESKPOR$	: Export (Billion Rupiah)
$IMPOR$	: Import (Billion Rupiah)
$KURS$	: Exchange Rate (Rupiah)
$SBUNGA$	: Interest Rate (Percent)
Lk	: Logarithm
$\beta0$	: Intercept
$\beta1\beta2\beta3\beta4$	: Regression Coefficient
E	: Interrupt error (error term)
t	: time

RESEARCH RESULT AND DISCUSSION

The discussion of this analysis is based on data that has been officially published which has been formed and has been stated in the theoretical review and analysis model specifications, then an economic analysis will also be carried out which explains the meaning of the parameters obtained from the linear regression equation that has been carried out, then to see whether these parameters compatible with economic theory. The results of the Multiple Linear Regression (OLS) regression analysis of the estimation model used in this study are shown in the following table: The results of the normality test based on Figure 4.1 above show that the results of the JB-test with a probability number of 0.647831 are greater than α = 0.05, so Ho accepted. This means that the empirical model used has residual or error terms that are normally distributed. The results of the linear regression model equations generated from table 4.1 above are as follows : *LnNT* =11. 61153

Series: Residuals	
Sample 2000 2016	
Observations 17	
Mean	-5.31e-16
Median	0.024916
Maximum	0.133649
Minimum	-0.174135
Std. Dev.	0.087949
Skewness	-0.351360
Kurtosis	2.144460
Jarque-Bera	0.868250
Probability	0.647831

Gambar 4.1 Hasil Uji Histogram Jarque Bera

From table 4.1 below it can be explained that the results of estimating the value of the correlation matrix indicate that there are no data multicollinearity problems. Because the correlation coefficient between the independent variables does not exceed 10.

Table 1. White Test Table (Heteroscedasticity)

F-statistic	6.034961	Prob. F(13,3)	0.0824
Obs*R-squared	16.37388	Prob. Chi-Square(13)	0.2295
Scaled explained SS	4.668602	Prob. Chi-Square(13)	0.981

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.998846	6.927402	0.288542	0.7917
LNEKSPOR^2	-0.145440	0.110438	-1.316941	0.2794
LNEKSPOR*LNIMPOR	0.304599	0.265172	1.148684	0.3340
LNEKSPOR*LNINFLASI	0.251093	0.217862	1.152536	0.3326
LNEKSPOR*LSBUNGA	-0.159547	0.263425	-0.605663	0.5875
LNEKSPOR	-0.314127	0.974493	-0.322349	0.7683

LNIMPOR^2	-0.147751	0.126020	-1.172441	0.3256
LNIMPOR*LNINFLASI	-0.134010	0.143387	-0.934600	0.4189
LNIMPOR*LSBUNGA	0.062735	0.177836	0.352769	0.7476
LNINFLASI^2	-0.057424	0.058164	-0.987267	0.3963
LNINFLASI*LSBUNGA	0.219778	0.167014	1.315924	0.2797
LNINFLASI	-1.667681	1.038750	-1.605470	0.2067
LNSBUNGA^2	-0.189431	0.102939	-1.840229	0.1630
LNSBUNGA	1.546300	1.215478	1.272175	0.2930

R-squared	0.963170	Mean dependent var	0.007280
Adjusted R-squared	0.803571	S.D. dependent var	0.008028
S.E. of regression	0.003558	Akaike info criterion	-8.526817
Sumsquared resid	3.80E-05	Schwarz criterion	-7.840641
Log likelihood	86.47795	Hannan-Quinn criter.	-8.458610
F-statistic	6.034961	Durbin-Watson stat	1.933498
Prob(F-statistic)	0.082420		

Based on Table 1, the LM Test results show that the Obs*R-squared probability value is 0.1390, which is greater than α = 0.05. Thus the null hypothesis (Ho) cannot be rejected. This means that the estimated model does not contain partial correlations (autocorrelation) between confounding factors (error terms). The next step is testing the economic growth of each ASEAN member country. The results can be seen in the following table. Based on Table

4.4, the results of the White test show that the probability value of Obs*R-squared is 0.2295, which is greater than α = 0.05. So it can be concluded that in the model there is no heteroscedasticity problem.

Simultaneous Test Results (Test F)

Statistical test results obtained from the estimation results of the research model which can be seen in table 4.1, it can be seen that the F-statistical value is 5.973006 with a statistical probability of 0.006975 which is smaller than α = 0.05 which indicates that together (simultaneous test) all independent variables, namely exports, imports, inflation, and interest rates, have an influence on the Rupiah exchange rate.

Partial Test Results (t test)

The t (partial) test in this study was conducted to determine whether there is a significant influence between inflation (INF), exchange rates (NT), government spending (PP), and GDP on foreign direct investment (FDI). Through the t-test with each level of significance, the results of the estimation of the t-statistical value and probability of each variable can be seen in the following table:

Tabel 2. Hasil Uji Hipotesis Uji Parsial

Variable	Coefficient	t-Statistic	Prob.
LNEKSPOR	-1.160788	-2.659448	0.0208
LNIMPOR	0.928318	3.289738	0.0065
LNINFLASI	-0.134722	-1.509510	0.1570
LNSBUNGA	0.384148	2.270219	0.0424

The table above proves that the t-count value of the export variable t-stat= -2.659448, prob.= 0.0208, meaning that it can be statistically interpreted that the export variable has a significant effect on the Rupiah exchange rate. The import variable with t-stat= 3.289738 and prob.= 0.0065, means that it can be interpreted statistically that the import variable has a significant effect on the Rupiah exchange rate. The inflation variable with a t-stat= -1.509510 and prob.= 0.1570 means that it can be interpreted statistically that the inflation variable has no significant effect on the Rupiah exchange rate. The interest rate variable with a t-stat= 2.270219 and prob.= 0.0424 means that it can be interpreted statistically that the interest rate variable has a significant effect on the Rupiah exchange rate.

Result Coefficient of Determination (R2)

Based on table 4.1 the empirical results show that the model has coefficient of determination of 0.665664. These results can explain that variations in exports, imports, inflation, and interest rates can explain the rupiah exchange rate by 66.56% while the remaining 33.44% is explained by other variables not examined in this study.

The Effect of Exports and Imports on Exchange Rates

Akbostanci (2002) studied the existence of the J curve in the Turkish economy. The study period is from 1987-2000, using quarterly data. In his study, Akbostanci uses the Error Correction Model (ECM) to distinguish the reaction of the trade balance to changes in the real exchange rate in the short term and the long term. To prove the existence of the J-curve, the researcher uses a generalized impulse response methodology. The results of the analysis show that there is a relationship between the trade balance and the real exchange rate of the Turkish currency, both in the short and long term perspectives.

Effect of Inflation on the Exchange Rate

Indonesia's inflation data for the 2000-2016 period is included in the mild inflation category, so people are not interested in buying goods from abroad. The increase in domestic goods was not significant to make people switch to importing domestic goods from other countries, so that the rupiah exchange rate did not weaken significantly. Inflation did not have a significant effect on the rupiah exchange rate for the 2000-2016 period because when inflation hit Indonesia it was classified as mild inflation. The results of this study are in line with research (Noor, 2011) entitled the effect of inflation, interest rates, and the amount of money in circulation on the rupiah exchange rate against the US dollar and to determine the causal relationship. This study analyzes all independent variables, namely inflation, interest rates, and the amount of money in circulation to changes in the rupiah exchange rate against the US dollar and to determine the causal relationship.

The results of the study (Triyono, 2008: 159) succeeded in proving the effect of inflation on movement. Based on the results of the regression shows that inflation has a negative effect. This means that an increase in the value of inflation will reduce the movement of the rupiah. The effect of inflation on the movement of the rupiah due to the sudden increase in inflation, also allows the reduction of the national export capacity of the country concerned, which will reduce the supply of foreign exchange in the country. High inflation also encourages people to withdraw funds from bank deposits to invest in the US dollar exchange rate, which can reduce the supply of foreign exchange.

The Effect of Interest Rates on the Rupiah Exchange Rate

The effect of interest rates on the rupiah exchange rate is in accordance with the hypothesis that is expected to have a positive and significant effect. This is because if Indonesia's domestic interest rate increases, capital inflow will occur (including those from America). This condition means that there will be a release of trading partner exchange rates (in this case dollars) to get rupiah. The increase in interest rates that occur in Indonesia will encourage the transfer of funds or financial instruments from currencies with low interest rates (in this case the dollar) to currencies with high interest rates (in this case the rupiah). So that currencies that have low interest rates (dollars) compared to countries that experience high interest rates (rupiah) will experience depreciation. The results of this research support research conducted by Triyono (2008), Yudha and Hadi

(2008) who succeeded in showing the effect of interest rates on the movement of the rupiah against the US dollar.

In this case the nominal interest rate is not an accurate measurement tool, because it still contains an element of inflation. The results of the study (Atmadja, 2002:71), show that there is an influence of interest rates on the movement of the rupiah exchange rate, with a positive influence. This means that any increase in bank interest rates in Indonesia will increase the movement of the rupiah exchange rate. Interest rates have an effect on the movement of the rupiah because when domestic interest rates increase while foreign interest rates remain constant, the interest of investors to invest in the country is higher because the returns obtained are also expected to be higher so that capital inflows will increase. The demand for domestic currency increases so that it will be responded by strengthening the domestic currency (Rusniar, 2009).

CONCLUSIONS AND RECOMMENDATIONS

Based on the estimation results of the effect of international trade on the Rupiah exchange rate using the OLS (Ordinary Least Square) method through a multiple linear regression estimation model regarding the effect of independent variables such as exports, imports, inflation, and interest rates in 2000-2016, it can be concluded that: the estimated results of the coefficient of the effect of international trade on the Rupiah exchange rate can be explained by the variables of exports, imports, inflation, and interest rates. The magnitude of the coefficient values of the variables that explain the Rupiah exchange rate variable, the largest are the variables of imports and exports. So it can be concluded that: investors and the government pay more attention to the productivity of exported and imported goods to offset the fluctuation of the Rupiah exchange rate against the US Dollar. And the policy on interest rates also affected market prices.

ADVANCED RESEARCH

Therefore, it must be supported by government policies in exporting and importing. The success of this government policy depends on market response, meaning that if domestic prices are cheap it will result in an increase in the value of the country's exports. Meanwhile, the realization of imports is determined by the country's ability to finance its imports. The recent pressure on the exchange rate has again raised the question of whether a depreciation in real terms will have an impact on export performance and subsequently Indonesia's trade balance or net-exports.

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