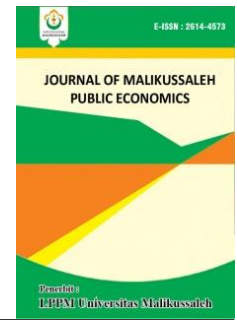# ANALYSIS OF FOREIGN DEBT IN INDONESIA

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A R T I C L E I N F O R M A T I O N   **A B S T R A C T**

This study aims to determine the short run and long-run effects of foreign exchange reserves, exports, and the dollar exchange rate on the foreign debts of Indonesia. This study uses time-series data during 1994-2020. The study employs the Autoregressive Distributed Lag (ARDL) approach with the help of Eviews 9. The results in the short-run equation model showed that the foreign exchange reserve had a positive and significant effect on the foreign debts of Indonesia, while exports and the exchange rate dollar has a positive but insignificant effect on the foreign debts of Indonesia. In the long run, the foreign exchange reserves and exports has a negative and insignificant effect on the foreign debts of Indonesia, while the dollar exchange rate has a positive but insignificant effect on Indonesia's foreign debt.

I. INTRODUCTION

Indonesia is a developing country, which has limited capital within the country as sofar triggers foreign debt. Therefore foreign debt becomes one of the alternatives taken by the government to cover the country's savings shortage. Foreign debt is needed to finance the construction of development projects and to improve the welfare of the community (Tambunan, 2008).

The development of external debt, foreign exchange reserves (CDV), exports and exchange rates in Indonesia in 2017-2019 can be seen in Table 1 as follows.

Table 1
Data on Foreign Exchange Reserves (CDV), Exports, Dollar table 1 Exchange Rates and External Debt in Indonesia

Year	Foreing exchange reserces(Juta,USD)	Ekspor (Juta USD)	Value of Rupiah/USD	Foreing debit (Juta,USD)
2015	105.931,00	142.694,5	13.795,00	310.730,00
2016	116.362,00	135.652,8	13.436,00	320.006,00
2017	130.196,00	156.985,5	13.548,00	352.878,00
2018	120.654,00	188.711,2	14.710,00	360.532,00
2019	129.183,00	170.727,4	13.901,00	389.337,00
2020	135.897,00	163.306,50	14.050,00	417.527,00

Source: Bank Indonesia and BPS Indonesia (2020)

Based on table 1 above, it shows that the Indonesia's forign increases every year. In the year 2015 to 2016, itincreases 9,27 milliar USD. The it increases surplus in the year 2017 about 32,8 million USD , the increase of indonesi's foreign debt is caused by some indicators such as eksports, foreigh exchge reserves dollar exchge rate.

From the side of exports. It decreases shoutly   in the year 2016 of about -7,o4 milliar USD. This Will lead to decrese the amoung of foreign exchge reserves. But , what we see from the table 1 above the situasion is antagonis where the foreign exchge reserves increase to 10,43 milliar USD.

If exchge rate streghter, the export usually decreases because goods of exports are stuted to be expensive. This will lead to decrease exports and in turn decreases foreign exchge reserves. This the foreign debt of curse it shold be stable ,

but from the table 1 about we can see that the foreign debt increases 10,43 milliar in the same year.

The aim of this study is to determine the short-run & log-run relationship between. Exports, foreign exchge resrves, dollar exchge rate and Indonesia foreign debt.

The study will proceed to literature riview in part to. After completing, the study will present researd method. Results and discousen will be shown VI those as the cloasing pat will be drawn conclution and sajustion.

2. THEORETICAL STUDY

Foreign Debt

Foreign debt is a portion of a country's total debt obtained from creditors outside that country. This form of debt can be in the form money obtained from private banks, other countries' governments or international financial institutions such as the IMF and the World Bank (Ulfa & Zulham, 2017). Foreign debt or foreign loan is any state receipt either in the form of foreign exchange or in the form of goods or in the form of services obtained from foreign lenders that must be paid back on a certain times (Tibroto, 2001). Foreign debt is an aid from developed countries to fill the resource gap in the macroeconomics of developing countries so that debtor countries that have the potential to invest large amounts of development projects in developing countries (Sobhan, 2002).

Foreign Exchange Reserves

Foreign exchange reserves are part of national savings so the greatnessor smallness of foreign exchange reserves is a signal to global financial Meanwhile, the adequacy of foreign exchange reserves is determined by the large needs of imports and the exchange rate system uses. In a freely inflated exchange rate system, the function of foreign exchange reserves is to maintain monetary stability limited to actions to reduce exchange rate fluctuations that are too sharp. Therefore in the floating exchge rate system, the foreign exchange reserves do not need to be as large as the foreign exchange reserves needed if the country adopts a fixed exchange rate.

Exports

Export is the sale of goods or services abroad with applicable government provisions such as payment system, quality, quantity and other applicable terms of sale that have been approved by exporters and importers. Export demand is the amount of goods or services needed to be exported from one country to another (Sukirno, 2010). The export process is basically the act of removing goods or commodities abroad. Exports are international trade that can provide stimulus domestic demand which then leads to the growth of large factory industries, along with stable political structure and flexible social institutions (Todaro, 2004).

Dollar Exchange Rate

The exchange rate in question is the price level of the currency exchange rate between two Countries. The value of exchange rate is based on the agreement of the currency used by the people in those country who trade with each other (Mankiw, 2007).

Exchange rate is the price of the currency of a country that is said in another currency that shows the amount of rupiah value to be paid for a unit of foreign currency, and how much rupiah a person must spend when going to sell or buy foreign currency (Triyono, 2008).

In this study there are 2 variables, namely dependent variables and independent variables. Dependent variables are influenced by other variables. Dependent variable in this study is foreign debt (Y). The independent variables of this study are foreign exchange reserves $(X1)$, Exports $(X2)$ and Exchange Rates $(X3)$.

Research Hypothesis

A hypothesis is a temporary answer to a research problem. So the hypothesis is a basic assumption made freely but logically, which is the temporary answer to the research problem (Arikunto, 2010). The hypotheses in this study are:

H1 : Foreign exchange reserves have a short run and long-run influence on Indonesia's foreign debt

H2 : Exports have a short-run and long-run influence on Indonesia's foreign debt.

H3 : dollar exchange rates have short-run and long-run influences on foreign debt

3. RESEARCH METHODS

Data and Source of Data

This study uses data of quantitative data 24 observations, from 1994-2020, while the data used by researcher is The foreign debt exchange reseves, exports, imports,and exchange rate for the paroid 1994-2020 is obtuited from the Central

Statistics Agency (BPS) of the Republic of Indonesia.

Definition of Operational Variable

The dependent variable in this study is Indonesia's foreign debt which measueal by using units of dollar the period 1994-2020. The independent variables in the study are:

a. Foreign Exchange Reserves, which are foreign currency which are deposited by central banks and monetary authorities. It is measure by using dollar units from 1994-2020.

b. Export, namely the sale of goods from domestic to abroad. It is measure by using units of dollars from 1994-2020.

c. Exchange rate, is the change of the exchange rate of the US dollar against the rupiah. It is measure by using rupiah units from 1994-2020.

Data analysis method

To look at the effect of foreign exchange reserves, exports and dollar exchange rates on foreign debt from 1994-2020, it is analyzed by using the ARDL (Autoregressive Distributed Lag) model. The ARDL model is a combination of AR (Auto Regressive) and DL (Distributed Lag) models. An AR model is a model that uses one or more past data from dependent variables. While the DL model is a regression model involving data on the present and past times (lagged) from dependent variables (Gujarati & Porter, 2009). In this study, the author uses the ARDL model where it can be interpreted as a model that uses data time series in the past and present consisting of independent variables and a dependent variable.

Stationer Test

The unit root test is performed to determine whether or not a variable is found as stationer. Data is said to be stationer if the data is close to the average. This study uses ADF (Augemented Dickey Fuller) analissas a tool to look stationarity. If in this test shows a statistical ADF value greater than mackinnon Critical Value, this means that then the data is not stationer.

Lag Optimum Test

The second stage in ARDL analysis is the determination of optimum lag. The determination of the amount of lag in the ARDL model is determined in the recommended information criteria by the smallest values of final Prediction Error (FPE), Akaike Information Criterion (AIC), Shwarz Criteria (SC), and Hannan-Quinn (HQ). It is usually signed by asterisk. The Eviews program has gives asterisk that is designated as optimum lag.

Granger Causality Test

The method used to analyze causality relationships between observed variables is using granger causality test. In general, a granger equation can be interpreted as follows:

1. Unindirectional causality from dependent variable to independent variable. Happens when that the lag coefficient of dependent variables is statistically significant different from zero, while the coeffesien lag of all independent variables is equal to zero.

2. Bilateral causality occurs when the lag coefficient of all variables, both a dependent variable and independent variables are statistically significant different from zero.

3. Independence exists where the lag coefficient of all variables, both dependent and statisticly independent variables are not different from zero.

Cointegration Bound Test

The cointegration test serves to see if there is a long-term relationship between a independent variable and a dependent variable. The bound test is conducted to test for the presence of long-run association in the selected ARDL model. The results of the bound test will focus more on the F-statistic. The F-statistic will be compared to the critical value at 5%. If the value of F-statistic is greater than the value of upper bounds and lower bound, the cointegration exist between independent variables to dependent variable. While if the value of F-statistic is smaller than the value of upper bounds and lower bound then it is not variable integrated between free variables with bounds (Zaretta & Yovita, 2019).

Autoregressive Distributed Lag (ARDL) Model

The study uses the specifications of the Autoregressivee Distributed Lag (ARDL) model. The ARDL model is chosen because it is able to see the influence of X and Y over time, as well as the influence of previous Y variables on current Y. (Zaretta & Yovita, 2019).

Stability ARDL Test

The ARDL model stability test in this study useS the CUSUM test with a 95% confidence level. Cusum test results for the ARDL model in this study where often calls the stability of the model is determined from the position of the cusum line. It is blue between two 5% significance lines that are red. For ARDL CUSUM line models are among the significance lines that prove that the ARDL model is stable.

4. RESEARCH RESULTS AND DISCUSSION

Stationerity Test Result

Unit Root Test results based on the Augented Dickey-Fuller test.

Table 2
Unit Root Test Using Augemented Didkey-Fuller (ADF)

Variabel	Unit Root	ADF test Satistic	Critical Value 5%	Prob ADF	Keterangan
ULN	Level	0.225127	-3.595026	0.9969	Tidak
	First Diff	-3.851890	-3.603202	**0.0303**	Stasioner
	Second Diff	-7.899329	-3.612199	**0.0000**	Stasioner
CDV	Level	-2.208280	-3.595026	0.4657	Tidak
	First Diff	-4.861355	-3.603202	**0.0034**	Stasioner
	Second Diff	-5.709964	-3.622033	**0.0006**	Stasioner
Ekspor	Level	-1.973718	-3.595026	0.5878	Tidak
	First Diff	-4.585543	-3.603202	**0.0063**	Stasioner
	Second Diff	-7.436395	-3.612199	**0.0000**	Stasioner
Kurs	Level	-2.254596	-3.595026	0.4421	Tidak
	First Diff	-4.832786	-3.603202	**0.0036**	Stasioner
	Second Diff	-6.443439	-3.622033	**0.0001**	Stasioner

Source: (data processed 2021)

Based on Table 2, there are no stationary variables at the level. Therefore it is necessary to do the process of 1s tdifference. Where the probability value is smaller than 0.05 (prob < 0.05).

Optimum Lag Determination Results

Based on the results of the optimum lag test that has been done on the variables in the study, the minimum AIC value is in lag 2, as stated in table 3:

Table 3.
Optimum Lag Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1102.326	NA	3.22e+33	88.50607	88.70109	88.56016
1	**-983.4085**	**190.2678***	**8.74e+29***	**80.27268***	**81.24778***	**80.54313***
2	-976.5080	8.832673	2.03e+30	81.00064	82.75582	81.48745

Source: (processed data 2021)

Based on Table 3 can be seen the results of the lag test it shows that with the criteria FPE, SIC, SC and HQ the recommended candidate is lag 1. Appears the reason can be seen from the most asterisk. Thus, the recommended optimal lag is lag 1. Thus it can be concluded that lag 1 is determined as the optimal lag to be used in the estimation of the general equation of ARDL in this study.

Granger Causality Test Results

The Granger Causality test is intended to find out whether there are reciprocal relationships (Masta, 2014). Then as a reference of the determination of variables bound in research. Here are the results of the Granger Causality Test in table 4:

Table 4
Granger Causality Test Results

Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
CDV does not Granger Cause ULN	26	5.05009	**0.0345**
ULN does not Granger Cause CDV		0.05633	0.8145
EKSPOR does not Granger Cause ULN	26	9.61774	**0.0050**
ULN does not Granger Cause EKSPOR		0.00733	0.9325
KURS does not Granger Cause ULN	26	1.27364	0.2707
ULN does not Granger Cause KURS		3.79752	0.0636
EKSPOR does not Granger Cause CDV	26	0.19889	0.6598
CDV does not Granger Cause EKSPOR		8.04481	**0.0094**
KURS does not Granger Cause CDV	26	0.96906	0.3352
CDV does not Granger Cause KURS		4.27264	0.0502
KURS does not Granger Cause EKSPOR	26	0.05292	0.8201
EKSPOR does not Granger Cause KURS		1.79148	0.1938

Source: (processed data 2021)

From the table 4 above, it can be interpreted that between the various variables of the studiey do not have a reciprocal relationship then the four variables accept the H1 hypothesis, we can see to the value of probability is greather than $\alpha = 0,05$

Cointegration Test Result

The cointegration test is conducted to see if there is a long-run or short-run relationship and possible imbalances. With an imbalance, here are the results of Johansen's cointegration test in table 5:

Table 5
Johansen's Kointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.637326	67.96697	63.87610	0.0218
At most 1	0.596620	42.61068	42.91525	0.0536
At most 2	0.387276	19.91374	25.87211	0.2303
At most 3	0.264135	7.667707	12.51798	0.2800
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.637326	25.35629	32.11832	0.2661
At most 1	0.596620	22.69693	25.82321	0.1227
At most 2	0.387276	12.24604	19.38704	0.3926
At most 3	0.264135	7.667707	12.51798	0.2800

Source: (processed data 2021)

Based on Table 5 the results of the cointegration test can be seen that there is only a variable that occur,s cointegration is indicated by a trace statistical value greater than the critical value of $67.96697 > 63.87610$. This indicates that there is no significant cointegration in the $\alpha = 5\%$. Whereas if we look at the Max-Eigen statistical value of 25.35629 smaller than the critical value of 32.11832. It shows the absence of cointegration. Therefore, the bound test needs to be done.

Bound Test Results

The results of the cointegration test using the bound test approach can be found in Tabel 6.

Table 6
Bound Test Results

Test Statistic	Value	K	
F-statistic	12.62382		3
Critical Value Bounds			
Significance	I0 Bound	I1 Bound	
10%	2.37		3.2
5%	2.79		3.67
2.5%	3.15		4.08
1%	3.65		4.66

Source: (processed data 2021)

Based on table 6 above, the cointegration test results based on the Bound test approach. It show a statistical F-value of 12.62382, which means the value of F-statistics is greater than the value of Bound test at both the significance level of 10%, 5%, 2.5% and 1%. It can be concluded that there is cointegration in the variables in the model tested, so that there is a short-term and long-term balance in those variables because the F statistic

is found greater than and the upper bound value of all variabels.

ARDL Model Estimates

The ARDL (Autoregressive Distributed Lag) model is a dynamic model that can see the influence of variables X and Y over time, in other words we can see long-term and short-term relationships of all variabels in this study.

Table 7
Short-Term Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ULN(-1)	1.034522	0.064616	16.01031	0.0000
CDV	0.672049	0.192145	3.497609	0.0024
CDV(-1)	-0.558026	0.309366	-1.803772	0.0871
EKSPOR	0.098786	0.117135	0.843348	0.4095
KURS_DOLLAR	0.204591	1.561045	0.131060	0.8971
KURS_DOLLAR(-1)	-2.126816	1.417816	-1.500064	0.1500
C	2623.831	8852.677	0.296388	0.7701

Source: (processed data 2021)

The results of the above tests can be concluded that in the short foreign exchange reserves have a positive and significant effect on foreign debt, indicated by a probability value of $0.0024 < 0.05$. Exports and the dollar exchge rate have a positive but insignificant effect on foreign debt with a probability of $0.4095 > 0.05$ and $0.8971 > 0.05$.

Table 8
Long-term test

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CDV	-3.302925	14.39330	-0.229477	0.8210
EKSPOR	-2.861546	3.731613	-0.766839	0.4526
KURS_DOLLAR	55.68158	112.9954	0.492778	0.6278
C	-76005.16	374651.5	-0.202869	0.8414

Source: (processed data 2021)

Model Stability Testing Result

In structural stability testing, the model can be distinguished from two, CUSUM (Cumulative Sum of Recursive Residual) and CUSUMQ (Cumulative Sum of Square of Recursive Residual). The following are the results of CUSUM testing with a foreign exchange reserve variables as dependent variables.
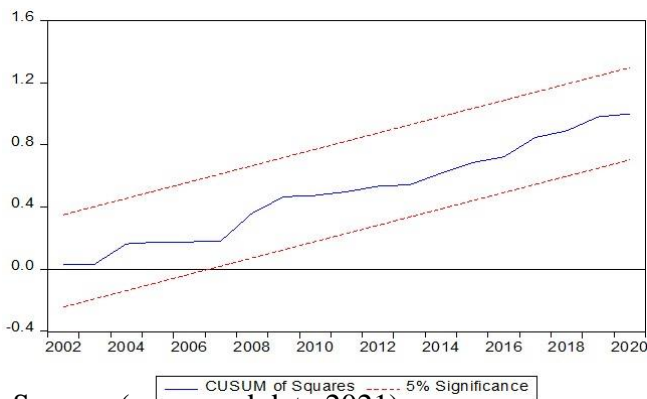
CUSUM Test
Results
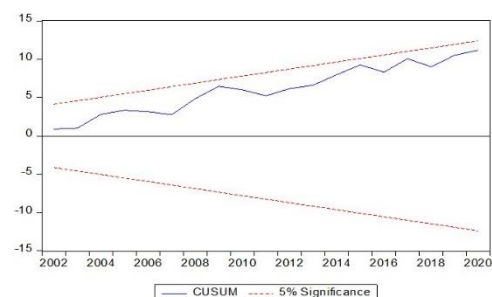
Source: (processed data 2021)

The cusum test results can be explained that the plot quantity Wr is not above the limit line at a significant rate of 5%, the plot forms a linear line.

CUSUMQ Test Results

Source: (processed data 2021)

The results of cusumq testing can be explained that the sr quantity plot is not above the limit line at a significant rate of 5%. The plot forms a linear line. Based on the results of the two stability tests of the above model can be concluded the regression results coefficient is stable.

DISCUSSION
Short-Run Balance Relationship Between Variable

Based on the results of tests that have been conducted, it can be concluded that the variable of foreign exchange reserves in the short run have a positive and significant effect on Indonesia's foreign debt. This means that every increase in foreign exchange reserves of 1 million USD has an effect on the increase of Indonesia's foreign debt by 0.672049 million USD. This is supported by Satrianto research (2016), If foreign exchange reserves increase, foreign debt will increase because. If the government has strong foreign exchange reserves, it can sustain foreign debt as state financing because of another function of foreign exchange reserves, namely to pay state financing.

Export variables in the short run have a positive but insignificant effect on Indonesia's foreign debt. This means that every increase in exports of 1 million USD in the short run then foreign debt increases by 0.098786 million USD. Filisia (2019), The amount of foreign debt payments made by the government depends on state revenues from exports. In general, the share of export proceeds for foreign debt payments ranges from 15-17 percent. Dahlly (2017), surplus means that there is no current account deficit that can cause higher foreign debt.

dollar exchange rates in the short run have a positive but insignificant effect on Indonesia's foreign debt. This means that every increase in the dollar rate of 1 rupiah in the short run then foreign debt increases by 0.204591 million USD. This is supported by Tafonao research (2016), the value of the exchange rate greatly affects the economic conditions, the exchange rate has a positive effect means that the rupiah exchange rate relative to the dollar increases so that foreign debt will follow suit.

Long-Run Balance Relationship Between Variable

Based on the results of tests that have been conducted, it can be concluded that the foreign exchange reserves in the long run have a negative but insignificant effect on Indonesia's foreign debt. This means that every increase in foreign exchange reserves of 1 million USD has an effect on the decrease in Indonesia's foreign debt by -3.302925 million USD. Kuswantoro (2017), Foreign debt initially adds to foreign exchange reserves, but any foreign loans received by Indonesia will add to the accumulation of debt, and in turn the accumulation of such debt must be paid.

Export variables in the long term have a negative but insignificant effect on Indonesia's foreign debt. This means that every increase in exports of 1 million USD in the short run then foreign debt decreases by -2.861546 million USD. Dahlly (2017), When exports increase then foreign debt decreases, which is in the study is not significant so it is not assumed if exports then foreign debt also increase exchge.

Dollar rates in the long run have a positive but insignificant effect on Indonesia's foreign debt. This means that every increase in the dollar rate of 1 rupiah in the short term then foreign debt increases by 55.68158 million USD. This is supported by ibrahim's research, at all (2019), If there is turmoil depreciating the rupiah exchange rate where the country makes foreign loans will cause the addition of foreign debt, because the value of the loan is calculated by exchange asaing, while, having a foreign loan will cause to increase the burden of foreign debt, because the repayment of principal installments and interest on loans is calculated with the borrower's country currency. So if the rupiah exchange rate appreciates against the U.S. dollar, then the

reduction in loans will always be followed by the exchange rate of the currency value.

CONCLUSION AND SUGGESTION
Conclusion

Based on the results of the research conducted, this study can draw the following conclusions:

1. In the short-run equation model, it is known that foreign exchange reserve variables have a positive and significant correlation to Indonesia's foreign debt and the long-run the variable of foreign exchange reserves has a negative but insignificant effect on Indonesia's foreign debt.

2. In the short-run equation model, it is known that export variables have a positive but insignificant correlation to Indonesia's foreign debt and the long-run export variables have a negative. but not significant effect on Indonesia's foreign debt.

3. In the short-term and long-run the dollar exchge rate variables have a positive but not significant correlation to Indonesia's foreign debt.

Suggestion

There are several suggestions that can be given, as follows:

1. It is advisable to take a longer time and add other variables, in order to provide more relevant results to Indonesia's foreign debt.

2. For the they , hopefully through this research can find out about the problems of long-run and short-run relationships between foreign exchange reserves, exports and dollar exchange rates against Indonesia's foreign debt

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