

THE EFFECT OF FOREIGN EXCHANGE RESERVES, EXCHANGE RATES AND LIBOR INTEREST RATE ON FOREIGN DEBT

Abstract

Foreign debt is one of the alternative incomes or sources of domestic capital financing to cover the lack of development capital. The purpose of this research is to assess the short-term and long-term impact of foreign exchange reserves, the rupiah exchange rate, and foreign interest rate on Indonesia's foreign debt from 2008 to 2020. The results of VECM model show that foreign exchange reserves have a positive and significant effect on foreign debt in the short term, but a negative and significant effect on foreign debt in the long run. The rupiah exchange rate has no influence on foreign debt in the near term, but it has a negative and considerable effect in the long term. Then, in the short and long run, foreign interest rate has no influence on Indonesia's foreign debt. Hence, the government is expected to take appropriate policy steps to lessen its reliance on foreign debt. One of them is to optimize the use of foreign debt for productive purposes, so increasing foreign exchange reserves while decreasing the amount of debt borrowed.

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1. Introduction

Economic development is one of the most important things that every country, including developing countries, must do. On the scale of developing countries, such as Indonesia, it requires a lot of capital because it has to catch up in various aspects, especially from the economic aspect by carrying out development in the economic sector. Indonesia needs considerable financing to build an equitable economy. With Indonesia's current finances, it is not possible to use it fully for this financing and to cover it requires additional injections from developed countries in the form of foreign debt (Harjanto, 2015).

Foreign debt is one of the alternative incomes or sources of domestic capital financing to cover the lack of development capital and is still in a safe capacity (Fadillah & Sutjipto, 2018). Yudiantmaja (2012) stated that Indonesia is one of the countries that rely on foreign aid for development financing. Foreign aid plays a very important role in the efforts of the country concerned to reduce its main obstacle, namely the shortage of foreign exchange and to increase a country's economic growth.

Furthermore, among several macroeconomic indicators, foreign exchange reserves are one of the indicators that can affect the position of foreign debt (Saputro & Soelistyo, 2017). Foreign exchange reserves are assets held on reserve and usually used to finance imports and pay foreign liabilities. However, when foreign exchange reserves are used continuously to pay installments and interest on foreign loans, it can erode foreign exchange reserves, which will have a negative impact on funding sources for Indonesia's economic development. According to Erwina et al., (2018) foreign exchange is funding payment for economic activities. In other words, foreign exchange reserves are an important indicator in order to achieve monetary and macroeconomic stability in Indonesia, which is used to finance imports, development, foreign obligations and maintain rupiah exchange rate stability.

In addition to foreign exchange reserves, exchange rates can also affect foreign debt. According to Tille (2003), the exchange rate has an important role in the movement of foreign loan positions, fluctuating exchange rate movements have a significant impact on a country's foreign loan position. Widharma et al., (2013) stated that if the rupiah exchange rate appreciates against the US dollar, it will be followed by a reduction in debt or loans against the rupiah exchange rate, and vice versa the depreciation of the rupiah exchange rate will cause the amount of foreign debt to increase due to Indonesia making foreign debt payments using foreign currencies. To see the development of Indonesia's foreign exchange reserves, exchange rate, and external debt, (figure 1):

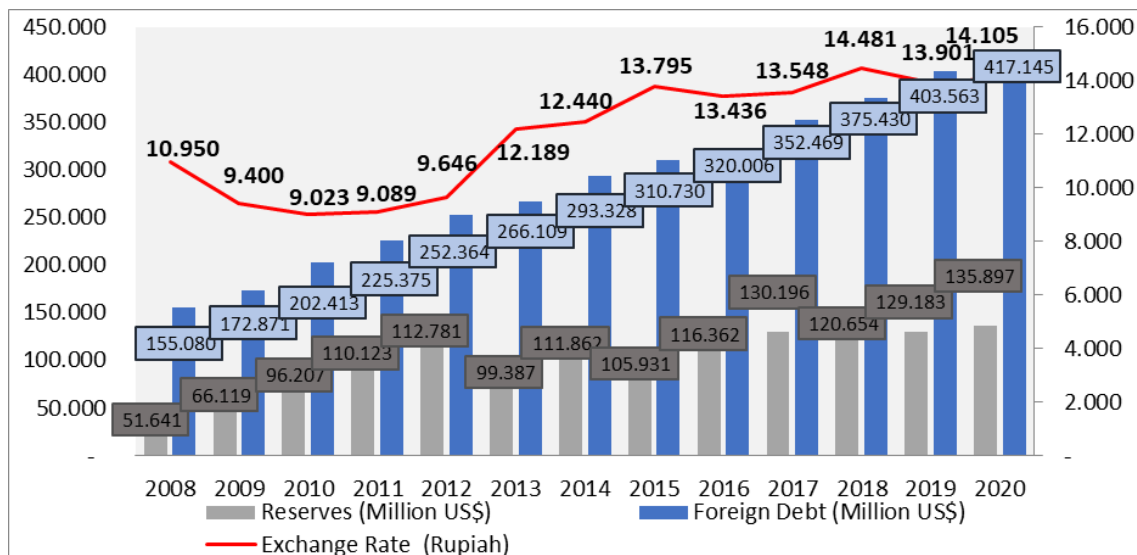


Figure 1. Development of Foreign Exchange Reserves, Rupiah Exchange Rate and Indonesia's External Debt in 2008-2020

Source: Bank Indonesia (BI) and CEICDATA (data processed)

Based on the chart, external debt from 2008 to 2020 continued to increase, while foreign exchange reserves and the rupiah exchange rate fluctuated. As in 2013, foreign exchange reserves fell to US \$ 99,387 million, whereas in 2008-2012 foreign exchange reserves continued to increase. Likewise, the rupiah exchange rate increased (weakened) in 2008 and decreased (strengthened) in 2009-2010. However, foreign debt actually increased. Then, in 2014 foreign exchange reserves increased again followed by an increase in foreign debt from US \$ 266,109 million to US \$ 293,328 million. The increase in foreign exchange reserves was influenced by the withdrawal of foreign loans so that foreign exchange reserves increased and foreign debt also increased.

In the following year, foreign exchange reserves continued to fluctuate until in 2018 foreign exchange reserves again decreased by US \$ 9,542 million. In the same year, the rupiah exchange rate was at its highest during the period 2008 to 2020 of Rp 14,481. This means that the rupiah exchange rate is weakening against the US dollar. The decline in foreign exchange reserves triggered by maturing government external debt payments and accompanied by an increase in the rupiah exchange rate caused the amount of foreign debt to increase by US \$ 375,430 million. The increase in external debt continued until 2020 with the highest value of US\$ 417,145 million, followed by an increase in foreign exchange reserves of US\$ 135,897 million, and a stronger rupiah exchange rate against the dollar of Rp 14,105.

In addition to foreign exchange reserves and exchange rates, foreign debt is also affected by (London Interbank Offered Rate (LIBOR)). Indonesia's difficulty in financing state expenditure is accompanied by foreign debt that increases every year due to changes in the LIBOR interest rate.

The LIBOR interest rate is a benchmark for paying interest installments on lent debts and also a benchmark for decisions to re-loan (Saputra et al., 2018). Based on demand theory, foreign debt is also determined by interest rates in international money markets, namely LIBOR where when the LIBOR interest rate increases, it will affect the demand for foreign debt (Tambunan, 2008). In summary, the development of the LIBOR interest rate can be seen in figure 2 below:

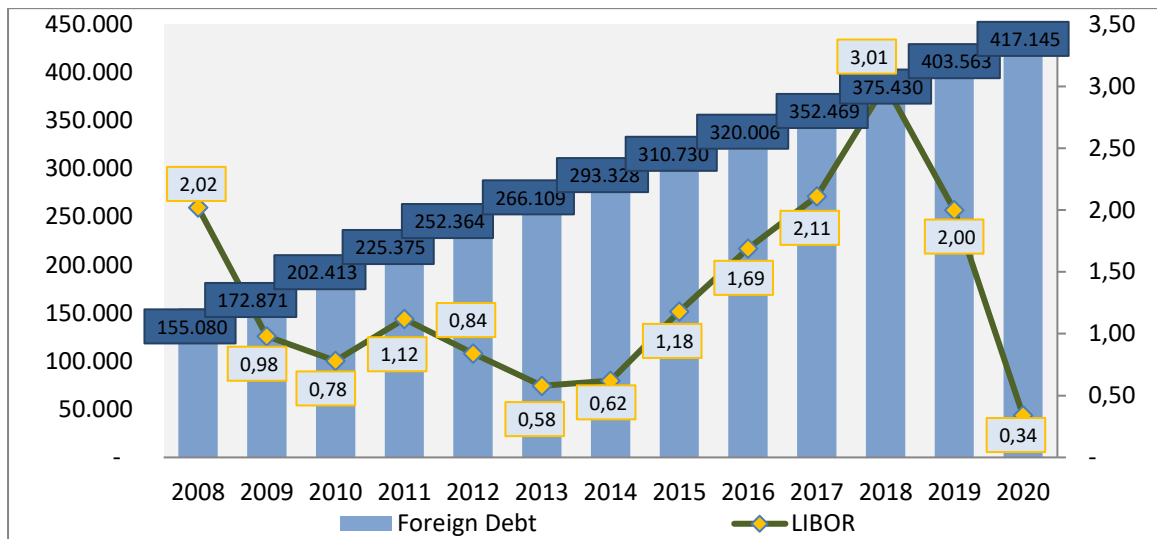


Figure 2. Development of LIBOR Interest Rate and Indonesia's External Debt in 2008-2020

Source: Bank Indonesia (BI) and Mortgage Indexes (data processed)

The figure shows that the LIBOR interest rate in the period 2008-2020 fluctuated greatly, as in 2008 and 2018 foreign interest rates were at the highest with 2.02 percent and 3.01 percent respectively. The average interest rate reduction occurred from 2009-2013 and after that interest rates increased, until in 2019 and 2020 interest rates experienced a fairly extreme decline.

Based on the phenomena described above, Indonesia has a high dependence on foreign debt and continues to increase every year. Foreign debt can not only provide solutions but can also cause problems in the long run, such as debt payments along with interest that has matured and of course draining foreign exchange reserves. Especially when the rupiah exchange rate fluctuates in a weak direction, foreign exchange reserves continue to drain because the amount of debt to be paid increases.

According to explanations and theories that have been presented and hypotheses in this study, there are several previous research results that are in accordance with this statement, such as research by Aniyati (2019) in the long-term foreign exchange reserves and LIBOR have a negative and significant effect. In the short term, foreign exchange reserves have a positive and significant effect, but LIBOR does not have a significant effect on foreign debt, while the rupiah exchange rate, whether long or short term, has a significant effect on foreign debt. Similarly, Kenedy et al.,

(2020) stated that in the long run, foreign exchange reserves have a negative and significant effect on foreign debt. Jannah & Shidiqi (2017) also produced the same research results that exchange rates can affect foreign debt and its movement moves negatively. However, in contrast to the results of research by Wahyuni et al., (2019) which states that foreign exchange reserves do not have a significant effect on foreign debt. Ratag et al., (2018) also stated that the exchange rate has no influence on foreign debt. Saputra et al., (2018) also stated that LIBOR is not significant to foreign debt.

2. Literature Review

According to Bank Indonesia, foreign debt is any state revenue either in the form of foreign exchange and/or foreign exchange denominated in rupiah, or in the form of goods or services obtained from foreign lenders that must be repaid under certain conditions. Foreign debt is divided into government external debt, central bank external debt and private external debt. Government external debt is debt owned by the central government, consisting of bilateral, multilateral debt, export credit facilities, commercial and leasing debt, and Government Securities (SBN) issued abroad and domestically owned by non-residents. Central bank external debt is debt owned by Indonesian Central Bank to support the country's balance of payments and foreign exchange reserves. Meanwhile, private foreign debt, namely foreign debt of residents other than the government and central bank to non-residents in the form of foreign currency or rupiah based on debt agreements or other agreements, deposit agreements and other obligations to non-residents.

Foreign debt is a source of income for a country from outside, both in the form of grants and loans which play an important role in completing the lack of financing to accelerate foreign exchange and savings growth (Kuswantoro, 2017). Pellu (2019) stated that theoretically the problem of foreign debt can be explained through the national income approach. As one of the sources of development financing, foreign debt is needed to cover 3 deficits, namely the investment savings gap deficit, budget deficit and current account deficit.

There are several research analyzed the factors determined the foreign debt. Previous research by Jannah & Shidiqi (2017) studied on factors affecting foreign debt in Indonesia for the period 195-2015 using the VECM model. The results obtained that in the long run GDP, money supply, and exchange rate have a negative and significant effect on foreign debt in Indonesia, while FDI does not have a significant effect on foreign debt. Furthermore, research from Qoimah (2020) which analyzes the relationship between national income, current account deficit and rupiah exchange rate with Indonesia's external debt for the first quarter of 2014-third quarter of 2019. By

using descriptive analysis methods and Pearson Product Moment correlation analysis. The results of the analysis show that national income, current account deficit and rupiah exchange rate have a significant positive relationship with Indonesia's external debt. The same results were shown by Awan et al., (2015) who examined about An Econometric Analysis of Determinant of External Debt in Pakistan. The data used are time series data from 1976-2010 using the Autoregressive distributed lag (ARDL) analysis method. The results of the analysis show that fiscal deficits, nominal exchange rates and trade openness in the long run have a positive and significant influence on foreign debt.

3. Research Methodology

This study used a secondary type of data in the form of monthly time series from 2008 to 2020. In this study using quantitative analysis with the Multiple Linear Regression method to determine the influence between independent variables and dependent variables. The model used is VECM (Vector Error Correction Model) analysis with data processing using the Eviews10 software application.

According to Basuki & Yuliadi, (2014) the VECM model is part or design of Vector Autoregressive (VAR) which is used when stationary data is at the first difference level and meets the cointegration test. This model does not need to distinguish between endogenous and exogenous variables, because all variables are fed into the model. The VECM specification restricts long-term behavioral relationships between variables in order to converge into cointegration relationships without disrupting changes that occur dynamically in the short term (Widarjono, 2007).

VECM is characterized by the inclusion of Error Correction Term (ECT) elements in the model. The ECT value is referred to as a disequilibrium error. Therefore, the ECT value must be equal to zero in order to be in equilibrium (Sohibien, 2015). Erwandi et al., (2019) said the form of the general equation VECM is as follows:

$$\Delta Y_t = \alpha_0 + \Pi Y_{t-1} + \sum_{i=1}^p \beta_n \Delta Y_{t-1} + \varepsilon_t$$

Where Δ is the differential operator, where $(\Delta y_t = y_t - y_{t-1})$, α_0 is the intercept vector/constant, β_i is the i-th free-variable matrix coefficient of size $n \times n$ for each $(i = 1, 2, \dots, p-1)$, Π is the cointegration coefficient matrix (ECT) is the cointegration vector (long-run parameter), y_{t-1} is the free variable vector at the 1st lag, and ε_t is the residual vector.

From the general equation above, the variables of foreign exchange reserves, exchange rates, LIBOR interest rates, and foreign debt are included in the form of a VECM model with a lag length (p-1) as follows:

$$\Delta ULN_t = A_0 + \alpha_{1ect} ECT_{t-1} + \alpha_{2t-1} + \sum_{i=1}^p \Gamma_i \Delta ULN_{t-i} + \sum_{i=1}^p \Gamma_{4i} \Delta CD + \sum_{i=1}^p \Gamma_{t-1} \Delta NT + \sum_{i=1}^p \Gamma_t \Delta SB + \varepsilon$$

$$\Delta CD_t = A_0 + \alpha_{1ect} ECT_{t-1} + \alpha_{2t-1} + \sum_{i=1}^p \Gamma_i \Delta ULN_{t-i} + \sum_{i=1}^p \Gamma_{4i} \Delta CD + \sum_{i=1}^p \Gamma_{t-1} \Delta NT + \sum_{i=1}^p \Gamma_t \Delta SB + \varepsilon$$

$$\Delta NT_t = A_0 + \alpha_{1ect} ECT_{t-1} + \alpha_{2t-1} + \sum_{i=1}^p \Gamma_i \Delta ULN_{t-i} + \sum_{i=1}^p \Gamma_{4i} \Delta CD + \sum_{i=1}^p \Gamma_{t-1} \Delta NT + \sum_{i=1}^p \Gamma_t \Delta SB + \varepsilon$$

$$\Delta SB_t = A_0 + \alpha_{1ect} ECT_{t-1} + \alpha_{2t-1} + \sum_{i=1}^p \Gamma_i \Delta ULN_{t-i} + \sum_{i=1}^p \Gamma_{4i} \Delta CD + \sum_{i=1}^p \Gamma_{t-1} \Delta NT + \sum_{i=1}^p \Gamma_t \Delta SB + \varepsilon$$

From the four equations above, this study aims to see the influence of variables of foreign exchange reserves, exchange rates, and LIBOR interest rates on Indonesia's foreign debt.

4. Results and Discussion

Stationary Test Research Data

Stationary testing on each time series data is a general requirement that must be done, considering that regression results can have a good impact on the model. The following stationary test results using the ADF test with constants can be seen in Table 1:

Table 1. Unit Root Test Results

Variabel	Level			First Difference		
	ADF	Critical value	P-value	ADF	Critical value	P-value
Foreign Exchange Reserves (CDs)	-1,499684	-3,439075	0.8258	-10.44706	-3.439267	0.0000
Exchange Rate (NT)	-2,064626	-3.439075	0.5610	-11.78087	-3.473096	0.0000
Interest Rate (SB)	-1.563865	-3.439461	0.8027	-6.972720	-3.473382	0.0000
External Debt (external debt)	-1,410413	-3,439075	0.8544	-13.46585	-3.473096	0.0000

Source: processed data (2022)

Stationary test results in table 1 indicates that no variable has obtained a stationary result at the *level*. While in the next order the variables of foreign exchange reserves, exchange rates, and stationary interest rates at the *first difference* level. This shows that the VECM model can be used. This VECM model can be used because of stationary data at the *first difference* level.

Optimum Lag Test

Optimum lag testing is performed to eliminate autocorrelation problems in the VAR system which will be useful when performing VAR stability analysis. The selection of optimal lag can be seen through criteria from *Akaike Information Criterion (AIC)*, *Schwarz Information Criterion (SIC)*, *Likelihood Ratio (LR)* *Hannan and Quinn Information (HQIC)*, and *Final Prediction Error (FPE)*.

Table 2. Optimum Lag Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1188.702	NA	1.17E-12	-16.11840	-16.03702*	-16.08533
1	1228.367	76.63215	8.52e-13*	-16.44037*	-16.03351	-16.27506*
2	1240.647	23.05647	8.96E-13	-16.38976	-15.65741	-16.09220
3	1253.933	24.22149	9.31e-13	-16.35283	-15.29499	-15.92302
4	1268.554	25.86055	9.51e-13	-16.33407	-14.95074	-15.77201
5	1278.824	17.60546	1.03e-12	-16.25611	-14.54729	-15.56180
6	1292.060	21.96995	1.08E-12	-16.21851	-14.18420	-15.39194
7	1305.422	21.45167	1.13e-12	-16.18261	-13.82281	-15.22380
8	1323.593	28.18361*	1.10E-12	-16.21215	-13.52686	-15.12109

Source: processed data (2022)

Based on Table 2. above, the optimum lag length lies in the lag that has the most stars recommended by Eviews on the available lag criteria or selects the criteria that has the smallest value. The results show that the LR criteria are located at the 8th lag with a value of 28.18361, the FPE, AIC, HQ criteria are located at the 1st lag with values of 8.52e-13, 16.44037, and 16.27506, while for the SC criteria are located at the 0th lag of 16.03702. The optimum lag length most widely recommended in the VAR model is at the first lag length. Thus, the 1st lag is the optimum lag selected based on the results of FPE, IAC, and HQ criteria.

Model Stability Test

After testing the optimum lag length, the results of estimating the VAR equation must be tested for stability first so that the IRF and FEVD results are valid. The results of stability testing can be seen in the following table.

Table 3. Model Stability Test Results

Root	Modulus
0.497210 - 0.142221i	0.517151
0.497210 + 0.142221i	0.517151
-0.014096 - 0.419570i	0.419806
-0.014096 + 0.419570i	0.419806
-0.375230 - 0.085733i	0.384900
-0.375230 + 0.085733i	0.384900
0.015061 - 0.290684i	0.291073
0.015061 + 0.290684i	0.291073

Source: processed data (2022)

Based on the test results in the table above, the modulus value of each root has a value of less than one (<1), which is at a value of 0.517151 to 0.291073. A modulus value of less than one indicates that the VAR estimation results have met stable conditions, so that when testing IRF and FEVD estimates in the long term will obtain valid results.

Cointegration Test

The next stage for the VECM model to proceed is to conduct a cointegration test, provided that the results show a long-term equilibrium relationship. In this study, the authors used *Johansen's Cointegration Test* method to see the long-term balance relationship (cointegration) between variables in the study. By choosing assumption 3 in the cointegration test, namely *intercept (no trend)* on CE or VAR test, the following results are obtained:

Table 4. Cointegration Test Results

Hypothesized No. Of CE(s)	Eigenvalue	Statistics	Critical Value	Prob
Trace Statistics				
None*	0.482005	258.1775	54.07904	0.0000
At most 1 *	0.389231	157.5357	35.19275	0.0000
At most 2 *	0.259351	82.10105	20.26184	0.0000
At most 3 *	0.210519	36.16612	9.164546	0.0000
Maximum Eigenvalue				
None*	0.482005	100.6419	28.58808	0.0000
At most 1 *	0.389231	75.43461	22.29962	0.0000
At most 2 *	0.259351	45.93494	15.89210	0.0000
At most 3 *	0.210519	36.16612	9.164546	0.0001

Source: processed data (2022)

Based on the results of the cointegration test shown in Table 4 showing that at a real level of 5 percent, the results of the *trace statistic* and *maximum eigenvalue* statistical tests show that the

four equations have a statistical value greater than the critical value at a confidence level of 5 percent and the probability value of the four equations above is also worth less than 5 percent. So it can be concluded as a whole that the variables used are mutually cointegrated with each other or have a long-term balance relationship between the variables of foreign debt, foreign exchange reserves, exchange rates, and interest rates in Indonesia for the period 2008-2020. The existence of cointegration indicates that the model used in research can be continued using the VECM model.

VECM Model Regression

After all stages are completed and the cointegration test shows a long-term balance relationship between variables in the study, this study can estimate VECM modeling by looking at the influence of variables of foreign exchange reserves, exchange rates, and interest rates on Indonesia's external debt in 2008-2020. The estimation results using the VECM regression method are as follows:

Table 5. Long-Term VECM Model Estimation Results

Variable	Coefficient	T-static
LOG_CD(-1)	-0.636103	-4.83797
LOG_NT(-1)	-1.335495	-7.09042
SB(-1)	0.003944	0.10798

Source: processed data (2022)

$$\text{Log ULN} = 1.000000 \text{Log ULN}(-1) - 0.636103 \text{Log CD}(-1) - 1.335495 \text{Log NT}(-1) + 0.003944 (SB - 1)$$

Based on the estimation results in the VECM model above in table 4.5 it can be seen that:

T-statistics partial long-term foreign exchange reserves (CD) at lag 1 amounted to -4.83797 > 1.65501 t-table. That is, H_0 was rejected and H_1 was accepted or in other words the CD variable had a significant and negative effect on external debt of -4.84 percent. The relationship of CD to negative external debt is indicated by a CD coefficient value of -0.636103. So that lag 1 CD negatively affects external debt (external debt) by -0.63 percent. This means that if there is an increase in CD by one point in the previous month, it will decrease the external debt in the current year by -0.63 points assuming other variables are constant.

T - partial statistics of the long-term exchange rate of the Rupiah (NT) at lag 1 of -7.09042 > 1.65501 t-table. That is, H_0 was rejected and H_1 was accepted or in other words the NT variable had a significant and negative effect on external debt of -7.09 percent. The relationship between NT and negative external debt is indicated by the NT coefficient value of -1.335495 so that at 1 NT lag has a negative effect on external debt (external debt) of -1.34 percent. This means that if there is an increase in NT by one point in the previous month, it will decrease the external debt in the current year by -1.34 points assuming the other variables are constant.

T-statistic partial interest rate (SB) in the long run at lag 1 of $0.10798 < 1.65501$ t-table. That is, H_0 is accepted and H_1 is rejected, in other words the variable SB has no significant effect on external debt.

Table 6. Short-Term VECM Model Estimation Results

Variable	D(LOG_ULN)	D(LOG_CD)	D(LOG_NT)	D(SB)
D(LOG_ULN(-1))	-0.198572	-0.346919	0.318179	-0.486805
	(0.12314)	(0.25149)	(0.24729)	-119.582
	[-1.61251]	[-1.37943]	[1.28667]	[-0.40709]
D(LOG_CD(-1))	0.118582	0.266386	-0.333245	0.048881
	(0.05242)	(0.10706)	(0.10527)	(0.50905)
	[2.26208]	[2.48822]	[-3.16566]	[0.09602]
D(LOG_NT(-1))	0.053978	0.012372	-0.031236	-1.154.852
	(0.04932)	(0.10073)	(0.09905)	(0.47897)
	[1.09436]	[0.12282]	[-0.31536]	[-2.41112]
D(SB(-1))	-0.002574	-0.040883	0.038378	0.292591
	(0.00809)	(0.01652)	(0.01625)	(0.07856)
	[-0.31823]	[-2.47453]	[2.36238]	[3.72453]
R-squared	0.014360	0.066273	0.115666	0.137130
Adj. R-squared	-0.012100	0.041207	0.091926	0.113966
Sum sq. Resids	0.031953	0.133272	0.128852	3.013.103
S.E. equation	0.014644	0.029907	0.029407	0.142205
F-statistic	0.542720	2.643.895	4.872.109	5.919.907
Log likelihood	4.344.771	3.245.116	3.271.086	8.440.009
Akaike AIC	-5.577.624	-4.149.501	-4.183.228	-1.031.170
Schwarz SC	-5.479.022	-4.050.899	-4.084.626	-0.932568
Mean dependent	0.006680	0.005624	0.002754	-0.015779
S.D. dependent	0.014556	0.030543	0.030860	0.151074

Source: processed data (2022)

In the short term, variable external debt (external debt) one month earlier had a negative but not significant effect on external debt in the current month. Where t-statistics external debt amounted to $1.61251 < 1.65501$ t-table.

In the short term, the variable Foreign Exchange Reserves (CD) one month earlier had a positive and significant effect on external debt in the current month of 0.05242. With t-statistics of foreign exchange reserves of $2.26208 > 1.65501$ t-table. That is, if there is an increase in foreign exchange reserves in the previous month, foreign debt will also increase by 0.118582 percent.

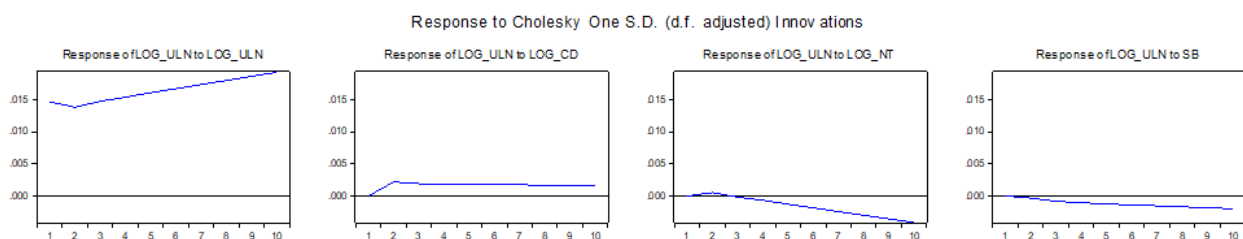
In the short term, the variable Exchange Rate (NT) one month earlier had a positive but not significant effect on external debt in the current month. Where the t-statistical exchange rate is $1.09436 < 1.65501$ t-table.

In the short term, the variable LIBOR Interest Rate (SB) one month earlier had a negative but not significant effect on external debt (external debt) in the current month. Where t-statistics *LIBOR* interest rate of $0.31823 < 1.65501$ t-table.

Impulse Response Function (IRF)

In this study, the author explains how the estimated impact received by foreign debt variables on shocks experienced by foreign exchange reserves, exchange rates, and LIBOR interest rates so that it can be known how long the influence of shocks experienced by foreign debt variables.

If the response given is above the horizontal line, then the shock that occurs causes a positive influence, and vice versa. If the response given is below the horizontal line, then the shock that occurs causes a negative influence. Figure 3. shows the response given by the foreign exchange reserve variable to the shock of its own variable.



From the chart above, the response of foreign debt to its own variable shock was positive, but in the 2nd period it decreased, then rose again until the 10th period and remained positive. Just like foreign debt, foreign debt has a positive response to shocks in foreign exchange reserves from the first period to the 10th period. Although, the response to foreign exchange reserves continues to decline little by little. In contrast to these variables, the external debt response to rupiah exchange rate shocks was positive until the 2nd period, then the response continued to decline and negative until the 10th period. Similarly, the response of foreign debt to the shock of the LIBOR interest rate continues to decline and is negative.

Forecast Error Variance Decomposition (FEVD)

Table 7. Results of Analysis of Forecast Error Variance Decomposition of Foreign Debt

Variance Decomposition of LOG_ULN:					
Era	S.E.	LOG_ULN	LOG_CD	LOG_NT	SB
1	0.014644	100.0000	0.000000	0.000000	0.000000
2	0.020255	98.73800	1.170416	0.064776	0.026808
3	0.025147	98.49621	1.334136	0.048997	0.122661
4	0.029574	98.32232	1.367245	0.091714	0.218718
5	0.033745	98.14464	1.338479	0.213489	0.303394
6	0.037766	97.92209	1.286699	0.412576	0.378637
7	0.041697	97.64590	1.225976	0.680154	0.447971
8	0.045575	97.31900	1.162378	1.005163	0.513457
9	0.049425	96.94805	1.098835	1.377057	0.576056
10	0.053262	96.54043	1.036905	1.786474	0.636195

Source: processed data (2022)

Results of *variance decomposition* analysis in table 7. shows that in the first month the external debt variance is explained by its own variable by 100 percent, while the other variables do not contribute to foreign debt. In the second month, the external debt variable explained its own variable of 98.73 percent and the remaining 1.27 percent was explained by the variables of foreign exchange reserves, exchange rates, and *LIBOR* interest rates. In the third month, the external debt variable still contributed the most to its own variable, which amounted to 98.49 percent. The rest is explained by other variables in the study, namely foreign exchange reserves, exchange rates, and *LIBOR* interest rates.

During the period, the external debt variable remained the variable that contributed the most to its own variable. The average contribution he made was 89.30 percent. Furthermore, the second largest contribution to foreign debt, namely variable foreign exchange reserves of 1.10. Then, the third is the exchange rate variable which contributes 0.65 percent. Finally, the variable *LIBOR* interest rate contributed 0.32 percent to foreign debt.

5. Policy Conclusions and Implications

Conclusion

From the explanation above, it can be concluded that foreign exchange reserves and the rupiah exchange rate have a negative and significant effect on foreign debt. This means that when foreign exchange reserves increase and the exchange rate appreciates, the amount of foreign debt will decrease and vice versa. This means that the country will remain in debt to other countries even though the foreign exchange reserves obtained are high. However, the amount of debt obtained is

not as much as when foreign exchange reserves decline. Meanwhile, the LIBOR interest rate has no effect on foreign debt.

Policy Implications

Based on these conclusions, it is expected that the government can take appropriate policy steps to reduce its dependence on foreign debt. One of them is by optimizing the use of foreign debt for productive activities, so that foreign exchange reserves can increase and of course the amount of debt borrowed can decrease. Then the government also needs to strengthen foreign exchange reserves by increasing exports. Furthermore, researchers who examine similar research on Indonesia's foreign debt are advised to add or replace other variables, both economic and non-economic factors.

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