Policy Determinants of Budget Deficit in Indonesia

Yolanda[1]*, Herry Wira Wibawa[2], Muslim Kamil[3]

[1,2,3] Lecture University of Borobudur, Jakarta, Indonesia

ABSTRACT: In this study, the causes of the budget deficit in Indonesia were examined using multiple regression analysis and the Error Correction Model (ECM) technique utilizing annual data for the years 1998 to 2020. The results show that in the short term, only inflation and government subsidies have a significant impact on the budget deficit in Indonesia when using the Error Correction Model (ECM) approach to analyze the effects of the chosen money supply variables, foreign exchange rates, inflation, and government subsidies.. Long-term estimations indicate that the government subsidies, inflation, foreign exchange rates, and money supply variables all have a positive and considerable impact on the budget deficit. Within 7 months, the equilibrium between the short- and long-terms can be restored. Policymakers are advised to keep an eye on changes in the money supply, foreign exchange rates, inflation, and government subsidies to avoid causing the budget deficit to rise above the allowable limits, which are 3 percent of the State Revenue and Expenditure Budget.

KEYWORDS: Budget Deficit, Money Supply, Foreign exchange rates, Inflation, Government Subsidies

I. INTRODUCTION

A country's economic phenomenon can take the form of a boom, contraction, normal, or depression phase.. Whatever the form of the phenomenon that occurs, the government needs to anticipate it, because this phenomenon will affect the economic activity of a country. There are two government measures, fiscal policy and monetary policy, to anticipate excessive changes in the economic cycle and the phenomenon of imbalance between intended spending and public revenue. Fiscal policy is the management/direction of the economy toward a better or desirable state by controlling government revenues and spending. Meanwhile, monetary policy is the monetary authority's (central bank's) policy of controlling monetary amounts (such as the money supply, base money, interest rates, or bank credit) in order to achieve the intended economic development. activity.

The fiscal policy implemented by Indonesia is an expansionary fiscal policy with a deficit budget instrument (Anggito Abimanyu, 2003). Basically, expansionary fiscal policy is intended to provide more leeway in funds to the public to stimulate the economy. However, fiscal policy often becomes less effective if it is not supported by the right circumstances or conditions and other consistent policies, it is even possible that fiscal stimulus policies can actually hamper the pace of the economy. According to Anggito Abimanyu (2003), fiscal stimulus must be balanced with accommodative monetary policy and if not, it will lead to counterproductive results.

The development of this expansionary fiscal policy can be seen from the development of the realization of the deficit in the government budget as follows:

Table 1 : Budget Deficit and GDP In Indonesia Year 2016-2020

No.	Year	Budget Deficit (BD) (Billion)	% Δ	GDP	% (BD dari GDP)
1	2016	308341	3,30	9 434 613,40	3,27
2	2017	340976	10,58	9 912 928,10	3,44
3	2018	269443	-69,03	10 425 851,90	2,58
4	2019	348654	29,40	10 949 155,40	3,18
5	2020	947698	171,82	10 723 054,80	8,84
Rata-rata		443022	29,21	10 289 120,80	4,31

Source: Central Bureau of Statistics and processed

According to the table above, the budget deficit in 2020 will be exceedingly substantial, increasing by 171.82% over the previous year. This is due, of course, to Indonesia's ongoing health and economic crises in 2020. (pandemic

covid 19). The COVID-19 epidemic has hampered progress and increased financing requirements. In an era of increased global uncertainty, these variables can stymie progress. Meanwhile, the proportion of the budget deficit as a

percentage of average GDP over the next five years (2016-2020) is higher than the legal limit of 3%. The explication of Article 12 paragraph 3 of Law Number 17 of 2003 concerning State Finances specifies that the budget deficit is limited to a maximum of 3% and the debt is limited to 60% of GDP (GDP).

According to Mankiw (2000) optimal fiscal policy requires deficit or surplus conditions in the budget for reasons: stabilization tools, tax smoothing and intergenerational redistribution. In general, developing and developed countries adopt budget deficit policies which are often caused by accelerating economic growth, equal distribution of people's incomes, low public purchasing power, weakening exchange rates, spending due to the global crisis, and excessive spending due to inflation. Meanwhile Salih Barişik and Abdullah Baris (2017) state that the budget deficit is considered a problem that limits the efficiency of the government's economic policies against macroeconomic problems such as unemployment and inflation.

Budget policy in Indonesia follows a fiscal deficit policy, as evidenced by the production of the State Revenue and Expenditure Budget (APBN) beginning with the New Order administration.the government always establishes an expansionary fiscal policy, which maintains a consistent budget deficit below 3 percent of GDP. In its development, budget deficit policy cannot be separated from the pros and cons regarding the timing and financing of the deficit because apart from monetary policy, fiscal balance (budget) is also an indicator to see macroeconomic health. The growing perception is that budget policies that are too large and for a long time are often the root cause of macroeconomic instability such as high inflation, large current account deficits, large debt obligations and low economic growth. And also research from Najid Ahmad (2003) The budget deficit in Pakistan has a positive and considerable effect on Gross Domestic Product (GDP).

The widening of the budget gap in Indonesia is related to several factors, including: (i) the increase in world oil prices, (ii) the increasing need for government investment funds, state capital participation, and the revolving fund for land acquisition for toll roads (BPJT); (iii) establishment of a national education development fund; and (iv) Loans to PT PLN (Persero). According to Mehmet Mercan (2014), a long-term analysis of the The OECD countries' budget deficits are weakly sustainable, and numerous measures must be put in place in order to keep them high.. Researchers discussing the determinants of budget deficits include Rukhsana Kalim and Muhammad Shahid Hassan (2013) in Pakistan, Genius Murwirapachena et al (2013) in South Africa, Mohammadreza Monjazeb et al (2014), Salih Barişik and Abdullah Baris (2017) in developing countries, Arien Sandra Olivia (2018) in Indonesia and Joseph Mawejje and Nicholas M. Odhiambo

(2021) in East Africa and Muhanned Obeidat et al (2022) in Jordan.

Based on the descriptions above, It is evident that a variety of factors, particularly in Indonesia, have an impact on the government's budget deficit policy.. In this study, the authors try to look at the factors that influence the budget deficit, namely the money supply, exchange rates, inflation, tax revenues and subsidies. Following is the formulation of the problem in this study::

1. How do the money supply, exchange rates, inflation, tax revenues and subsidies affect the government's budget deficit in Indonesia simultaneously?
2. How is the influence of the money supply, exchange rates, inflation, tax revenues and subsidies on the government budget deficit in Indonesia partially?

II. LITERATURE REVIEW

A deficit budget is a government policy to make expenditures greater than state income in order to stimulate the economy. It is generally very good to use if the economy is in a recession. Based on In accordance with Government Regulation (PP) Number 23 of 2003 of the Republic of Indonesia, the government budget deficit is the difference between state revenues and state expenditures during the same fiscal year. Nevertheless, according to neoclassical theory, the relationship between budget deficit and macroeconomic variables is a negative one, as budget deficits can affect a variety of macroeconomic variables and, ultimately, economic development (Arien Sandra Olivia et al, 2018). According to Hyman (2005), a government budget deficit is an excess of expenditures over revenues. Rahardja and Manurung (2004) describe a budget deficit as one in which a deficit is expected because government spending is anticipated to exceed government receipts (G>T).Meanwhile, Samuelson and Nordhaus stated that a budget deficit is a budget where spending is greater than taxes. According to Dornbusch, Fischer and Startz, the budget deficit is the difference between the amount of money the government spends and revenue from taxes. According to Barro (1989) there are several reasons for the occurrence of a budget deficit, namely: (1) Accelerating economic growth, (2) Equal distribution of public income, (3) Weakening of the exchange rate, (4) Increased spending due to the economic crisis, (5) Aberrant realization from the plan, (6) Increased spending due to inflation. Meanwhile, according to Mehmet Mercan (2014), a country needs to apply a high budget deficit in conditions of a lack of investment, a lack of consumption, high foreign loans, a lack of consumption, high foreign loans, and low private savings.

Money Supply, is a monetary policy instrument that is very tightly regulated because it can affect many components of a country's economy. Monetary policy is a means of controlling the amount of money provided by the monetary authorities in order to achieve a nation's targeted

economic growth. Macroeconomic theory states that there is a propensity for the government to implement an expansionary monetary policy by expanding the money supply as the difference between government spending and revenue widens. According to Keynes, the transmission mechanism, which involves three series of events, is how changes in the money supply affect the nation's economic activities (Sadono Sukirno, 2010). If the growth in the budget deficit is covered by an excessive expansion of domestic credit, the money supply is bigger than the demand for money, claim Mohammad Aslam Chaudhary and Ghulam Shabbir in 2005. While Drs. Abata, Matthew Adeolu, and James Sunday Kehinde (2012) contend that an excess of money supply will lead to an overabundance of demand for goods and services, higher prices, and a worsening of the balance of payments. Additionally, according to Rukhsana Kalim and Muhammad Shahid Hassan (2013), there is a strong correlation between the money supply and both short-term and long-term budget deficits.

According to Maimuna M. Shehu and Ibrahim M. Adamu (2021), foreign currency rates are the primary determinant of both the long-term and short-term budget deficits in Negeria. Additionally, Abbas et al. (2020) assert that changes in exchange rates have a significant effect on global trade, the balance of payments, and macroeconomic performance as a whole. The budget deficit and the nominal effective exchange rate are cointegrated, and there is a two-way causal relationship between them, according to Vuyyuri, Srivyal and Seshaiah, S. Venkata (2004). However, Phouthanouphet Saysombath and Phouphet Kyophilavong (2013) find no such Granger causal relationship between the budget deficit and the real exchange rate in Laos. According to Ewa Ziemba (2017), there is a direct and negative correlation between the exchange rate and the budget deficit. According to Maimuna Shehu and Ibrahim M. Adamu (2021), the foreign exchange rate is the primary factor affecting Nigeria's budget deficit.

Inflation, predicated on the assumption that, ceteris paribus, a rise in the money supply will result in an increase in both the quantity of money and the price level. Elsun Nabatov (2022) asserts that inflation is brought on by the printing of too much money to make up for the budget deficit that develops; Koyuncu (2014) contends that inflation feeds budget deficits, which in turn feed inflation, creating a vicious cycle. According to Phouthanouphet Saysombath and Phouphet Kyophilavong's (2014) research, inflation in the Lao PDR can result in a budget deficit. Javed

Ahmad Bhat and Naresh Kumar Sharma (2019) assert that monetary, structural, demand, external shocks, and demographic shifts are the economic elements that cause inflationary tendencies. According to research by Fareeha Safdar and Ihtsham Ul Haq Paddainflasi (2017) and Ekeocha, P. and A. Ikenna-Ononugbo (2017), inflation has a major impact on the budget deficit in Nigeria, inflation has a favorable effect on the deficit in Pakistan. According to Joseph Mawejje and Nicholas M. Odhiambo and other research findings, there is no direct link between inflation and budget deficits (2021).

Subsidies are one of the government's fiscal instruments, which take the form of assistance or financial incentives to the business/economic sector and society by the government of a country to increase people's purchasing power and encourage economic activity, the same thing stated by Aminullah Assagaf and Hapzi Ali (2017). Besides that, the provision of subsidies is also in the context of achieving social justice for the whole community. The form of subsidies The aid offered by the government might be either direct or indirect. The subsidy budget is published in the APBN, and its value can rise if economic activity decreases or events with an impact on economic activity are overcome. Furthermore, these subsidies may have a detrimental impact on raising government spending, hence increasing the budget deficit. Gerd Schwartz and Benedict Clements (1999) state the level of subsidies as benefits and costs in this scenario. Subsidies, according to Danlu Bu et al. (2017), can be viewed as capital invested in businesses.

III. METHODOLOGY

The budget deficit, money supply, foreign exchange rates, inflation, and subsidies are the six primary variables in the basic estimating model. The research is based on annual time series data from 1998 through 2020. Data derived from the Indonesian Central Bureau of Statistics' release (BPS).
Descriptive statistics were employed to examine the nature of the variables used in this investigation. Skewness with a negative value implies that the distribution has a long left tail, while skewness with a positive sign indicates a long right tail. A kurtosis value less than 3 suggests that the distribution is relatively flat, and a standard deviation value less than 1 indicates that the data is devoid of variance. The following table shows the solutions to these issues:

Table 2: Descriptive statistics for the variables

	Log Y	LogX1	Log X2	Log X3	Log X4
Mean	4.859032	5.692954	3.992195	0.772294	5.141840
Median	4.697613	5.712502	3.985426	0.806180	5.221156
Maximum	5.976670	6.268506	4.160799	1.890030	5.593245

Minimum	3.615036	5.005168	3.305351	0.225309	4.539264
Std. Dev.	0.589038	0.384584	0.174003	0.360632	0.306473
Skewness	-0.050838	-0.191665	-2.692061	1.144052	-0.421956
Kurtosis	2.233031	1.776752	11.73208	5.089590	2.182539

Source: Processed Eviews Versi .10

It is evident from the table above that the Skewness for variables Y, X1, X2, X4 has a negative sign, meaning a lengthy tail to the left of the distribution, while X3 has a positive sign. For variables Y, X1 and X4 the data is relatively flat and normally distributed as shown by the Kurtosis value below 3. For the mean, median, maximum and minimum the lowest is variable X3 and the highest is variable X1. The standard deviation of each variable is below 1, meaning that this value is below the mean value and this indicates that the data lacks variation.

All data from the variables analyzed were subjected to the Augmented Dickey Fuller (ADF) stationarity test. This test is run to detect the presence of a unit root in the data set. The ideal variable is data that is stationary at both the level and the first difference. Decision criteria for unit root testing: If the Augmented Dickey-Fuller (ADF) test statistics are greater than the Test Critical Values (critical value = 5%), the data is not stationary, and vice versa. The data is stationary if the Augmented Dickey-Fuller (ADF) test statistics Test Critical Values (critical value = 5%).If the variable data is not stationary at level and stationary at level 1 Difference ST, cointegration is performed. The Johansen cointegration test was used in this study for cointegration testing. According to Johansen, the cointegration test is normally only for variables that are integrated in the first and zero orders, namely I (1) and I (2). (0). In the framework of the VAR error correction model, Johansen's approach for assessing cointegration relationships. This will reveal whether or not the variable is related in the long run. Cointegration is calculated by comparing the Trace

Statistical value to the crucial value at a confidence level of 5% or 1%..

Error correction is a model used to correct the regression equation between variables that are individually not stationary. The goal of the Error Correction Model (ECM) method is to find long-term and short-term relationships between research variables that happen because of cointegration. Engel Granger's error correction model (ECM) is being used for this research (ECM). The Error Correction Model (ECM) is valid if the cointegrating variables are supported by an Error Correction Term (ECT) coefficient that is statistically positive and significant (Widarjono, 2009). The equation for the Error Correction Model (ECM):

$$\Delta Y = \beta_0 + \beta_1 \Delta X_{1t} + \beta_2 \Delta X_{2t} + \beta_3 \Delta X_{3t} + \beta_4 ECT + u_t$$

Where :
Y = Budget Defisit
X_1= Money Supply
X_2= Foreign Exchange Rates
X_3= Inflation
X_4= Government subsidies
u_t = residual value
ECT = Error Correction Term

Tests for Violation of Classical Assumptions: (1) Multicollinearity Test, (2) Heteroscedasticity Test (3) Auto Correlation Test, and (4) Normality Test, is shown in the subsequent table:

Table 3 : Classic assumption test

No	Problem	Hasil	Keterangan
1	Normalisitas	Jarque Berra= 4,286026 Probability = 0,118480	Normality Exists
2	Multikolinieritas	Dibawah 0,80	No Correlation
3	Heterokedasitas	Prob. Chi-Square(4) = 0.0982 > α = 5 %	No Heteroskedastcity
4	Autokorelasi	Prob. Chi-Square(2) =0.3227 > α = 5 %	No Autokorelasi

Source: Processed Eviews Versi.10

The model's Goodness of Fit is tested using two methods: (1) Individual Parameter Significance Test (t-test) and (2) Simultaneous Significance Test (F-test). The two tests described above are designed to assess the effect of the independent factors and the dependent variable, either partially or simultaneously. In order to improve the accuracy of the regression analysis,, the Goodness of Fit test (R² test) was used. This test is intended illustrates that the existing

model has a fairly high or low predictive power. The hypothesis is a temporary conjecture according to the idea and findings of earlier study. It is believed:

1. Is it assumed that the money supply, exchange rate, inflation, tax revenues Long-term and short-term, do subsidies have a substantial impact on the Indonesian government's budget deficit?

2. Is it assumed that the money supply, exchange rate, inflation, tax revenues and In both the long and medium

3.

term, do subsidies have a major impact on the government's budget deficit in Indonesia?

IV. RESULTS AND DISCUSSION

Table 4 below displays the results of the Augmented Dickey Fuller (ADF) stationarity test.:

Table 4: ADF Unit Root Test Result

Variabel	ADF (Level)		ADF 1 Difference ST	
	t-Statistic	Probability	t-Statistic	Probability
Defisit Budget (LogY)	0.267006	0.9700	-5.518761	0.0003
Money Supply (LogX$_1$)	-1.697529	0.4186	-5.323205	0.0004
Foreign Exchange Rate (LogX$_2$)	-3.384255	0.0230	-5.411556	0.0003
Inflation (LogX$_3$)	-5.898881	0.0001	-6.349834	0.0000
Government Subsidies (LogX$_4$)	-2.143062	0.2310	-5.219937	0.0004

Source: Processed Eviews Versi 10

Based on the results of calculations at the level, not all data is stationary, but at the 1st difference level, all data is stationary where the probability value of Augmented Dickey Fuller (ADF) is less than $\alpha = 5\%$. This indicates that the connection between the variables is one of long-term balance.

To get a stable long-term relationship between variables that are integrated to the same degree, a cointegration test must be conducted. Each variable tends to reach a long-term equilibrium throughout the course of each cycle. The cointegration test was conducted using the Johansen Test of Cointegration, and it was determined that there are cointegrating variables by comparing the Trace Statistical value to the critical value at a confidence level of 5% or 1% or the Max-Eigen Statistical value to the critical value at a confidence level of 5% or 1. This is illustrated in Table 5:

Table 5: Cointegration Test

Date: 12/27/22 Time: 16:47				
Sample (adjusted): 2000 2020				
Included observations: 21 after adjustments				
Trend assumption: Linear deterministic trend				
Series: log Y_ Log X1__Log X2 __Log X3___ Log X4				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.923619	109.2962	69.81889	0.0000
At most 1 *	0.776796	55.28372	47.85613	0.0086
At most 2	0.472963	29.79064	23.79707	0.2094
At most 3	0.360639	15.34045	10.49471	0.2554
At most 4	0.044114	3.947455	0.841465	0.3304
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				

Source: Processed Eviews Versi 10

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Displays the results of the Error Correction Model (ECM) test:

Table 6: Regression Estimation Results with the Domowitz Error Correction Model Method

Dependent Variable: DLogY				
Method: Least Squares				
Date: 01/02/23 Time: 15:20				
Sample (adjusted): 1999 2020				
Included observations: 22 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.084339	0.132791	0.635130	0.5343
$DLogX_1$	2.626502	2.097811	1.252020	0.2286
$DLogX_2$	0.366869	0.310676	1.180870	0.2549
$DLogX_3$	0.516889	0.145896	3.542845	0.0027
$DLogX_4$	0.998227	0.373714	2.671102	0.0167
RESID01(-1)	0.712696	0.219420	3.248095	0.0050
R-squared	0.687882	F-statistic		7.052538
Adjusted R-squared	0.590345	Prob(F-statistic)		0.001170

Source: Processed Eviews Versi 10

Based on the table above using the Domowitz – El Badawi Error Correction Model method, the ECT coefficient is statistically significant and positive, indicating that the ECM model is viable. The R-squared value in the ECM estimation results is 0.687882, which indicates that 68.79% of the budget deficit variation is explained by variations in the money supply variable (X1), foreign exchange rates (X2), inflation (X3), and government subsidies (X4) in the short and long term, while the remaining 31.21% is explained by variables outside the model. The ECT (Error Correction Term) value is positive, with a coefficient value of 0.712896 and a probability of 0.0050, indicating that it is statistically significant. The value of the ECT coefficient can influence how rapidly or slowly equilibrium can be restored. The value of the ECT coefficient can influence how rapidly or slowly equilibrium can be restored. The ECT coefficient value of 0.712696 indicates that the variance between the actual value and the balance value of the Budget Devisit variable will be adjusted within seven months. It can alternatively be understood that 71.2696 percent of the disparity can be rectified in the short term vs the long term in seven months. In addition, the constant coefficient value in the near run is 0.084339, which indicates a budget deficit of 8.4% if the variable money supply (X1), foreign exchange rates (X2), inflation (X3), and government subsidies (X4) do not change (X4). Inflation and government subsidies have a considerable impact on the budget deficit, although the short-term money supply and foreign currency rates have less effect. Table 7 displays the results of computing the long-term regression coefficient.

Table 7: Long-Term Regression Estimation

Dependent Variable: LogY				
Method: Least Squares				
Sample: 1998 2020				
Included observations: 23				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.817461	1.799637	0.454237	0.0051
$LogX_1$	1.452702	0.384086	3.782236	0.0014
$LogX_2$	0.338105	0.448226	0.754319	0.0404
$LogX_3$	0.342238	0.239030	1.431779	0.0169
$LogX_4$	0.715531	0.386625	1.850712	0.0087
R-squared	0.801313	F-statistic		15.17756
Adjusted R-squared	0.780494	Prob(F-statistic)		0.000014

Source: Processed Eviews Versi 10

Table 7 above shows the constant coefficient value in the long run is 0.8175 and is positive, this explains that without changes in the independent variables, the budget deficit will be worth 81.75 percent. Besides that, the magnitude of the variation in The realization of the actual budget deficit was affected by changing the independent variable to the extent of 78.05 percent, with the remaining portion being influenced by factors not covered in this study.

Furthermore, According to the long-term test results, there is a chance value of less than 5% that the realization of a budget deficit is significantly and favorably influenced by the money supply. The results of this study are consistent with those of Rukhsana Kalim and Muhammad Shahid Hassan's (2013) and Manamba Epaphra's (2015) research. The regression coefficient value is greater than one, indicating that a change from a money supply of 1 unit will result in an increase in the budget deficit of 1.4527. (2017). The realization of the budget deficit (probability value) of 0.0404 = 5% is significantly and favorably influenced by foreign currency rates. In light of this, it is clear that a one-unit increase in the foreign exchange rate will result in a change in the budget deficit of 0.338105 (33.81%). The findings of this study are consistent with those of Maimuna Shehu and Ibrahim M. Adamu's research in Nigeria from 2021 and Alam et alresearch .'s in Bangladesh from 2020.

In this study, it was discovered that the relationship between inflation and the budget deficit was positive and substantial, indicated as a probability value less than 5%, and that a one-unit increase in inflation only caused a 34.22 percent increase in the budget deficit. The findings of this study are consistent with those of Fatma Turan Koyuncu's (2014) research, which found a two-way causal relationship between the budget deficit and inflation. As inflation rises, the price of public spending rises as well, adding to the budget deficit. The government subsidy variable, meantime, significantly and favorably affects the budget deficit. Government subsidies have a 0.715531 (71.5 percent) impact on the budget deficit. Accordingly, a one-unit increase in government subsidies will result in a 0.715531 increase in the budget deficit.

V. CONCLUSION

The goal of the study was to analyze the factors that contribute to budget deficits. First off, short-term changes in the money supply and foreign exchange rates do not significantly affect budget deficits because they are unable to adjust for changes in the size of the deficits. This illustrates how these two factors' responses in the short term might have an impact on the budget deficit because both government subsidies and inflation have a major impact on the deficit. This prompt action is necessary to combat inflation since rising prices have an effect on economic activity, particularly on people's purchasing power. Second, over the long run, the factors of money supply, inflation, foreign currency rates, and government subsidies have a considerable and advantageous impact on Indonesia's budget deficit. This demonstrates that adjustments to the independent variables will have a positive, unidirectional impact on the budget deficit. The money supply has the most significant impact on the budget deficit because, if it is not accompanied by increases in output, interest rates, and investment, an increase in the money supply may have an impact on inflation.

Based on the above, all of the variables have a positive and significant effect on the budget deficit in Indonesia over the long term. The amount of the budget deficit that is allowed by law is 3% of the Gross Domestic Product, so the government needs to control it with fiscal and monetary policies so that the variables studied did not cause the budget deficit to grow more than what is allowed by law.

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