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Analysis Affecting the Budget Deficit and it's Factors in Indonesia for the Period 1995-2020

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ABSTRACT

The budget deficit is the difference between state revenue and state spending in the same fiscal year. Budget deficits in Indonesia often occur every year, budget deficits that occur are carried out to improve development and people's welfare. The purpose of this research is to identify the strength and direction of *Gross Domestic Product* (GDP), foreign exchange reserves, total government debt, inflation and the exchange rate on the budget deficit in Indonesia during the 1995-2020 period. The analysis used is *Ordinary Least Squares* (OLS) regression analysis. The data in this study are time series data obtained from Central Bank of Indonesia, the *Central Bureau of Statistics* (BPS), the Ministry of Finance of the Republic of Indonesia, the *World Bank* and the IMF. According to the study's findings, the variables GDP, foreign exchange reserves, total public debt, and exchange rate all significantly affect the budget deficit. In the meanwhile, budget deficit is unaffected by the inflation variable.

Keywords : Gross Domestic Product (PDB), Foreign Exchange Reserves, Total Government Debt, Inflation, Exchange Rate, Ordinary Least Squares (OLS)

INTRODUCTION

The budget deficit is the difference, in the same budget year, between state revenue and state spending. According to Matthew Keep (2022), a budget deficit occurs when the government spends the money it takes in (taxes and other revenues), which is then utilized to make up for the deficits in the economy. The occurrence of a budget deficit is caused by several important factors. According to Suharno (2008), the occurrence of a budget deficit can be caused by spending due to the crisis, expenses due to inflation, weakening of the exchange rate, realization of the state budget that deviates from the plan, acceleration of economic growth and distribution of people's income.

In Indonesia, the phenomenon of budget deficit has often occurred. This is happening because Indonesia is currently accelerating infrastructure development to boost economic growth. To cover the budget deficit, the government made foreign and domestic loans. In addition, foreign loans were also used to meet community needs, including in terms of providing public facilities.

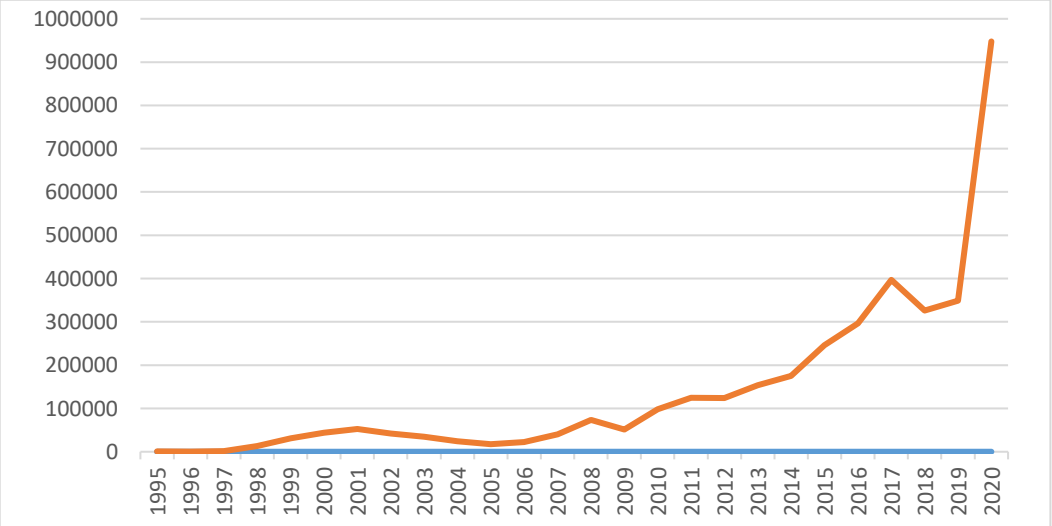

Figure 1: Budget Deficit in Indonesia Period 1995-2020 (Billion Rp)

Figure 1 shows data on the development of the state budget deficit in Indonesia in 1995-2020, where statistics fluctuate each year. The graph shows that the highest state budget deficit occurred in 2020, at 947,697.80 billion rupiahs and the lowest state budget deficit occurred in 1996, at 297.20 billion rupiahs.

In 1996, The Indonesian state budget deficit reduced over the previous year. This happened because the GDP experienced an increase in addition to the country's foreign exchange reserves which were higher than the previous year which resulted in a decrease in the budget deficit. Then in the following year the state budget deficit experienced a significant increase in 1998, amounting to 13,158.70 billion rupiahs. This was due to the monetary crisis which had an impact on the condition of the state state. At the beginning of 2001-2005, the state budget deficit in Indonesia decreased from 2.78 percent of GDP in 2001, then in 2005 the state budget deficit became 0.74 percent of GDP.

In addition, Indonesia's state budget deficit has generally worsened in the years afterwards. In 2017, Indonesia's state budget deficit came very close to equaling 3 percent

of GDP. This increase was due to an increase in state spending and insufficient tax revenue. The peak of the increase in the state budget deficit occurred in 2020. The state budget deficit in that year reached 6 percent of GDP. This figure is allowed because of Law Number 2 of 2020 concerning Stipulation of Government Regulation in lieu of Law Number 1 of 2020 concerning State Financial Policy and Financial System Stability for unusual situations. The state budget deficit in 2020 experienced a very significant increase from the previous year due to the Covid-19 pandemic that was currently sweeping the world. The increase in the state budget deficit was used to withstand the condition of society and the economy which experienced an extraordinary shock due to the Covid-19 pandemic.

The increasing deficit of the state budget every year proves that the condition of the state is getting worse, due to the lack of high GDP (*Gross Domestic Product*). Increasing GDP will increase state revenue so that the state budget deficit can be covered. In addition to GDP, the total amount of state debt must also be reduced because if the state has more debt but with less state income, it will result in a budget deficit. The state's foreign exchange reserves also need to be added. According to Satrianto (2014), an increase in foreign exchange reserves can support debt owned by the state because foreign exchange reserves can be used to pay state financing so that this will reduce the budget deficit caused by state debt. Based on this explanation, this study aims to observe various factors that will affect the state budget deficit in Indonesia in the 1995-2020 period.

METHOD

This type of research is a quantitative study. The data used is time series data, specifically data collected in a certain time series in accordance with time order. The data is obtained from literature, reports or books that are still related to the problem under study and data sources obtained from Central Bank of Indonesia, IMF, World Bank, the *Central Bureau of Statistics* (BPS) and the Ministry of Finance of the Republic of Indonesia from 1995-2020.

To estimate the direction and impact of the effect of *Gross Domestic Product* (GDP), foreign exchange reserves, total government debt, inflation and the exchange rate on the budget deficit in Indonesia for 1995 until 2020, the *Ordinary Least Square* (OLS) regression analysis tool is used, with the econometric model as following:

$$logDA_t = \beta_0 + \beta_1 logPDB_t + \beta_2 logCDEV_t + \beta_3 logTHP_t + \beta_4 INF_t + \beta_5 logKURS_t + e_t$$

Description:

DA_t	: Budget Deficit (billion rupiah)
PDB_t	: Gross Domestic Product (billion rupiah)
$CDEV_t$	: Foreign Exchange Reserves (Million US$)
THP_t	: Total Government Debt (billions of US$)
INF_t	: Inflation (percent)
$KURS_t$	: Rupiah Exchange Rate (rupiah per US$)
β_0	: Constant
$\beta_1 \cdots \beta_6$	: Independent variable regression coefficient
e	: *Error term*
t	: year t

RESULT AND DISCUSSION

Data processing in this study used Eviews software version 10. Results that demonstrate a link between the independent variabels and the dependent variables, both directly and indirectly, may be demonstrated via the usage of this program. The following table can show the estimation results based on the data that has been processed.

Table 1. Estimation Results

$logDA_t = -22.3026 - 1.1039\ logPDB_t + 1.8689\ logCDEV_t +$
(0.0575)*** (0.0129)**
$1.1335\ logTHP_t - 0.0049\ INF_t + 1.4655 logKURS_t$
(0.0107)** (0.6852)** (0.0311)**
R^2 = 0.9655; DW = 1.6722; F statistic = 111.8043; Prob. F = 0.00000
Diagnostic Test
(1) Multicollinearity (VIF)
logPDB = 60.7224; *logCDEV* = 39.6922; *logTHP* = 24.3607;
INF = 2.6963; *logKURS* = 16.2045
(2) Residual Normality (Jarque-Bera)
JB(2) = 2.4234; Prob. JB(2) = 0.2977
(3) Autocorrelation (Breusch-Godfrey)
$\chi^2(2)$ = 0.7457; Prob. $\chi^2(2)$ = 0.6888
(4) Heteroscedasticity (White)
$\chi^2(10)$ = 22.3499; Prob. $\chi^2(10)$ = 0.0134
(5) Linearity (Ramsey RESET)
F(2, 18) = 3.8611; Prob. F(2, 18) = 0.0402

Source : Process Eviews Data 10. **Description:** *Significant at α = 0.01; **Significant at α = 0.05; ***Significant at α = 0.10. The number in brackets is the empirical probability statistic t.

Classic Assumption Test

Multicollinearity Test

The purpose of the multicollinearity test is to determine whether there is a correlation between the independent variables (Ghozali, 2018). In this study, to determine whether there is multicollinearity in the regression model, the VIF (*Variance Inflation Factor*) test was used. If an independent variable's VIF score in the VIF test is higher than 10, there may be a multicollinearity problem with that variable. The table below shows the findings of the VIF tests used in this research.

Table 2. Multicollinearity Test

Variable	Coefficient Variance	VIF
LOG(PDB)	0.300075	60.72237
LOG(CDEV)	0.468504	39.69219
LOG(THP)	0.162196	24.36071
INF	0.000142	2.696324
LOG(KURS)	0.399199	16.20448

Source: Process Eviews Data 10

From Table 2. above it is known that the inflation variable does not cause multicollinearity. While the remaining GDP, foreign exchange reserves, total government debt and exchange rate variables cause multicollinearity because the VIF value is > 10.

Residual Normality Test

In this study the residual normality test was detected using the Jarque-Bera (*JB*) test which aims to determine whether the residual values are normally distributed or not. H_0 on the JB Test, namely the normally distributed regression model and H_A on the *JB Test*, namely the regression model is not normally distributed. If the statistical probability $JB > \alpha$ then H_0 is not rejected; H_0 is rejected if the statistical probability $JB \leq \alpha$. According to Table 1. as can be seen that the *JB* statistic's probability value is 0.2977, which means the statistical probability of $JB > \alpha$ (10% = 0.10); so that H_0 is not rejected. Thus, the regression model considered normally distributed.

Autocorrelation Test

The focus of the autocorrelation test is to find out whether there is a correlation between the error variables in period *t* and the error variables in periods *t*-1 or *t*+1. Autocorrelation problems can be detected using the Breusch-Godfrey (*BG*) test. H_0 in the *BG* test states that there are no autocorrelation troubles in the regression model, contrary to the H_A has autocorrelation troubles in the regression model. H_0 is not rejected if the statistical probability χ^2 test $BG > \alpha$; H_0 is rejected if the statistical probability χ^2 *BG* test $\leq \alpha$. From Table 1. the statistical probability value χ^2 for the *BG* test is 0.6888, meaning that the statistical probability χ^2 for the BG test > α (10% = 0.10); thus H_0 is not rejected. So that, it can be concluded that there is no autocorrelation troubles in the regression model.

Heteroscedasticity Test

The heteroscedasticity test was carried out with the aim of testing whether there is an inequality of variance or residual from one observation to another (Ghozali, 2016). Heteroscedasticity in this study was tested using the White Test. H_0 in the White Test, indicates that the regression model does not have heteroscedasticity troubles, while for H_A in the White Test, there is a troubles of heteroscedasticity in the regression model. If the statistical probability χ^2 White's test > α, so H_0 is not rejected and H_0 is rejected if the statistical probability χ^2 White's test ≤ α. In Table 1, the statistical probability χ^2 White's test is 0.0134, which means the statistical probability χ^2 White's test > α (1% = 0.01); H_0 is not rejected. Therefore, it may be said that the regression model does not have a heteroscedasticity problems.

Model Specification Test

To find out whether the regression model is linear or not, it will be tested using the Ramsey Reset Test or what is known as the general specification test (*general test of specification error*). H_0 in this test states that the regression model specifications are precise or linear, while H_A in this test states that the regression model specifications are not precise or non-linear. If the statistical probability F Ramsey Reset test > α, then H_0 is not rejected; H_0 will be rejected if the statistical probability F Ramsey Reset test ≤ α. As seen in Table 1, the statistical probability F for the Ramsey Reset test is 0.0402, which means the statistical probability F Ramsey Reset test > α (1% = 0.01); so that H_0 is not rejected. Therefore, it may be said that the regression model's specification is precise or linear.

Model Goodness Test

Model Existence Test (F Test)

Test the existence of the regression model in this study using the F. H_0 test in the F test, namely $\beta 1 = \beta 2 = \beta 3 = \beta 4 = \beta 5 = 0$, GDP variables, foreign exchange reserves, total government debt, inflation and exchange rates together have no effect against the budget deficit. As for the H_A, namely $\beta 1 \neq \beta 2 \neq \beta 3 \neq \beta 4 \neq \beta 5 \neq 0$, the variables GDP, foreign exchange reserves, total government debt, inflation and exchange rates together affect the budget deficit. If the statistical probability F > α, H_0 is not rejected; H_0 is rejected if the statistical probability F ≤ α. Based on Table 1. the value for the statistical probability F in the regression model is 0.0000, which means the statistical probability F <α (1% = 0.01); so H_0 is rejected, so that the variables GDP, foreign exchange reserves, total government debt, inflation and the exchange rate together affect the budget deficit.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) shows the predictive power of the regression model of 0.9655; meaning that 96.55% of the variation in GDP, foreign exchange reserves, total government debt, inflation and the exchange rate can be explain the budget deficit, while variations in other independent variables outside the model contribute for the remaining 3.45% of the variance.

Influence Validity Test (*t* Test)

In this research, the *t* test was used to determine if each independent variable had a partial impact on the dependent variable.

Table 3. Influence Validity Test Results

Variable	Prob. t	Criteria	Conclusion
LOG(PDB)	0.0575	≤ 0.10	Proven to be true α = 0.10
LOG(CDEV)	0.0129	≤ 0.10	Proven to be true α = 0.10
LOG(THP)	0.0107	≤ 0.10	Proven to be true α = 0.10
INF	0.6852	> 0.10	Not proven real
LOG(KURS)	0.0311	≤ 0.10	Proven to be true α = 0.10

Source: Table 1

Based on Table 3. the results show that the variables *Gross Domestic Product* (GDP), foreign exchange reserves, total government debt and the exchange rate have an effect on the budget deficit at significance α (10% = 0.10). Meanwhile, the inflation variable has no effect on α (10% = 0.10) on the budget deficit.

DISCUSSION

Relationship between *Gross Domestic Product* (GDP) and the Budget Deficit

The GDP variable in this study has a significant effect on the budget deficit with a regression coefficient of -1.103915. A negative regression coefficient indicates that GDP has a negative effect on the budget deficit. If GDP increases by 1 percent, the budget deficit will decrease by 1.103915 percent. Conversely, if GDP falls by 1 percent, the budget deficit will increase by 1.103915 percent. If GDP increases, it will result in increased economic activity which generally occurs in the real sector and in the business world. As a result of the increase in economic activity will have an impact on increasing government revenue

through tax revenues and from increasing company profits. Increasing profits and tax revenues from these activities is the main post of domestic government revenue. So that with an increase in tax revenues obtained by the government from increased economic activity, the government's budget deficit will decrease. This argument is consistent with research by Tajul (2020), who discovered a negative and significant association between GDP and the budget deficit, with GDP growth causing a reduction in the budget deficit. This happens because the income or cash owned by the state is sufficient to meet the needs of the country.

The Relationship between Foreign Exchange Reserves and the Budget Deficit

The foreign exchange reserve variable in this study has a regression coefficient of 1.868858. The validity test reveals that foreign currency reserves significantly affect the budget deficit since the probability *t* is 0.0129, which is smaller than (10% = 0.10). A positive coefficient denotes that foreign exchange reserves have a positive effect on the budget deficit. That is, if foreign exchange reserves increase by 1 percent, the budget deficit will increase by 1.868858 percent, and vice versa. If foreign exchange reserves decrease, the budget deficit will also decrease. The condition of increasing foreign exchange reserves could occur as a result of an increasing gap in the balance of payments, forcing the government to make foreign loans to cover the problem. As a result, the condition of the government's cash will decrease because it is used to pay debts made by the government, which will cause a budget deficit.

The Relationship between Total Government Debt and the Budget Deficit

The total government debt variable in this study has a significant influence on the budget deficit. The regression coefficient on the total government debt variable is 1.133507 which means that total government debt has a positive influence on the budget deficit. The budget deficit will increase by 1.13357 percent if the total government debt increases by 1 percent. This is in line with the observations made by Michael R., Reza N. and Seyedeh Z. S. (2013) with the VAR model, the impact of budget deficit shocks will have a positive effect on total government debt in the short term. However, if the total government debt shock materializes and is disregarded, it will have a short-term negative impact on the budget deficit but a long-term has beneficial impact. So that the total government debt will have an effect in the short term, causing an increase in economic growth and a drop in the budget deficit, but a decrease in the government's economic growth over the long term. Research conducted by Benjamin (2013), shows that the amount of government debt as a whole has a positive effect on the government budget deficit. The increase in total government debt is used to cover budget deficits. In addition, the increase in debt is also used to pay off government debt that is due. If the government does not carry out debt, the government's budget deficit will decrease, but development and social welfare will also decrease because the budget deficit due to increased debt is used by the government to support development and ensure people's welfare.

The Relationship between the Exchange Rate and the Budget Deficit

The exchange rate variable in this study has a regression coefficient of 1.465505. If the exchange rate increases by 1 percent, the budget deficit will increase by 1.465505 percent. Vice versa, if the exchange rate decreases by 1 percent, then the budget deficit will also decrease by 1.465505 percent. The positive coefficient value on the exchange rate variable indicates that the exchange rate has a positive and significant influence on the budget deficit in Indonesia. The condition of the domestic exchange rate that has decreased

against the US dollar exchange rate will have an impact on increasing government burdens because the government has to pay its debts in US dollars. As a result of these conditions, the government's debt burden will increase so that the impact will also increase the government's budget deficit. This is in accordance with research conducted by Afandi (2018), using the ECM (*Error Correlations Model*) method, it can be seen that both in the long and short terms, the exchange rate has a significant and positive effect on budget deficits.

The Relationship between Inflation and the Budget Deficit

The inflation variable in this study has a negative but not significant effect on the budget deficit at the significance level α (10% = 0.10). It is not in accordance with study conducted by Alpon (2016), which states that the inflation variable has a significant influence and is positive. However, these results were in line with research conducted by Amalia (2019) which states that the inflation variable has a negative but not significant effect. Inflationary conditions if we look at it from the production side, inflationary conditions will encourage producers to increase production activities. With an increase in production activities, producers will receive income and from this income, the government will receive taxes so that government revenue will increase and will be able to reduce the budget deficit.

IMPLICATIONS

The variables of *Gross Domestic Product* (GDP), foreign exchange reserves, total government debt and the exchange rate have a significant effect on the budget deficit. GDP conditions that have increased can make the level of state's budget deficit decrease. This happens because the government can meet its needs with the cash it has. As for the foreign exchange reserve variable, the government's total debt and exchange rate increase has an impact on increasing the level of state's budget deficit. This happened because foreign exchange reserves increased due to an increase in the balance of payments gap due to import activities which could trigger an increase in government debt which could be used to reduce the balance of payments gap. Its weakening of the rupiah exchange rate against the US dollar can also result in a high level of budget deficit because to pay off debts owned by the government, the government must use foreign currency so that conditions of weakening of the exchange rate can trigger government debt and have an impact on increasing the budget deficit. Because the inflation rate could be overcome by issuing bonds to regulate the inflation rate, the inflation variable in this analysis has little bearing on the budget deficit.

CONCLUSION

Based on the research that has been done, the budget deficit condition is increasing every year due to the level of foreign exchange reserves, total government debt and the exchange rate which has also increased and inflation has no effect on the budget deficit. The condition of the increasing deficit can be suppressed if the level of government revenue increases. To reduce the number of increasing budget deficits, the government can increase tax revenues as a source of government revenue, besides that, the government can also improve economic sectors in society by supporting small and medium business programs in order to increase *Gross Domestic Product* (GDP) so that it will reduce the amount of debt owed by the government. To reduce the level of debt owned by the government so that the

budget deficit that occurs does not increase, the government can issue government bonds to increase government revenue. For researchers who will conduct research on similar issues, it is expected to use other variables or methods and add to the literature review from previous studies so that the resulting research is more *up to date*.

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