Analysis and Measurement of the Impact of Export Value, Import Value, Exchange Rate, and Inflation on Indonesia Budget Deficit 1996–2021

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Abstract. The economic development of a country requires a comprehensive policy carried out by the Government through the APBN. This policy can cause a budget deficit, where expenditure is more significant than income. It was due to high imports and declining exports, the weakening exchange rate against the dollar, and high inflation. This study analyzes and measures the impact of imports, exports, exchange rates, and inflation on Indonesia's budget deficit. The data used in this study is time series data from 1996–2021 obtained from the Indonesian Ministry of Finance, the World Bank, and Bank Indonesia. The data analysis method used is ordinary least squares (OLS). The analysis results show that exports positively and significantly affect the budget deficit. Imports have a positive and insignificant effect on the budget deficit. Meanwhile, the exchange rate and inflation negatively and significantly affect the budget deficit. Suggestions that the Government must are to perfect policies for economic development in Indonesia and future researchers to find other variables so that research is better than before.

Keywords: Budget Deficit · Export · Import · Exchange Rate · Inflation · OLS

1 Introduction

Economic development is one of the goals of developing countries, including Indonesia. Economic development is based not only on economic growth, but also on security, prosperity, and improving the quality of human resources and the environment[1]. Economic growth is a process in which the production capacity of an economy increases over time to produce greater output or income. In addition, economic growth can grow even more significantly if the government seeks new financing resources for development domestically and in a foreign country [2]. Specifically for economic development, conducive policies are needed to achieve an increase in economic growth every year according to the target.

The government carries out the fiscal policy, which is one of the policies in the economy, through the State Revenue and Expenditure Budget (APBN) instrument. State Budget is an instrument for regulating state spending and income in the context of financing the implementation of government and development activities, achieving economic

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growth, increasing national income, achieving economic stability and determining the direction and priorities of development in general [3].

During the New Order government, the government consistently implemented an expansionary fiscal policy, namely, a policy in which an increase in state spending was not followed by an increase in tax revenue as the primary source of state-financing. In theory, an expansionary fiscal policy implemented in a country to increase spending without an increase in taxes, which is one of the main revenues for government finances, will cause an increase in the budget deficit [4], besides that, it can encourage investment through increasing aggregate demand and will further encourage economic growth [5].

Governments in all countries often face the problem of sustainable budget deficits, and developing countries like Indonesia are no exception. A budget deficit occurs when the government improves public services to its people through increasing economic development by increasing government spending (government expenditure). Foreign debt is an alternative to finance the budget deficit in addition to printing money, during the old order, printing money as a deficit financing caused high inflation [6].

Most developing countries have high levels of debt, which is one of the causes of low net exports and increased imports, so foreign exchange reserves are used to pay for imports made by these countries. Foreign exchange reserves that were originally used to pay debts are used to pay for imports, so that the ability to pay debts on time decreases and causes the burden of foreign debt to increase [7].

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 that deviates from the plan, accelerating economic growth and equal distribution of people's income. Fiscal deficits can be covered by bearing domestic and foreign debt. With the existence of debt loans from within the country and abroad, it is hoped that it can spur economic growth in accordance with the previously planned targets. But this debt can also cause problems, because both domestic debt and foreign debt require returns which of course can reduce various sources of state finance [8].

Various empirical studies in Indonesia show mixed results. Research on budget deficits, including the results of [3] concluded that exchange rates have an effect on budget deficits. Meanwhile, an empirical study conducted by [4], concluded that the exchange rate did not affect the budget deficit, Empirical studies [9] conclude that foreign debt has an effect on budget deficits. Moreover, the inflation variable has a positive effect on the budget deficit. Moreover, variable economic growth rates are negatively correlated with fiscal deficits. Motivated by empirical research [10].

The budget deficit in 2019 was one of the highest deficit growths, amounting to IDR -348.65 billion, and the second highest in 2017, with a budget deficit of IDR -340.98 billion. Meanwhile, the lowest budget deficit occurred in 2008, with a budget deficit of Rp -4.121 billion, and the second lowest was in 1998 and 2001, with the same budget deficit of Rp -13.159 billion. The increase and decrease in the budget deficit were caused by tax increases which are one of the main sources of state finances.

We can see that the value of exports and imports both experienced an increase in 1997–1998, with an export value of 27.86%, increasing to 52.97% and an import value of 28.13%, rising to 43.22%. What can see is that from 1998–2021 the growth of exports and imports fluctuated; the most visible in 2020 is the growth in export-import, with the

lowest value of 17.3% for exports and 15.7% for imports. Several factors, such as the price of goods and foreign debt. Influence the increase and decrease in export-import activities. If the value of exports rises and imports fall, the country experiences a trade surplus. If the value of imports exceeds exports, the country experiences a trade deficit.

What can see is that the exchange rate from 2010 to 2012 experienced a significant increase, from 9.09 U$ to 93.8 U$. The inflation value experienced a very drastic increase in 1996–1998 from 8.68% to 75%. The relationship between the exchange rate and inflation is that if the inflation rate increases, a company's stock price will decrease, and vice versa. If the exchange rate appreciates the value of a country's currency's worth, that country's share price will also increase.

2 Literature Review

2.1 Budget Deficit

The budget deficit is planned because government expenditure is expected to exceed government receipts (G > T). This budget deficit is frequently achieved if the government wishes to stimulate economic development. It is usually done when the economy is in a slump. According to Samuelson and Nordhaus, a budget deficit is one in which spending exceeds taxes [11]. According to [12], short- and long-term budget deficits negatively link the current account. The data used the budget deficit in Indonesia for 1996–2021 from the APBN data site of the Ministry of Finance of the Republic of Indonesia in billions of rupiah.

2.2 Export

Export is the sale of goods abroad based on payment, quality, quantity, terms and other sales conditions agreed between the exporter and importer[13]. The advantage of carrying out export activities is that it can expand markets, increase the country's foreign exchange reserves and expand employment. The data used in this study are exports in Indonesia for 1996–2021 obtained from the World Bank in percentage units (%).

2.3 Import

Imports are part of the domestic demand for goods originating from abroad. Large imports of goods generally require customs interference in sending and receiving countries [14]. Imported goods must have the value of goods, shipping, insurance, usage fees, travel, transportation, and other services such as communication, construction, finance, information, business, and government services. The data used in this study are imports in Indonesia in 1996–2021 obtained from the World Bank in percentage units (%).

2.4 Exchange Rate

The means of payment for international trade transactions require a unit of currency that can be universally accepted, namely the United States Dollar. Indonesia must pay

attention to the exchange rate so there is no budget deficit [15]. Trade between countries where each has its medium of exchange requires a comparative figure in the value of another currency, called the foreign exchange rate or exchange rate [16] in [17]. Exchange rate definition A rate can also be interpreted as a contract called an exchange rate for current or future payments between currencies of different countries. The data used in this study are exchange rates in Indonesia for 1996–2021 obtained from Bank Indonesia in units of Rupiah/Dollar A.

2.5 Inflation

Inflation is a process of increasing prices in general. A continuous increase in the prices of all goods can be called inflation if only 1 or 2 goods are not necessarily inflation[18]. Factors causing inflation include high demand for an item or service, driving the price of the item or service to increase. The data used in this study is Inflation in Indonesia in 1996–2021 obtained from the World Bank in percentage units (%).

3 Research Method

To analyze and measure the effect of Exports, Imports, Exchange Rates and Inflation, the econometric model above is a combination of the econometric models [19–21]. Export, Exchange Rate (Rupiah), The data used is time series data. Sources of data obtained from the World Bank, BPS, Ministry of Finance and BI. The time series data used starts from 1996–2021 in Indonesia. Then the Ordinary Least Square (OLS) regression analysis tool is used with the econometric model as follows:

$$BD_t = \beta_0 + +\beta_1 EKS_t + \beta_2 IMP_t + LOG\beta_3 KURS_t + \beta_4 INF_t + \epsilon_t$$

Description:
BD: Budget Deficits (Milyar Rupiah)
EKS : Export (%)
IMP : Import (%)
KURS : Exchange Rate (Rupiah/Dollar AS)
INF : Inflation (%)
β_0 : Constant
$\beta_1 \ldots \beta_4$: Independent variable regression coefficient
ϵ : Error term
t: Year

4 Result and Discussion

4.1 Results

Multicollinearity testing can be seen from several variables. If Centered VIF EKS, IMP, LogKURS and INF < 10, multicollinearity does not occur. It can be concluded from the four results above that those 4 variables do not appear in multicollinearity.

Table 1. Classic assumption test results

DA_t =	-453.1158	+13.37626	+4.674456	-47.95243	-4.11961
		0.0195	0.586	0.0815	0.0581
R^2=0.67; Adj R^2= 0.61; F statistic =10.89; Prob. F statistic= 0.000061.					
Diagnosis Test					
(1) Multicollinearity (VIF)					
Eks= 7.794; IMP = 9.254; LogKurs= 1.0746; INF= 3.645					
(2) Residual Normality (Jarque Bera)					
JB= 1.529; Prob.JB= 0.465					
(3) Autocorrelation (Breusch-Godfrey)					
R-Squared=11.97; Prob C-Squared= 0.025					
(4) Heteroskedasticity (White)					
R-Squared=23.766; Prob C-Squared(14)= 0.0489					
(5) Linearity (Ramsey RESET)					
F (1,20)=12.86704; Prob. F(1,20)=0.0018					

Source : Eviews Processed
Note : *Significant at 0.01 or 1 per cent
**Significant at 0.05 or 5 per cent

The normality test will be tested with the Jarque Bera test. This test is used to determine whether the residual distribution is normal. It can be seen above that the Jarque-Bera value of 0.465 > 0.01 states that H0 is accepted and Ha is rejected. It can be concluded that the residuals are normally distributed.

The autocorrelation test was carried out on the research model using the Breusch-Godfrey test. From the data above, it can be seen that the Prob Chi-Square (2) value is 0.025. So it can be concluded that if the Prob Chi-Square (2) value is 0.025 < 0.01, then the model has a problem with autocorrelation.

The heteroscedasticity test has been carried out in this research model using the White test. The Prob value can see in the results from the table above. Obs*R-squared is 23.766, and the Prob Chi-Square (14) value is 0.0489 more than the significant value of 0.01, so in conclusion, there is no heteroscedasticity problem in the model.

The Model Specification Test used is the Ramsey Reset test. Ho accepts if the p-value (p-value), probability, or empirical statistical significance of the Ramsey Reset F test > α and H0 is rejected if the p-value (p-value), probability or practical statistical significance of the Ramsey Reset F test ≤ α. The table shows that the p-value, probability, or empirical statistical significance of the Ramsey Reset F test appears to have a value of 0.0018 < 0.10); so H0 is rejected. In conclusion, the linear model or the exact model specification.

Determinant Coefficient Test (Adj.R2) Based on the table above. We can see that the R-square value is 67.47% of the Budget Deficit variable influenced by Exports, Imports, Exchange Rates and Inflation, and the remaining 32.53% is influenced by other variables not included in the econometric model.

F test (Model Existence Test) Ho is rejected if the statistical significance of F < α, and Ho is accepted if the statistical significance of F < α. And it can be seen that the value of Prob. F-Statistic 0.000061 < 0.01, what can conclude that Ho is rejected, Ha is accepted, and then the data used exists.

T-test (Influence Validity Test) Influence can be seen in the table below:

Variable	Prob.T	Criteria	Conclution
Export	0.0195	≤ 0.05	significant at $\alpha = 0.05$
Import	0.5860	≥ 0.10	no Significant Effect
Kurs	0.0815	≤ 0.10	significant at $\alpha = 0.10$
Inflation	0.0581	≤ 0.10	significant at $\alpha = 0.10$

4.2 Discussion

4.2.1 The impact of Exports on the Budget Deficit

The selected estimation model explains that the Export variable has a positive effect, meaning that every time Exports increase, the Budget Deficit will also increase. It happens because exports are one of the countries' primary foreign exchange sources. Export activities will positively impact exporters, and in countries where the country's exports increase, the country's foreign exchange will also increase. The results of this study are consistent with research conducted by [22], which states that the effect of exports on the budget deficit is positive, where when exports increase, the budget deficit will also increase.

4.2.2 The impact of Imports on the Budget Deficit

The selected estimation model explains that the Import variable has a positive effect, meaning that every time Imports increase, the Budget Deficit will also increase. Dependence on foreign products causes the supply of raw materials to be extensive and does not meet demand, so this is what causes countries to import. More and more countries' imports will force a country's income to decrease, so with a decrease in state income, the budget deficit will be further increased. This research is in line with the study conducted by [23], in his research which states that the effect of imports on a country's budget deficit is positive Where increase in domestic materials causes an increase in the budget deficit.

4.2.3 The Impact of Exchange Rate on the Budget Deficit

The selected estimation model explains that the exchange rate variable has a negative effect, meaning that every time the exchange rate increases, the budget deficit will decrease. It shows that the rupiah's depreciation against the US dollar can increase the burden of servicing foreign debts. The results of this study need to follow the theory of the trade approach, Which states that the exchange rate equalizes the value of imports and exports from that country. If a country imports more than it exports, the exchange rate will appreciate and fall. If the Indonesian rupiah strengthens against the dollar, foreign debt will decrease, and vice versa [24]. The study is consistent with the Michelle Christian Ratings study, which states that exchange rates affect budget deficits. [25], with the title

"Analisis Determinan Defisit Anggaran dan Utang Luar Negeri". The study results show that the Exchange Rate negatively and significantly affects the budget deficit. Research by[13] concluded that the exchange rate negatively and substantially affects the Budget Deficit.

4.2.4 The Impact of Inflation on the Budget Deficit

The selected estimation model explains that the inflation variable has a negative effect, meaning that every time inflation rises, the budget deficit will decrease. It can happen because when a country experiences a price increase, it will cause people's real income to continue to be depleted because the price of goods is increasingly high, so people's living standards will also decrease. In addition, high price increases (inflation) cause the value of money to fall, and exports will also decrease so that state income will also decrease and result in chaos in economic growth and disruption of financial stability. This is what causes the budget deficit to fall due to inflation. The same research results were also carried out by [26], who stated that their research had a negative impact. [27] came to the conclusion that inflation has a significant negative impact on budget deficits.

5 Conclusion

Based on an evaluation of the impact of imports, exports, inflation, and the exchange rate (exchange rate), on the budget deficit in Indonesia from 1996 to 2021, using the ordinary least squares (OLS) regression analysis tool and using econometric models, the following conclusions are obtained:

1. The export variable positively and significantly affects Indonesia's budget deficit from 1996 to 2021.
2. The import variable has a positive effect on Indonesia's budget deficit from 1996 to 2021, but is not significant.
3. The independent exchange rate affects the dependent rate, which negatively impacts Indonesia's fiscal deficit from 1996 to 2021.
4. The inflation variable negatively and significantly affects Indonesia's budget deficit from 1996 to 2021.
5. According to the traditional assumption test, research subjects have autocratic problems, but no multicollinearity or heteroscedasticity problems exist. The normality test results reveal no deviation and imply that the residuals are normally distributed. This also confirms the definition of a valid model in linearity testing.
6. Based on the R^2 coefficient test of 67.47%, the budget eficit variable can be influenced by exports, imports, exchange rates, and inflation. And the remaining 32.53% is influenced by other variables not included in the econometric model.
7. Test F (Model Existence Test) Prob. The value of F-Statistics 0.000061 $<$ 0.01 indicates that Ho is rejected and Ha is approved, which means that the data used is there.

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