RICARDIAN EQUIVALENCE IN INDONESIA

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Abstract
Expansionary Fiscal Policy in the form of Deficit Fiscal is still being debated due to differences in views regarding the effect of budget deficits. The Ricardian Equivalence disciple argues that Deficit Fiscal Policy has a neutral impact on consumption. In contrast, Non-Ricardians (Keynesian and Neoclassical) argue that Budget Deficit Policy affects Private Consumption. Government policies affect private consumption through deficit fiscal policies such as budget deficits, government spending, taxes, and government debt. This study analyzes the effect of the fiscal deficit on consumption and observes the existence of the Ricardian Equivalence View in Indonesia. The estimation model used is the Vector Error Correction Model (VECM) through IRF and VD testing with time series data from 1980-2018. The results showed that the Budget Deficit Policy had a significant positive effect on private consumption, where the Fiscal Deficit shock was responded positively by Private Consumption. So that the Ricardian view does not apply in Indonesia and is more inclined to the Keynesian view. The positive response continues in the long term permanently, where 58.42% of the variation in the formation of the Private Consumption indicator (in period 10), is a Budget Deficit.

Keywords: Budget Deficit, Private Consumption, Ricardian Equivalence Hypothesis, Vector Error Correction Model (VECM), Keynesian, Fiscal Deficit Policies.

INTRODUCTION
A slowdown in the world economy triggered by the trade war between the United States and China has occurred. The Covid 19 pandemic that started in China further encouraged the contraction of the world economy. China is currently the second world economic power after the US. China's GDP in 2019 amounted to 13.6 trillion US dollars, while the US GDP was around 20.4 trillion US dollars. China's GDP increase is more significant than the increase in US GDP in the space of 16 years. In 2003 China's GDP amounted to 1.7 trillion US dollars, only one-seventh of US GDP, then in 2019, US GDP was only 1.5 times China's GDP.

From the perspective of international trade, China's exports and imports amounted to 4.6 trillion US dollars, more significant than the US, which is only 4.3 trillion US dollars. China is the largest importer of goods from the US, Japan, and India. Imports from these three countries, exceed China's imports from other countries. The European Union and Brazil, as other world economic powers recorded the largest export value is
to China. In addition, the growth of the world tourism industry is heavily influenced by China. Every year about 150 million Chinese travels abroad with spending about $277 billion more than the U.S. which only reaches 144 billion U.S. dollars. Referring to the data, there is no denying, China has a very large influence on the condition of the world economy. A weakening Chinese economy will encourage the weakening of the world economy, the Chinese economy will improve, the Chinese economy will encourage the improvement of the world economy.

The coronavirus phenomenon that has hit China since the beginning of 2020 will further worsen China's economic performance. It is certain that economic growth will decrease to the level of 5% or below. The slowdown in China's manufacturing industry, the decline in tourists from China, the decline in fuel consumption and also the decline in Chinese imports can be very drastic. The impact will be felt for the world economy due to the importance of China's position in international trade.

Indonesia's economy will definitely be affected. From the perspective of exporting the largest export destinations of Indonesia to ASEAN countries at 21.51%, then China at 15.14%, the US at 10.79, the European Union at 10.58%, and Japan at 10.23%. The slowdown in the economies of China, the US, the European Union will certainly have a very significant impact on Indonesia's export performance plus dependence on imports of raw materials from these countries, especially China will worsen the performance of the manufacturing industry. The tourism sector will feel a significant impact considering that about 2.1 million tourists or 13.3% come from China.

The Covid-19 pandemic that also hit Indonesia further exacerbated the economic slowdown. The consumption, investment and export sectors are expected to decline and will further impact the decline in economic growth. To overcome the economic slowdown so that the acceleration of the economic slowdown does not occur, the Indonesian government, both through Fiscal and Monetary policy conducts policies that are counter-cyclical.

Perppu No. 1 of 2020 is a government policy to overcome the impact of the Covid-19 pandemic on the economy. Perppu to be issued by the Government contains extraordinary policies and measures in saving the national economy and financial system stability through various relaxations related to the implementation of the 2020 State Budget and strengthening the authority of various institutions in the financial sector. The total additional spending and financing of the 2020 State Budget for the handling of Covid-19 is Rp.405.1 trillion, Rp.75 trillion for health, Rp.110 trillion for Social Safety Net, Rp.70.1 trillion for tax incentives and KUR stimulus, and Rp.150 trillion is allocated for the financing of national economic recovery programs, including credit restructuring and underwriting and financing for MSMEs and businesses to maintain resilience and economic recovery.

Health is the first priority, while the second priority is the preparation of the budget for the social protection of the Family Hope Program (PKH) of 10 million recipients, Community Empowerment Cadres (KPM), paid monthly from April 2020 (so that
annual assistance is up 25%). The sembako card was raised from 15.2 million to 20 million recipients, with benefits rising from Rp.150,000 to Rp. 200,000 for 9 months (up 33 percent). The Pre-employment Card was raised from 10 T to 20 trillion to cover about 5.6 million informal workers, micro and small businesses. Beneficiaries get a post-training incentive of Rp 600 thousand, with a training cost of 1 million. 3- month electricity fee exemption for 24 million 450VA electricity customers, and 50% discount for 7 million subsidized 900VA customers. Additional housing incentives for the construction of Low-Income Community (MBR) housing up to 175 thousand. Logistics support of sembako and basic needs 25 trillion.

The third priority is the preparation of budget for the business world in the framework of economic recovery PPH 21 workers of the processing industry sector with a maximum income of 200 million a year borne by the government 100%. Exemption of Import PPH for 19 specific sectors, Export Destination Ease of Import Taxpayer (KITE) and KITE Taxpayer of Small and Medium Industries. Reduction of PPH 25 by 30% for certain sectors. Ease of Import Export Destination (KITE) and KITE taxpayers small and medium-sized industries. VAT restitution is accelerated for 19 specific sectors to maintain the liquidity of business actors. Delay in principal and interest payments for all KUR schemes affected by COVID-19 for 6 months.

The expansionary fiscal policy carried out by the government is expected to encourage consumption, investment and exports. Nevertheless, there has been disagreement over the impact of expansionary fiscal policy on consumption as explained by the Ricardian and Non-Ricardian views. Ricardian's view states that the expansionary fiscal policy, a budget deficit financed with government debt will not have an impact on the economy. The non-Ricardian Keynesian view states that the fiscal policy will increase national consumption and income, while non-Ricardian Neoclassical views that fiscal policy will actually increase consumption and national income, lowering national consumption and income (Barro 1974, 1987).

Fiscal deficit policy in the form of increasing government budget deficit has been a lot of discussion as well as a topic of research, both theoretically and empirically because budget deficits are often considered to affect macroeconomic conditions. The fiscal deficit policy that has been discussed up front actually has two meanings, namely tax cuts and the implementation of budget deficits. Ideally, the government finances all its spending with tax revenues, but if the tax revenue after supplemented by non-tax revenues, lower than government spending, then the government has a budget deficit (Barro, 1974). So that in financing its expenditure, the government must owe, both from within the country and abroad.

Based on that background, expansionary fiscal policies in recessionary conditions must be effective in increasing national income or economic growth. Increased national income or economic growth can occur through increased consumption. Households’ views on fiscal policy are not always the same, so expansionary fiscal policy is unlikely to have an impact on rising consumption or national income. Theoretically it is also reinforced by Ricardian and Non-Ricardian p andangan. This is
a problem that must be proven empirically to support or become a scientific consideration for fiscal policy so that the policy is useful.

With regard to these problems, the research question is how the Ricardian phenomenon is present in fiscal in Indonesia. Therefore, the goal of this study is to prove empirically the existence of the Ricardian phenomenon in fiscal in Don esia. The results of this study can further be used by the government in conducting expansionary fiscal policy.

LITERATURE REVIEW

Theoretical Foundation
There are three main views on the study of budget deficits as summarized based on research, namely Ricardian Equivalence, Keynesian Proposition and Neoclassical views (Bernheim, 1989). Ricardian equivalence is a view studied by Barro (1974, 1987), and Cheng (1998). The Ricardian Equivalence perspective argues that fiscal deficit policy through tax reductions will have no impact on household consumption because it is possible that households will respond to tax reduction policies by increasing household savings aimed at anticipating future tax increases. Therefore, fiscal deficit policy has no effect on economic growth in aggregate (Vamvoukas, 2008).

Re's view first emerged as an alternative opinion from previous research on the financial condition of the United States that at that time used fiscal deficit policy. At that time, the existing budget deficit is predicted to have a bad effect on the economy because fiscal deficit policy is believed to increase interest rates and can eventually crowd out investment. But it turns out that the U.S. economy is experiencing the opposite of experts' predictions. As Barro said (1989), after the budget deficit policy, real and nominal interest rates of the United States decreased, so investment increased rapidly and ultimately brought pnb growth (GNP growth).

The Ricardian Equivalence Hypothesis (REH), has five underlying assumptions, namely lumpsum tax, absence of liquidity constraints, full employment, far-sighted and rational individuals, and intragenerational transfer. But this argument then is still difficult to prove and has many weaknesses. Some examples are the circumstances that man does not live forever (limited) so it is possible that future tax increases are not imposed on an economic actor as long as he lives. Thus, economic actors have no reason to increase their savings as compensation for future tax increases. This is what causes REH is still widely debated (Adji, 1995).

The second view is the Keynesian Proposition and the Neoclassical. Both views agree that fiscal deficit policy with tax reductions affects the economy through its implications for public consumption, interest rates, and aggregate demand. But these two views have differences, Keynesian views state the positive impact of interconnected deficits and the economy, through increased consumption. Budget deficit policies in the form of tax cuts can have an impact on the economy through increased private consumption which in the short term will encourage aggregate demand for
goods and services. (Mankiw, 1992). Neoclassical views believe that the two have a negative relationship. Based on his thesis, Maryatmo (2005) stated that with fiscal deficit policy, there will be a tax reduction that will then increase interest rates due to declining savings. This increase in interest rates will then crowding-out investment. In classical and Keynesian view, the decline in investment caused by rising interest rates will also have an impact on reducing capital stocks and cause economic growth in the long run to be not optimal (Waluyo, 2006).

The budget deficit to be discussed in this study has two forming components, namely the primary deficit and the interest payment component on debt (Dornbusch, 1989, Maryatmo, 2005). Primary deficit is defined as the negative difference from the reduction in government revenue and spending and does not include the interest burden on debt. Budget deficits are chosen rather than primary deficits because the debt repayment component contained in the budget deficit is intended to look at the role of debt burden in government budgets (Maryatmo, 2005). Where if the burden of government debt increases and is accompanied by an increase in high borrowing rates will encourage interest payments on debt that will be higher as well. This increasingly high interest payment will eventually have an impact on increasing the amount of the budget deficit. The increase in the budget deficit will then affect the economy.

Based on Seater (1993), there is a development of two fundamental approaches used by repositioning, namely, government budget constraints and PIH (Permanent Income Hypothesis). Government budget constraints state that if government spending does not change then the low tax rate will now be offset by a later increase in the tax rate. While PIH states that economic actors base their consumption decisions on permanent income which is very dependent on the present value of income after tax. The current fiscal deficit policy of tax cuts will have an effect on increasing the tax burden in the future but has no effect on the present value. So that this tax cut will not change permanent income or consumption (Elmendorf et al, 1998, Waluyo, 2006). There is nothing like "free lunch" in this world, where according to the Ricardian preposition, the budget deficit is merely a transfer of the tax burden to the future at the same rate as the present. If the fiscal deficit policy in the form of tax reductions balanced by an increase in government debt has no effect on macroeconomics, then the government can increase revenue by issuing more debt. However, keep in mind that the issuance of debt (government bond) will also automatically produce interest expense that must be paid in the future (Adji, 1995).

Ricardian is built on the basis that bond issuance as a source of government debt financing will be compensated by future tax increases. Government debt is equivalent to future taxes (Barro, 1989, Mankiw, 2007). The general principle of the Ricardian is that debt-funded tax cuts do not affect consumption. Changes in taxes and deficit financing have had similar impacts on economic variables, particularly private consumption. Households will save excess disposable income in anticipation of future tax payments. Where economic actors are considered to have altruistic traits. Although it does not live forever and it is possible that tax increases do not occur while they live,
parents will leave an inheritance for their children in anticipation of future tax increases. This increase in household savings will replace the reduction in public savings caused by the implementation of fiscal deficit policies, so that the amount of national savings remains the same. That way, tax cuts or increasing government debt have no impact on the economy (Mankiw, 2007).

Asumsi Ricardian regarding an economy that adheres to intergenerational altruism and immortality, then the budget deficit has no effect on the economy. So that rational economic actors will not increase consumption with the policy of tax reduction. However, in reality, economic actors do not live forever and are not in the infinite horizon. This is a deficiency of Ricardian Equivalence.

**Previous Research**

Joko Waluyo (2006) researched RE as the influence of Indonesia's government deficit financing from 1970 to 2003. In his research, Waluyo used the assumption of the makro model that is open but small, or small open economy. The model used, has been specificationed in his research in 2005, which uses 6 blocks: production blocks, real sector blocks, government sector blocks, monetary sector blocks, price blocks, and balance of payments blocks. The model is estimated to use two stages least squares (TSLS). The estimate results suggest that the reduction in private consumption in the past has an impact on the increasing tax revenue in the current period, because the private sector anticipates tax increases in this period by increasing savings in the past period, so that private consumption is also reduced. Waluyo (2006) also explained that budget deficit financing using foreign debt and bond issuance will increase national GDP income, but will still have a neutral impact on people's wealth.

Wardono et al (2019) was conducted with the same estimation method, Two Stage Least Square (TSLS) and with the same result that indicates the preposition of RE in Indonesia. The difference that seeks to be shown is the longer research period (1969 - 2013) and in addition in the study explained that the authors divided the research year into two periods based on differences in the balance sheet format of the state budget when the Suharto regime, New Order (T-account) was notated with dummy variables (0) and post-crisis periods or reforms, starting in 2000 (I-account) with dummy variables (1). Contrary to Keynesian theory that an increase in income due to tax reductions can increase private consumption, the study found that an increase in the budget deficit could not stimulate an increase in domestic consumption, even if there was a change in domestic consumption, the variable that increased was government consumption (in the form of payment on debt), not private consumption. But public consumption due to repayments on loans in this study did not show great significance, because most government expenditure is allocated to regular expenditures instead of interest payments. The study concluded that it agrees with the existence of RE in Indonesia, because the components of the fiscal deficit do not affect domestic consumption significantly.

Adji (2016) expressed differences in results and opinions from the research of Joko Waluya and Wardono. Adji (2016) states that the PHENOMENON of RE does not
apply in Indonesia, while the prevailing is keynesian view. This study uses the ECM method with Indonesian time series data from the period 1972-2003. First, in relation to consumption, the budget deficit in the form of government debt has a positive and significant effect on consumption, thus breaking the Ricardian theory. In addition, government expenditure also significantly affects and again proves that RE in Indonesia is invalid. This is because there is a bagof government spending is forhousehold subsidies. So that the increase in government debt will increase the amount of government spending on subsidies, and disposable income that can be consumed by households becomes increasing. The second, in relation to interest rates shown in research that deficits and debt increased interest rates from the period 1972-2003. It does not show in line with the Ricardian theory that deficit policy does not affect the economy through consumption and interest rates.

RESEARCH METHODS

Operational Definition of Variables
This study used 5 (five) variables as indicators of research. The first variable, private consumption is household consumption, consumer spending on goods and services, but does not include the purchase of a house or place to live. Second, variable Government Spending or Expenditure consists of central government spending and transfers to the region. Then followed by the variable Budget Deficit which is the difference between government spending that is greater than government revenue, both tax and non-tax revenue. The budget deficit used is not a primary balance, but the budget deficit figure is obtained based on the adjusted annual state budget posture (LKPP). Variable Tax Revenue is the state income earned from tax levies. In the study, researchers used only tax revenue and not overall state revenue. The last variable is Government Debt, both domestic debt in the form of SBN and external sources such as foreign debt related to the financing of the state budget deficit.

Methods of Data Collection
The data used in this study is secondary data in the form of time series data. The data used has a span of 38 years starting from 1980 - 2018. Private consumption data is taken from the World Bank's data catalog which can be accessed through the official website of the www.data.worldbank.org. The available data is in the form of percentage (%) which is then processed into nominal numbers in US Dollars assuming calculations using National Income data. Budget Deficit data obtained from the Ministry of Finance and has been processed into annual data with some assumptions for the years 1980 - 2000. Data on government expenditures and tax revenues is obtained through the Ministry of Finance by accessing the apbn data web. Data on government debt is taken based on data from Bank Indonesia and the Directorate General of Financing and Risk Management.

Methods of Data Analysis
In calculating and analyzing data, researchers use data that is time series, so vector autoregression or VAR is used as a method of data analysis. The VAR method is used
to detect causality between variables – variables are used dynamically and can describe economic fluctuations. In addition, this study is a study of macroeconomic fiscal policy on developments in the real sector through a mechanism that generally does not have an immediate impact, usually requires a certain grace period, or so-called lag. Some of the above problems can be answered using the VAR/VECM model (Basuki, Agus Tri, 2015).

The VAR method that will be used as a test method in this study is divided into several important stages such as in Graph 1, as follows:

a. Stationary Test
In research using time series data, the most important thing is to test the stationarity of the data to be used. Data is called stationary when the data has a constant average and variety throughout the time of observation (Basuki, 2015). If it turns out that the data used is non-stationary, then the regression results that can be biased, where the effect of shock or error will occur throughout the period and will cause spurious regression. Spurious regression is what will cause the $R^2$ t-ratio and F stat to become invalid (Toedjono, 2017). This stationarity test can be used stationarity test or Dickey-Fuller root unit test introduced by Dickey and Fuller (1979). The Dicky Fuller test can be explained as follows:

$$y_t = \phi y_{t-1} + u_t$$  \hspace{1cm} (3.1)

The Dickey-Fuller standard procedure and specification are based on the following equations by reducing both sides of the equation by obtaining: $yt-1$

$$y_t - y_{t-1} = \phi y_{t-1} - y_{t-1} + u_t$$
The hypothesis is as follows:

\( H_0 : \psi = 0, \text{data memiliki unit root (tidak stasioner)} \)

\( H_1 : \psi < 0, \text{data tidak memiliki unit root (stasioner)} \)

Dickey-Fuller testing is considered valid if the error of the two equations above does not indicate the presence of autocorrelation (white noise). To ascertain and resolve the existence of autocorrelation problems, the model expansion procedure, or Augmented Dickey Fuller (ADF) can be done with the following equations

\[ \Delta y_t = y + ay_{t-1} + \sum_{s=1}^{m} a_s \Delta y_{t-s} + u_t \quad (3.3) \]

\[ \Delta y_{t-1} \] It can be subsubstituted to where lag in I (1) can be subsubtused as much as possible to ensure that \( \Delta y_{t-1} = (y_{t-1} - y_{t-2}) \), \( \Delta y_{t-2} = (y_{t-1} - y_{t-2}) \), \( \ldots \) \( \ldots \) residuals are not correlated. If the data is stationary at level I (0), it can use VAR level I (0). If the data is not stationary in first difference I (1), var I (1) can be used. If the data is not stationary, it will be tested to determine the use of VECM (Vector Error Correction Model).

b. Determination of Optimum Lag

After ensuring that the data used is stationary, the optimum lag determination will be done in VAR testing. Estimates of VAR with a different amount of lag length to lag length will actually cause var estimates to be inconsistent (Braun & Mitnik, 1993). To determine the amount of lag to be used in the VAR model can be determined based on the criteria of the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). The lag criteria selected in the study were the models with the smallest grades from AIC and SIC.

c. Vector Autoregressive Model (VAR)

The approach to the VAR model is a series of multivariate time series models developed by Sims (1998). The VAR model is a regression equation consisting of more than one variable dependent. In the VAR model, all variables used in the analysis are considered potentially endogenous variables, ignoring the separation between exogenous variables and endogenous variables or in the sense that all variables can be dependent or independent variables. One of the simplest VAR models is the bivariate VAR model which consists of 2 (two) Variables and each value depends on the combination of \( y_{1t} \) \( y_{2t} \) values of both variables in the past and the error term (Grace, 2019).

\[ y_{1t} = \beta_{10} + \beta_{11}y_{1t-1} + \beta_{12}y_{2t-1} + u_{1t} \quad (3.4) \]

\[ y_{2t} = \beta_{20} + \beta_{21}y_{1t-1} + \beta_{22}y_{2t-1} + u_{2t} \quad (3.5) \]

or


\[
\begin{bmatrix}
\gamma_1 \\
\gamma_2
\end{bmatrix} =
\begin{bmatrix}
\beta_{10} & \beta_{11} & \beta_{12} \\
\beta_{20} & \beta_{21} & \beta_{22}
\end{bmatrix}
\begin{bmatrix}
\gamma_{1t-1} \\
\gamma_{2t-1}
\end{bmatrix} + \begin{bmatrix}
\delta_{1t} \\
\delta_{2t}
\end{bmatrix}
\]

(3.6)

Please note that VAR has the advantage of being very flexible and easy in generalization, so VAR can be easily modified as needed where the number of variables can be added, and (Toedjono, 2017). $y_{1t}y_{2t}$

Using the VAR model above, the author modified the VAR model into the following:

\[
C_t = \alpha_{10} + \sum_{k=1}^{K_1} \alpha_{1k} C_{t-k} + \sum_{k=1}^{K_2} \gamma_{1k} Y_{t-k} + \sum_{k=1}^{K_3} \delta_{1k} G_{t-k} + \sum_{k=1}^{K_4} \eta_{1k} DEF_{t-k} + \sum_{k=1}^{K_5} \theta_{1k} T_{t-k} + \sum_{k=1}^{K_6} \lambda_{1k} D_{t-k} + \varepsilon_{1t}
\]

(3.7)

\[
Y_t = \alpha_{20} + \sum_{k=1}^{K_1} \alpha_{2k} C_{t-k} + \sum_{k=1}^{K_2} \gamma_{2k} Y_{t-k} + \sum_{k=1}^{K_3} \delta_{2k} G_{t-k} + \sum_{k=1}^{K_4} \eta_{2k} DEF_{t-k} + \sum_{k=1}^{K_5} \theta_{2k} T_{t-k} + \sum_{k=1}^{K_6} \lambda_{2k} D_{t-k} + \varepsilon_{2t}
\]

(3.8)

\[
DEF_t = \alpha_{30} + \sum_{k=1}^{K_1} \alpha_{3k} C_{t-k} + \sum_{k=1}^{K_2} \gamma_{3k} Y_{t-k} + \sum_{k=1}^{K_3} \delta_{3k} G_{t-k} + \sum_{k=1}^{K_4} \eta_{3k} DEF_{t-k} + \sum_{k=1}^{K_5} \theta_{3k} T_{t-k} + \sum_{k=1}^{K_6} \lambda_{3k} D_{t-k} + \varepsilon_{3t}
\]

(3.9)

\[
T_t = \alpha_{40} + \sum_{k=1}^{K_1} \alpha_{4k} C_{t-k} + \sum_{k=1}^{K_2} \gamma_{4k} Y_{t-k} + \sum_{k=1}^{K_3} \delta_{4k} G_{t-k} + \sum_{k=1}^{K_4} \eta_{4k} DEF_{t-k} + \sum_{k=1}^{K_5} \theta_{4k} T_{t-k} + \sum_{k=1}^{K_6} \lambda_{4k} D_{t-k} + \varepsilon_{4t}
\]

(3.10)

\[
D_t = \alpha_{50} + \sum_{k=1}^{K_1} \alpha_{5k} C_{t-k} + \sum_{k=1}^{K_2} \gamma_{5k} Y_{t-k} + \sum_{k=1}^{K_3} \delta_{5k} G_{t-k} + \sum_{k=1}^{K_4} \eta_{5k} DEF_{t-k} + \sum_{k=1}^{K_5} \theta_{5k} T_{t-k} + \sum_{k=1}^{K_6} \lambda_{5k} D_{t-k} + \varepsilon_{5t}
\]

(3.11)

Where $C_t$ is the total household consumption (private consumption), $Y_t$ is national income noted with real GDP, is government expenditure or expenditure, describing the annual budget deficit based on the state budget every year, is government revenue in the form of tax (tax$G_t$DEF$T_t$ revenue), $D_t$ is government debt or government debt. The equation (3.7) above illustrates that household consumption is influenced by household consumption in the previous period, national income of the previous period, government expenditure of the previous period, budget deficit of the previous period, tax receipts of the previous period and government debt of the previous period. Then, to make it simpler the model is arranged in the form of a polynomial matrix as follows:

\[
\begin{bmatrix}
C_t \\
Y_t \\
G_t \\
DEF_t \\
T_t \\
D_t
\end{bmatrix} =
\begin{bmatrix}
\alpha_1(L) & \gamma_1(L) & \delta_1(L) & \eta_1(L) & \theta_1(L) & \lambda_1(L) \\
\alpha_2(L) & \gamma_2(L) & \delta_2(L) & \eta_2(L) & \theta_2(L) & \lambda_2(L) \\
\alpha_3(L) & \gamma_3(L) & \delta_3(L) & \eta_3(L) & \theta_3(L) & \lambda_3(L) \\
\alpha_4(L) & \gamma_4(L) & \delta_4(L) & \eta_4(L) & \theta_4(L) & \lambda_4(L) \\
\alpha_5(L) & \gamma_5(L) & \delta_5(L) & \eta_5(L) & \theta_5(L) & \lambda_5(L) \\
\alpha_6(L) & \gamma_6(L) & \delta_6(L) & \eta_6(L) & \theta_6(L) & \lambda_6(L)
\end{bmatrix}
\begin{bmatrix}
C_t \\
Y_t \\
G_t \\
DEF_t \\
T_t \\
D_t
\end{bmatrix} + \begin{bmatrix}
\varepsilon_{1t} \\
\varepsilon_{2t} \\
\varepsilon_{3t} \\
\varepsilon_{4t} \\
\varepsilon_{5t} \\
\varepsilon_{6t}
\end{bmatrix}
\]

Where $L$ is the

(3.12)

d. Interpretation of VAR/VECM Model

i. Causality Test: Granger Causality Test

In research with the VAR model, the causality test is intended to determine which variables will affect and which variables will be affected. This is because
in VAR / VECM can explain the process of generalization variables simultaneously (there are no endogenous and exogenous variables). The causality test, or relationship between variables, can be explained using granger causality proposed by Granger (1969).

Granger states causal $y_{2t}$ variables by if the information in the past and present of the variable $y_{1t}$ can $y_{2t}$ help in carrying out the variable forecast. $y_{1t}$ Furthermore, causality relationships can be tested through the following F-tests:

$$F = \frac{(RSS_p - RSS_{ur})/m}{RSS_{ur}/(n-k)} \quad (3.13)$$

**ii. Impulse Response Function**

Causality testing in VAR can indicate which variables in the model have a significant impact on other variables in the system. But causality testing cannot explain the effect of changes in certain variables on other variables, whether positive or negative, and cannot show how long those influences will work in the system. Therefore, impulse response and variance decomposition are used in the next stage of testing.

In the VAR model, the impulse response function (IRF) can identify the shock responsiveness of the variable dependent to other variables in the system. Basically, IRF will describe the path(path) where a variable will return to its original position after being "given" shock. By looking at the bivariate VAR model I(0) in the equation (3.4, 3.5) then the possibility of shock is influential, and and produces the following assumptions: $y_1, y_2$

Assume the case with shock to, then and to $t > 1$. $y_1 u_{1}^1 = \sigma y_1, u_{2}^1 = 0 u_{2}^2 = 0$

so

When $t = 1$,

$$y_{11} = u_{1}^1 = \sigma y_1 > \text{the effects of shock on } y_{1t}$$

$$y_{21} = u_{2}^1 = 0 > \text{the effects of shock on } y_{2t}$$

When $t = 2$,

The effect of shock on $y_{1t}$:

$$y_{12} = \beta_{11} y_{11} + \beta_{12} y_{21} = \beta_{11} \sigma y_1 + \beta_{12} 0 = \beta_{11} \sigma y_1 \quad (3.14)$$

The effect of shock on $y_{2t}$:

$$y_{22} = \beta_{21} y_{21} + \beta_{22} y_{22} = \beta_{21} \sigma y_1 + \beta_{22} 0 = \beta_{21} \sigma y_1 \quad (3.15)$$

At the time $t = 3$,

$$y_{13} = \beta_{11} y_{12} + \beta_{12} y_{22} = \beta_{11} \beta_{11} \sigma y_1 + \beta_{12} \beta_{21} \sigma y_1 \quad (3.16)$$
\[ y_{23} = \beta_{21}y_{12} + \beta_{22}y_{22} = \beta_{21}\beta_{11}\sigma y_1 + \beta_{22}\beta_{21}\sigma y_1 \] (3.17)

So, with the above pattern, it can be concluded that IRF shock from the end is, and IRF \( y, y, \sigma y_1 \{1, \beta_{11}, (\beta_{11} + \beta_{12}), \ldots\} \) shock \( y_1 \) to is, \( y_2, \sigma y_1 \{0, \beta_{21}, (\beta_{22} + \beta_{21}), \ldots\} \)

iii. Variance Decomposition

Variance decomposition is another way that can be used to see the movement of shock. With variance decomposition, you can see the contribution of each type of variable dependent shock to forecast error variance (Carter Hill, 2011). Variance decomposition will determine how much forecast error of a variable is explained by its own shock (Grace, 2019).

e. Kointegration Test

Variables will be said to integrate if the linear combination of variables is stationary I(1) (Engel & Granger, 1987). There are often time series data that are not stationary showing simultaneous movements all the time. It is influenced by the relationship interrelationships in the long term between variables. Engel & Granger (1987) explains that cointegration is closely related to determining a long-term relationship or long-term balance of a variable. Some of the methods used to test the presence of cointegration are Engel & Granger as well as Johansen Cointegration.

i. Engel-Granger Two Step Method

One of the cointegration tests conducted using the Engel-Granger concept is the two-step method. This method is a single equation technique with the following steps:

Step 1, ensures that all variables are stationary at I(1), and estimates cointegrating regression using OLS; this stage is used to see the estimated value of residual parameters and ensure that it is stationary at I(0). Step 2, use residual in Step 1 as one of \( \hat{u}_t \) the variables in the Error Correction Model (ECM) equation where:

\[ \Delta y_t = \beta_1 \Delta u_t + \beta_1 (\hat{u}_{t-1}) + v_t \] (3.18)

Where, \( = (\hat{u}_{t-1}) (y_{t-1}) \sigma^2 \)

This linear combination of stationary forms is called cointegrating vector or in this case is \( \mu \). And the hypothesis is tested as follows: \( (1 - \mu) \).

\( H_0 : \hat{u}_t \sim I (0) \rightarrow \) tidak ada kointegrasi

\( H_1 : \hat{u}_t \sim I (1) \rightarrow \) ada kointegrasi

ii. Johansen Cointegration Test

In addition to Engle-Granger, another test that can be used to test the presence of cointegration is the Johansen Cointegration Test. This model can be used as
Ricardian Equivalence In Indonesia

179

an alternative to overcome some of the parameter estimation weaknesses in Engle-Granger. There can be a possibility of simultaneous equation bias if there is bidirectional causality between y and x. In single equations such as the equations used in Engle-Granger, y and x are treated asymmetry. This error stems from a mis-specificization of the equation in step 1 which then carries over to the actual cointegration test in step 2. This is inevitable because in step 1 it is not possible to do hypothesis testing about the actual cointegration relationship (Grace, 2019).

This problem is what is trying to be avoided in the testing of cointegration using Engle-Granger. This weakness can be overcome by testing using the Johansen method where the testing approach is based on the estimation of the VAR system

RESULT AND DISCUSSION

Stationary Test of Each Variable
Research on stationarity is an important stage in time series analysis that aims to find out whether in the data used there are root units or not. The existence of a direct root unit must be ensured that there is no relationship between variables in the equation to be valid and unbiased.

Data stationarity testing uses the Dicky-Fuller Augmented method (ADF) by comparing its statistical values indicated by its t-statistic coefficient. Stationary data is indicated by the absolute value of ADF stat > absolute critical value at the α level: 5%. In this study, Table 1 shows that all variables cannot be said to be stationary at level I (0) where only variable tax revenues and budget deficits do not have root units at level I (0).

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF statistics</th>
<th>Mc-Kinon Critical Value 5%</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Consumption</td>
<td>-1.019313</td>
<td>-3.536601</td>
<td>Not stationary</td>
</tr>
<tr>
<td>Government spending</td>
<td>0.353098</td>
<td>-3.536601</td>
<td>Not stationary</td>
</tr>
<tr>
<td>Budget Deficit</td>
<td>-3.780792</td>
<td>-3.536601</td>
<td>Stationary</td>
</tr>
<tr>
<td>Tax Revenue</td>
<td>-4.420042</td>
<td>-3.536601</td>
<td>Stationary</td>
</tr>
<tr>
<td>Government Debt</td>
<td>-0.168206</td>
<td>-3.536601</td>
<td>Not stationary</td>
</tr>
</tbody>
</table>

Source: E-views processed data

Since there is no stationarity in the test at the level, the root unit testing of all Variables will be continued by conducting the root unit test at the first difference level. In Table 2, all stationary variables in I (1) where the absolute value of ADF
stat > the critical value of MC Kinon. Thus, the H0 hypothesis can be rejected.

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF statistics</th>
<th>Mc-Kinnon Critical Value</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Consumption</td>
<td>-4.883548</td>
<td>-3.536601</td>
<td>Stationary</td>
</tr>
<tr>
<td>Government spending</td>
<td>-5.431314</td>
<td>-3.536601</td>
<td>Stationary</td>
</tr>
<tr>
<td>Budget Deficit</td>
<td>-7.407269</td>
<td>-3.536601</td>
<td>Stationary</td>
</tr>
<tr>
<td>Tax Revenue</td>
<td>-6.441211</td>
<td>-3.536601</td>
<td>Stationary</td>
</tr>
<tr>
<td>Government Debt</td>
<td>-3.673517</td>
<td>-3.536601</td>
<td>Stationary</td>
</tr>
</tbody>
</table>

Source: E-views processed data

From the results of the stationarity test that has been done above, all variable data used is stationary in the first difference, so there is a need for a cointegration test to get the results of the model using VAR on first difference or VECM.

**Optimum Lag Determination**

Determining the optimum lag of the VAR model should look at the stability of the model, where the VAR system is said to be stable if the entire roots have a modulus smaller than 1 and all are located in a circle unit.

Source: Processed E-views data

**Figure 2**

*Inverse Root of AR Characteristic Polynomial*

To determine the optimum lag the author uses 2 (two) main criteria contained in the lag length criteria, namely Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). At any given moment, the Hannan-Quin criteria can also
be used. *The optimum lag* used in this study was found in lag 2 with the following results:

Table 3

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-2080.120</td>
<td>NA</td>
<td>1.40e+44</td>
<td>115.8400</td>
<td>116.0599*</td>
<td>115.9167</td>
</tr>
<tr>
<td>1</td>
<td>-2037.785</td>
<td>70.55752</td>
<td>5.43e+43</td>
<td>114.8769</td>
<td>116.1965</td>
<td>115.3375</td>
</tr>
<tr>
<td>2</td>
<td>-2004.381</td>
<td>46.39452*</td>
<td>3.71e+43*</td>
<td>114.4101*</td>
<td>116.8293</td>
<td>115.2544*</td>
</tr>
</tbody>
</table>

*Source: Processed E-views data*

**Kointegration Test**

Due to the existence of stationary research variables at level I (0), it is necessary to test cointegration given the possibility of cointegration relationship between variables. If later indicated that the data integrates, then data analysis will be done using VECM. And if the data does not integrate, it will be analyzed using VAR in *the first difference*.

The cointegration test can be performed using the *Johansen Cointegration Test* by using an optimum lag length of 2 (Table IV.3). Table IV.4 follows the results of the *Johansen Cointegration* test that will be used to determine the number of cointegration equations contained in the system. If *the trace statistic* and *Max-Eigen* are greater than the critical *value*, then the problem is integrated. In the cointegration test, hypothesis zero (H0) is non-integrating and the alternative hypothesis (H1) is the integrated equation.

Table 4

Unrestricted Cointegration Rank Test (Trace)

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Trace</th>
<th>0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of CE(s)</td>
<td>Eigenvalue</td>
<td>Statistics</td>
</tr>
<tr>
<td>None *</td>
<td>0.606457</td>
<td>93.98334</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.547598</td>
<td>61.34357</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.484909</td>
<td>33.58210</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.254988</td>
<td>10.36270</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.001721</td>
<td>0.060286</td>
</tr>
</tbody>
</table>

*Johansen Cointegration Test Results*
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Max-Eigen</th>
<th>0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of CE(s)</td>
<td>Eigenvalue</td>
<td>Statistics</td>
</tr>
<tr>
<td>None</td>
<td>0.606457</td>
<td>32.63977</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.547598</td>
<td>27.76146</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.484909</td>
<td>23.21940</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.254988</td>
<td>10.30241</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.001721</td>
<td>0.060286</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

In the results of the trace statistics above, it can be known that there are 3 cointegration vectors. Where the trace statistic is greater than the critical value, then the H0 hypothesis can be rejected, which means there is a cointegration among 3 of the 5 vectors tested. For max-eigenvalue testing, there are only 2 vectors that can be said to integrate. However, for decision-making the integration of authors uses trace statistics, such as Johansen’s recommendation. So that the decision can be taken that there is a relationship between variables in the long run.

VECM Estimate

In the previous sub-chapters have been tested for the presence or absence of cointegration in the equation, the results show that there is a significant long-term relationship between variables, so the VECM research method will be used in the study. Based on the results displayed, all variables have a varied relationship. Variative itself is intended that there are some variables that have a significant influence, but there are some variables that do not affect the and cannot explain other variables.

Hypothesis

H0: Dependent variables are significantly unaffected by independent variables

H1: Dependent variables are significantly affected by independent variables

T test for each variable

$t$-table = $df(n-K)5% = df(39-5)5% = 2.032$

So

If the $t$-statistic > $t$-table, significant and reject $H_0$
If the t-statistic < t-table, it is insignificant and cannot reject $H_0$.

a. **Vector Error Correction Model (VECM)** Private Consumption \([\text{CONS}]\) In the long run

\[
\text{CONS} = -0.438002 \text{GOV EXP} + (-1.283236) \text{BUDGET DEFICIT} + (-0.100104) \text{TAX INC} + (-0.591323) \text{GOV DEBT} + 73779.69
\]

**Table 5**

<table>
<thead>
<tr>
<th>Long-Term VECM Estimate Results [CONS]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>GOV_EXP (-1)</td>
</tr>
<tr>
<td>BUDGET_DEFICIT (-1)</td>
</tr>
<tr>
<td>TAX_INCOME (-1)</td>
</tr>
<tr>
<td>GOV_DEBT (-1)</td>
</tr>
</tbody>
</table>

*Source: Processed Eviews data*

Budget deficit and Government Debt negatively and significantly affect private consumption in the $\alpha = 5\%$ in the long term where if the budget deficit decreases by 1 billion rupiah, there will be an increase in private consumption of 1.2 billion rupiah. When the government implements a fiscal deficit in the form of a budget deficit, the government will do more spending and debt. Indicated by if the government increases debt by 1 million dollars, then private consumption will decrease by 0.5 billion rupiah. This budget deficit implementation policy is called expansionary fiscal policy. Expansionary fiscal policy can stimulate the economy through rising incomes and then increasing private consumption. It should be noted that the Budget Deficit data is a negative number, so the negative sign on the data shows an increased Budget Deficit. Therefore, although the Budget Deficit has a negative influence in the data on consumption, the macroeconomic impact is positive.

In the long run, the effect of Government Spending and Tax Revenue is negative but not significant to the variable dependents of Private Consumption. The 1-billion-rupiah tax cut that took effect in one period ago will make people increase their consumption by 100 million rupiah at this time.

**In the short term**

\[
\Delta \text{CONS}_t = -0.366020(-0.438002-1.28323-0.100103-0.591323+73779.7) +
\]

\[
\text{CONS}_{t-1} \quad \text{GOV EXP}_{t-1} \quad \text{BUDGET DEF}_{t-1} \quad \text{TAX INC}_{t-1} \quad \text{GOV DEBT}_{t-1} \quad 0.496635 \quad \Delta \text{CONS}_{t-1} \quad 0.104314 \quad \Delta \text{CONS}_{t-2} -
\]

\[
0.281004 + 0.075431 - 0.103772 + \Delta \text{GOV DEBT}_{t-1} \Delta \text{GOV DEBT}_{t-2}
\]
\[ \Delta BUDGET\_DEF_{t-1} 0.500023 \Delta BUDGET\_DEF_{t-2} - 0.106271 - 0.227935 - 0.134305 + 0.098540 + 36390.42 \Delta TAX\_INC_{t-1} \]
\[ \Delta TAX\_INC_{t-2} \Delta GOV\_DEBT_{t-1} \Delta GOV\_DEBT_{t-2} \]

**Table 6**
Short-Term VECM Estimate Results [CONS]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>T-statistic</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept C</td>
<td>36390.42</td>
<td>[3.22442]</td>
<td>Significant</td>
</tr>
<tr>
<td>CointEq1</td>
<td>-0.36602</td>
<td>[-3.26609]</td>
<td>Significant</td>
</tr>
<tr>
<td>D (CONS (-1))</td>
<td>0.496635</td>
<td>[2.96799]</td>
<td>Significant</td>
</tr>
<tr>
<td>D (CONS (-2))</td>
<td>-0.104314</td>
<td>[-0.44394]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (GOV_EXP (-1))</td>
<td>-0.281004</td>
<td>[-2.02849]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (GOV_EXP (-2))</td>
<td>0.075431</td>
<td>[0.46273]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (BUDGET_DEFICIT (-1))</td>
<td>-0.103772</td>
<td>[-0.38694]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (BUDGET_DEFICIT (-2))</td>
<td>-0.500023</td>
<td>[-2.24113]</td>
<td>Significant</td>
</tr>
<tr>
<td>D (TAX_INCOME (-1))</td>
<td>-0.106271</td>
<td>[-0.39589]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (TAX_INCOME (-2))</td>
<td>-0.227935</td>
<td>[-0.82184]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (GOV_DEBT (-1))</td>
<td>-0.134305</td>
<td>[-0.23282]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (GOV_DEBT (-2))</td>
<td>0.09854</td>
<td>[0.15864]</td>
<td>Insignificant</td>
</tr>
</tbody>
</table>

*Source: Processed Eviews data*

Based on Table 5, in a short-term analysis with a t-table of 5% of 2,032 states that Private Consumption is not significantly affected by other Variables except budget deficits in lag 2. In lag 1 Private Consumption was only influenced by itself the previous period. Ect (Error Correction Term) values show significant values. A significant coefficient indicates that there is a long-term causality relationship between variables and other variables to dependents in private consumption. An ECT value of 0.36602 indicates that Private Consumption took almost 3 years (1/0.36602) to return to equilibrium.

So that the interpretation of the model will be as follows, Private Consumption of the current period will be influenced by the previous period's Private Consumption and the Budget Deficit of the previous two periods. If the...
previous 2 periods (years) the budget deficit increases (increasing the deficit) by 1 billion rupiah, then consumption will increase by 500 million rupiah.

b. Vector Error Correction Model (VECM) Budget Deficit [BUDGET_DEFICIT]

In the long run

\[
\text{BUDGET_DEFICIT} = (-0.77928) \text{CONS} + 0.341326\text{GOV_EXP} + 0.078009\text{TAX_INCOME} + 0.460806\text{GOV_DEBT} + 57495.02
\]

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Coefficient</th>
<th>T-statistic</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONS (-1)</td>
<td>-0.77928</td>
<td>[-4.67436]</td>
<td>Significant</td>
</tr>
<tr>
<td>GOV_EXP (-1)</td>
<td>0.341326</td>
<td>[1.65531]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>TAX_INCOME (-1)</td>
<td>0.078009</td>
<td>[0.25332]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>GOV_DEBT (-1)</td>
<td>-0.460806</td>
<td>[-5.75622]</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Table 7
Long-Term VECM Estimate Results [BUDGET_DEF]

In testing using VECM, against variable budget deficit dependents, it can be seen that consumption and government debt have a significant effect in the long run. When government debt increases by 1 million dollars, the Budget Deficit will increase in deficit by 0.4 billion rupiah. It should be noted that the budget deficit data contains negative numbers, so the increase in data is interpreted as a surplus and the decrease in data is characterized by the greater the budget deficit (the more deficit). This relationship can be explained as follows, that when the government increases its debt both with foreign loans and bond issuance, it will result in a larger budget deficit. In addition, in the long run there is an effect of Private Consumption on negative budget deficits. If consumption increases by 1 billion, it will cause a deficit increase of 700 million rupiah. An increased budget deficit results in increased consumption, so aggregate demand also increases which then affects output and employment opportunities that increase. But the government needs to be careful because financing the budget deficit with government debt will negatively affect the economy. This is because the issuance of government bonds will be accompanied by an increase in interest rates which in part will crowd out private investment.

Variable government spending and tax revenues do not show a significant effect on the budget deficit even though the relationship is positive. This is because most of the data is the current state of the T-account state budget (1980-1999), where government spending and revenues are the same, the
existence of a budget deficit is only financed by government debt at that time. So, this leads to long-term regression results, both government spending and tax.

In the short term

\[
\Delta BUDGET\_DEFICIT_t = 0.309507(– 0.77929 – 0.34132 – 0.078008 – 0.460806 + 57495.017) \quad BUDGET\_DEF_t–1 \quad CONS_t–1 \quad GOV\_EXPT–1 \quad TAX\_INCT–1 \quad GOV\_DEBT_t–1 \quad 0.818850 \\
\Delta C BUDGET\_DEF_t–1 + 0.159509 \quad \Delta BUDGET\_DEF_t–2 + 0.529315 + \Delta CONS_t–1 \quad 0.090525 – 0.025034 + 0.273641 – \Delta CONS_t–2 \Delta GOV\_EXPT–1 \Delta GOV\_EXPT–2 \quad 0.604201 – 0.931989 \\
- \Delta TAX\_INCT–1 \quad \Delta TAX\_INCT–2 \quad 0.332886 – 0.818608 + 29997.31 \Delta GOV\_DEBT_t–1 \Delta GOV\_DEBT_t–2
\]

### Table 8

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>T-statistic</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept C</td>
<td>29997.3</td>
<td>[3.09834]</td>
<td>Significant</td>
</tr>
<tr>
<td>CointEq1</td>
<td>0.30951</td>
<td>[2.50883]</td>
<td>Significant</td>
</tr>
<tr>
<td>D (BUDGET_DEFICIT (-1))</td>
<td>-0.8189</td>
<td>[-3.55917]</td>
<td>Significant</td>
</tr>
<tr>
<td>D (BUDGET_DEFICIT (-2))</td>
<td>0.15951</td>
<td>[0.83339]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (CONS (-1))</td>
<td>0.52932</td>
<td>[3.68741]</td>
<td>Significant</td>
</tr>
<tr>
<td>D (CONS (-2))</td>
<td>0.09053</td>
<td>[0.44910]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (GOV_EXP (-1))</td>
<td>-0.1038</td>
<td>-0.025034</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (GOV_EXP (-2))</td>
<td>0.27364</td>
<td>[1.95679]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (TAX_INCOME (-1))</td>
<td>0.6042</td>
<td>[2.62378]</td>
<td>Significant</td>
</tr>
<tr>
<td>D (TAX_INCOME (-2))</td>
<td>0.932</td>
<td>[3.91714]</td>
<td>Significant</td>
</tr>
<tr>
<td>D (GOV_DEBT (-1))</td>
<td>-0.33289</td>
<td>[-0.67268]</td>
<td>Insignificant</td>
</tr>
<tr>
<td>D (GOV_DEBT (-2))</td>
<td>-0.81861</td>
<td>[-1.53628]</td>
<td>Insignificant</td>
</tr>
</tbody>
</table>
The table above shows short-term VECM results with Budget Deficit as a variable dependent. Ect (Error Correction Term) values show significant values. A significant coefficient indicates that there is a long-term causality relationship of other variables to the Budget Deficit variable. An ECT value of 0.30951 indicates that Private Consumption took 3 years (1/0.30951) to return to equilibrium.

In the short term, private consumption of the previous period, Tax Revenue in the previous two periods and the previous period and the variable budget deficit of the previous period affect the budget deficit in the current period. Private consumption has a positive influence on the budget deficit. When consumption rises by 1 billion rupiah, the budget deficit will decrease by 500 million rupiah. Then, tax revenues that increased by 1 billion rupiah in the short term negatively affected the Budget Deficit by 600 million rupiah in the previous period.

**Granger Causality Test**

Causality testing using Granger is intended to test the relationship between variables. The Granger causality test has the following hypothesis where H0 is an observed variable that has no causality, and the alternative hypothesis (H1) is the variable observed to have causality. H0 is rejected if the probability value < 0.05. The lag used in the Granger Causality Test is the same as *optimum lag 2* as it has been tested in previous *length lags*. The test results can be seen in Table 11 below:

<table>
<thead>
<tr>
<th>Null Hypothesis:</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
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<tr>
<td>GOV_EXP does not Granger Cause CONS</td>
<td>37</td>
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<tr>
<td>CONS does not Granger Cause GOV_EXP</td>
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<td>5.92128</td>
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<td>19.2566</td>
<td>3.0E-06</td>
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<td>CONS does not Granger Cause GOV_DEBT</td>
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<td>8.61852</td>
<td>0.0010</td>
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<td>1.05478</td>
<td>0.3601</td>
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<td>GOV_EXP doesn’t Granger Cause GOV_DEBT</td>
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<td>3.46230</td>
<td>0.0435</td>
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<td>0.1631</td>
<td></td>
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<tr>
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<td>0.0452</td>
<td>0.7414</td>
</tr>
<tr>
<td>BUDGET_DEFICIT doesn’t Granger Cause GOV_DEBT</td>
<td>37</td>
<td>0.30207</td>
<td>0.7414</td>
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<tr>
<td>GOV_DEBT doesn’t Granger Cause TAX_INCOME</td>
<td></td>
<td>0.62256</td>
<td>0.5429</td>
</tr>
<tr>
<td>TAX_INCOME doesn’t Granger Cause GOV_DEBT</td>
<td></td>
<td>4.15658</td>
<td>0.0248</td>
</tr>
</tbody>
</table>
Source: Eviews Data Processed Results

In such causality testing, it can be seen that the Private Consumption Variable [CONS] is only influenced by the Budget Deficit variable and the Budget Deficit variable is influenced by Private Consumption, so there is a bidirectional relationship. However, there was no significant effect of the other three variables on consumption. So that the relationship between Private Consumption Variables and Government Spending, Tax Revenue and Government Debt is one-way (unidirectional). Private Consumption variables themselves have an influence on all four other variables because consumption is the largest component of GDP (about 50-60%), and GDP affects all macroeconomic variables. So, this is what causes consumption to affect variables of Government Spending, Budget Deficit, Tax Revenue and Government Debt.

Then, the Budget Deficit Variable is controlled by all other Variables. This one-way relationship is indicated by variable government spending, tax revenue, and government debt to budget deficit. This shows that the existence of a Budget Deficit can be affected by Government Spending, Tax cuts and government debt.

Impulse Response Function

Impulse response analysis is intended to look at the responsiveness of dependent variables to other variables in the system when given a shock or change in the value of the error disorder variable. Variable responsiveness is measured by 1-standard deviation. To facilitate interpretation, the results of the IRF analysis are presented in graphic form that can be seen in the graph below. The horizontal axis on the graph shows the time or period of shock lasting up to 10 periods (years), while the vertical axis describes the magnitude of the shock responsiveness that lasts.

![Graph of Consumption Response to Government Spending Shock](image)

Source: Processed Eviews data

Figure 3

Graph of Consumption Response to Government Spending Shock

1. CONS response to GOV_EXP shock
At the beginning of the period, the provision of shock by government spending on private consumption had no effect (it was seen that the result was 0) and would then have a negative impact until the 2nd year, with a deviation of -4,962. This is because in the short term, government spending will not stimulate the economy through consumption. Starting in the third year, Private Consumption gave a positive response that increased until the 10th period since the shock or shock on the Government Spending variable. This is because the government spending component includes subsidies for consumer goods and services such as fuel, education and government transfers to certain groups which when increased can increase disposable income, resulting in a positive long-term response to consumption. The persisten impact is caused because there is a multiplier effect of government spending.

Response to Cholesky One S.D. Innovations

![Graph of Consumption Response to Budget Deficit Shock](image)

**Figure 4**

*Graph of Consumption Response to Budget Deficit Shock*

2. CONS response to BUDGET_DEFICIT shock

Like fiscal policy in general, shocks or changes in the value of the budget deficit at the beginning of the period have no effect on consumption, because fiscal policy takes a period of time until it finally has an impact. Then, the consumption response to the budget deficit also tends to increase positively in the initial period of shock delivery and begins to decrease in the period of the 3rd year to so on. This positive response can be explained because the implementation of fiscal policy in the form of budget deficit will increase consumption where budget deficit policy in the form of tax reduction and increased spending has a multiplier effect (doubling effect) on the income (economic economy) of a country (Ministry of Finance, 2018). The increase in government spending that leads to increased revenues, then increases consumption. Shock or change in the value of the budget deficit to consumption continues in the long term permanently.
3. CONS response to TAX_INCOME shock
   When there is a shock or shock from tax revenue, the consumption variable gives a negative response that continues to decrease until the 10th period. This negative response to the IRF can show that an increase in taxes will make people suppress their consumption and choose to save.

Source: Processed Eviews data

Figure 5
Graph of Consumption Response to Tax Revenue Shock

4. CONS response to GOV_DEBT shock

Source: Processed Eviews data

Figure 6
Graph of Consumption Response to Government Debt shock
Over the past 10 periods, it was seen that Private Consumption gave a fluctuating response but tended to be negative to shocks or 
shocks that occurred in Government Debt. At the beginning of the period there was a positive response of 3,674 in the 3rd period and began to decrease from the 4th to 10th period. This result is in accordance with the Keynesian preposition which says that in the short term, the budget deficit with debt will have a positive effect on the economy, but Keynesians are myopic people, so the long-term resulting from government debt is negative. This can be explained by the existence of Government Debt, in the short term will increase income which will then increase consumption, thus encouraging 
Money Demand to increase. Increasing MD in the long run will then push interest rates higher and eventually attract people's consumption into savings.

Test Forecast Variance Decomposition

Table 12
Estimated Results of Variance Decomposition Consumption

<p>| Variance Decomposition of CONS: |</p>
<table>
<thead>
<tr>
<th>S.E.</th>
<th>CONS</th>
<th>GOV_EXP</th>
<th>BUDGET_DEFICIT</th>
<th>TAX_INC</th>
<th>GOV_DEBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22622.78</td>
<td>100.0000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>2</td>
<td>32942.26</td>
<td>91.39305</td>
<td>3.804074</td>
<td>4.751627</td>
<td>0.020856</td>
</tr>
<tr>
<td>3</td>
<td>43310.40</td>
<td>58.35818</td>
<td>2.276552</td>
<td>38.78409</td>
<td>0.258752</td>
</tr>
<tr>
<td>4</td>
<td>52000.53</td>
<td>41.97903</td>
<td>2.104574</td>
<td>54.15447</td>
<td>1.438614</td>
</tr>
<tr>
<td>5</td>
<td>61548.63</td>
<td>30.67277</td>
<td>4.007734</td>
<td>61.43369</td>
<td>3.249658</td>
</tr>
<tr>
<td>6</td>
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<td>25.21004</td>
<td>6.612115</td>
<td>63.79041</td>
<td>3.397550</td>
</tr>
<tr>
<td>7</td>
<td>75983.53</td>
<td>20.38326</td>
<td>10.48735</td>
<td>64.22696</td>
<td>3.911570</td>
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<tr>
<td>8</td>
<td>84325.98</td>
<td>17.25856</td>
<td>15.35219</td>
<td>61.45396</td>
<td>4.641603</td>
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<td>9</td>
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<td>18.89400</td>
<td>59.59405</td>
<td>4.678890</td>
</tr>
<tr>
<td>10</td>
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<td>13.18897</td>
<td>22.20094</td>
<td>58.40245</td>
<td>4.711494</td>
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</tbody>
</table>

Source: Processed Eviews data

Based on the FEVDs Table 12, the Indonesian Economy is notated with Private Consumption, in the next 12 months, its decomposition is influenced and offset by the movement of private consumption variables themselves. In the following 12 months, the decomposition of changes in the budget deficit [BUDGET_DEFICIT] became even greater against Private Consumption. We can also see changes in Government Spending [GOV_EXP] on Private Consumption increasing in the future, although the impact on Consumption is smaller than the Variable Budget Deficit. In the long term (period 10), the Variable Budget Deficit and followed by the Government Spending Variable have the most influence on Private Consumption compared to itself.
Table 13
Estimated Results of Variance Decomposition of Budget Deficit

<table>
<thead>
<tr>
<th>Period</th>
<th>S.E.</th>
<th>CONS</th>
<th>GOV_EX</th>
<th>BUDGET_DEFICIT</th>
<th>TAX_IN</th>
<th>GOV_DEBT</th>
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<tbody>
<tr>
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<td>1.058436</td>
<td>95.46418</td>
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<td>4.83389</td>
<td>5.794564</td>
<td>84.52847</td>
<td>4.531389</td>
<td>0.311675</td>
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<tr>
<td>3</td>
<td>39150.4</td>
<td>4.81825</td>
<td>2.150424</td>
<td>84.26791</td>
<td>4.878693</td>
<td>3.884718</td>
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<tr>
<td>4</td>
<td>45285.9</td>
<td>10.8359</td>
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<tr>
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<tr>
<td>6</td>
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<td>10.8096</td>
<td>1.421711</td>
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<td>6.704946</td>
<td>7.147575</td>
</tr>
<tr>
<td>7</td>
<td>60181.8</td>
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<td>3.377202</td>
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<td>11.4658</td>
<td>4.728269</td>
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<td>6.550040</td>
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<td>68531.6</td>
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<td>9.102086</td>
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<td>6.018152</td>
<td>8.707723</td>
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</tbody>
</table>

Source: Processed Eviews data

It is seen that the decrease in the composition of the Budget Deficit with itself is followed by the increase in the influence of Private Consumption and Other Variables in the long term. The decomposition of private consumption in the Budget Deficit was also shown in the VECM test of significant consumption to the Budget Deficit. This shows that the effect of the persistent Budget Deficit on itself and other variables.

Discussion
VECM results show long-term and short-term results from the data, where in the long term it can be concluded that the concept of Ricardian Equivalence view cannot be applied in Indonesia. This can be seen based on Indonesia's private consumption variables that are negatively related to the budget deficit in the long term, which means that if the government budget is made more deficit, private consumption will increase. This clearly breaks the Ricardian Equivalence view. In addition, it can be conveyed that the Budget Deficit affects public consumption through its financing with Debt, such as the results on Granger causality testing and VECM with Budget Deficit as variable dependents. In accordance with the results of the test, the implementation of the fiscal deficit using the budget deficit will have more effect than
tax cuts for the Indonesian economy. This is because unlike the United States, Indonesia has never conducted a fiscal deficit policy with tax cuts, therefore changes in tax revenues do not have a significant influence on consumption.

In addition, it can be seen how Government Debt has a significant negative effect on consumption, which again breaks the general principle of Ricardian Equivalence which says that the implementation of debt-funded fiscal deficits does not affect consumption, according to Adji’s (2016) study. According to Berben (2005), in a country that implements a budget deficit that relies heavily on government debt, debt will have a negative influence on consumption. Because in a position of high government debt, people tend to think about the condition of sustainability of debt stability, and this is what makes people turn their consumption decisions into savings (crowding out). So, in implementing fiscal deficit policy in the form of budget deficit with debt, the government must be wiser and careful.

Based on the explanations and results that have been described above, the view on budget deficit policy that applies in Indonesia is a Keynesian view. Keynesian views argue that fiscal deficit policies in the form of budget deficits or tax cuts can have an impact on the economy through increased private consumption (Mankiw, 1992). In addition, taxes that have a negative although insignificant relationship to the variable dependents of Private Consumption also explained that with tax cuts, people's disposable income will increase, so consumption will also increase. And higher private consumption spending, in the short term, will drive aggregate demand for goods and services. Thus, output and employment opportunities also increase. As explained in chapter 2, the positive impact of the budget deficit on the economy through private consumption can be explained because the Indonesian economy is not in a state of full employment. Where public consumption will increase aggregate demand, which will then increase the supply side through production and national income (Maryatmo, 2005).

In short-term VECM estimates it is seen that Private Consumption is not significantly affected by variables except budget deficits at lag 2. Private Consumption of the present period will be affected by the previous period's Private Consumption and the Budget Deficit of the previous two periods. If the previous 2 periods (years) of budget deficit experienced an increasingly large deficit of 1 billion rupiah, then consumption will increase by 500 million rupiah. This suggests that in the short term, fiscal deficit policy will not yet impact the economy through private consumption. Budget deficits and the impact of government debt on consumption have also not been well transmitted.

In VECM estimates, dummy variables are used to see how much changes are generated in times of crisis that will then impact the economy. In the above estimates, dummy variables do not show significant results, which explains that from 1998 to 1999, during the financial crisis in Asia, people's consumption did not change significantly. This is because people tend not to consume due to high inflation. Therefore, in that year the economy experienced a slowdown and sluggish because
most consumers do not want to consume. Second, the reason why the dummy value of the variable is then insignificant is because the impact of the crisis is more directly transmitted on investment decisions. However, when dummy variables are viewed with dummy estimates of parameters with variable budget deficits, regression results show that during a crisis, the existence of a budget deficit affects private consumption.

Then, impulse response function (IRF) testing shows the suitability of the relationships between variables described in Chapter 2 where the shock in government spending is responded positively by private consumption because government spending components such as subsidies, and transfers can increase disposable income that can be consumed. The second is shown that consumption responds positively to the shock of the budget deficit. And it will peak in the 2nd period and start to fall in the 3rd period. In addition, the response of consumption to taxes is also negative, this indicates the Keynesian view that applies in Indonesia, where the fiscal deficit policy in the form of public tax cuts will increase consumption, although the results do not show a significant influence.

CONCLUSIONS AND SUGGESTIONS

Conclusion
In this study, the authors conducted research on the effect of fiscal deficits in the form of budget deficits on the Indonesian economy with private consumption proxies from 1980 to 2018. This influence then determines the view of what budget deficit applies in Indonesia, which can then be used as fiscal policy decision-making. The 5 (five) macro variables used in the study are Private Consumption, Government Spending, Budget Deficit, Tax Revenue and Government Debt. The analysis is done with the VECM method (Vector Error Correction Model) which is then viewed gradually that is, first the VECM estimate is done to look at long-term and short-term relationships. It also includes a causality test using the Granger Causality Test. Second, the authors looked to the IRF (Impulse Response Function) to see the dependent response of consumption variables to the shock of other variables in the model. Third, it is also looked at the Forecast Error Decomposition of Variance to see which variables contribute the most to consumption. The authors also conducted VECM estimates using Budget Deficit as a variable dependent to determine which variables had the most effect on budget deficit changes.

The results show that keynesian views apply in Indonesia. VECM estimates show the effect and long-term relationship of Budget Deficit and Government Debt to Private Consumption. This significant influence breaks the Ricardian hypothesis, which argues that government fiscal policy, particularly budget deficits, has no effect on the economy or neutrality preposition. A budget deficit that positively affects indicates that fiscal deficit policy can stimulate the economy and can be used to overcome recession conditions. The significant and positive relationship between budget deficits through government debt (shown in granger causality testing) is significant and
positive for private consumption further strengthens that Keynesian view in Indonesia. This conclusion is reinforced by the results of IRF (Impulse Response Function) testing also shows that the shock at the budget deficit will be responded positively by private consumption with permanent impacts.

In the short term, private consumption is only influenced by the past period and other macroeconomic variables are insignificant to private consumption (described in the Forecast Error Decomposition of Variance). This indicates that the influence of macroeconomic fiscal policy on developments in the real sector through a mechanism that generally does not have an immediate impact, usually requires a certain grace period.

**Recommendation**

In further research, more macro-economic variables are expected to be used to determine fiscal policy in the form of budget deficits, such as through their effect on interest rates (investment) or the influence on current accounts. Adding macroeconomic variables as variable dependents will give us a clearer picture and transmission of policies so that more policies can be constructed based on research results.

The condition of the Covid 19 pandemic that caused Indonesia's economic sluggishness, even in the 2nd and 3rd quarter of 2020 experienced negative growth or there has been a recession. Increasing the budget deficit that exceeds 3% to deal with pandemics and economic recovery is the right decision, because based on the findings of this study will have an impact. consumption, even if it takes time. For that it needs to be continued with forward-looking debt management.

Recommendation for fiscal policy makers, although the implementation of fiscal deficits in the form of budget deficits has a positive effect on the economy, it should be noted that the government still uses alternative financing with debt in the implementation of budget deficits. In the long run, debt can negatively affect the economy because the government not only has to pay back its debt, but also accompanied by interest installments of debt to be paid. So there needs to be specific policies and strategies to maintain the health and composition of Indonesian government debt. The government can conduct a mix of fiscal policy and monetary policy, where financing the budget deficit with the issuance of state bonds can be balanced with bi interest rate adjustments. So that government debt does not crowd out private investment in the long run.

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Ricardian Equivalence In Indonesia


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