Dynamic Causal Relationship between Government Expenditures and Revenues in Indonesia

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Abstract—This paper examines the causal relationship between government expenditure and revenues in Indonesia during the period 1963 to 2017 by using the Vector Auto Regression (VAR) model. The results show that there is a strong relation and it represents a bi-directional causality between expenditure and revenue. However, government expenditure and revenue relationship is negative and revenue is positively related to government expenditure. This supports Wagner's law related to fiscal policy in Indonesia from revenue to expenditure. The finding also shows that the longer expenditure does not have an impact on increasing revenue and it stimulates a greater gap in the fiscal deficit in Indonesia. In order to cover the fiscal deficit, Indonesian government policy really relies on loans.

Keywords—Dynamic Causality, Government Expenditure; Revenues; Fiscal Policy; Vector autoregression

I. INTRODUCTION

The purpose of fiscal policy strategy of developed and developing countries around the world is to minimize government deficits which are directed towards avoiding the risk of economic collapse. Many concepts related to fiscal policy are implemented by a country to increase economic growth. One of which is the concept of fiscal discipline consisting of achieving and maintaining fiscal discipline (Edirisinghe & Sivarajasingham, 2015), understanding correctly about budget movements and causal relationships between government revenue and government spending. Indonesia has experienced this for decades without change; each budget preparation always results in a budget deficit. In 1999 Indonesia experienced a monetary and economic crisis, as well as political upheaval that arose after the centralistic and authoritarian retreat of Soeharto regime in many of Indonesia’s policies changed drastically. The government has been trying to improve the economy so that it can grow in a better direction.

Fiscal policy is very helpful for the government which covers two things namely government expenditure and income, fiscal policy is seen as an important instrument in achieving sustainable economic growth (Mahdavi & Westerlund, 2011). Furthermore, in an economy, according to Wagner (1883) government revenue caused public expenditure, but according to Keynes (1936) public expenditure led to the income of the Keynesian government. Using two Wagner and Keynes approaches, Srinivasan (2013) measures public expenditure. Wagner's law was formulated based on observations from historical evidence in several industrial countries. There is a long-term trend of government spending that increases income per capita. Moreover, in Keynesian theory, government spending is considered as a fiscal policy instrument used to achieve short-term stability and a higher level of growth in the long run. Government intervention on the economy through fiscal policy plays an important role in the development process. The economic downturn can be changed by the government through loans from the private sector which is then returned to the private sector with various government expenditure programs. The Keynesian approach shows that public expenditure is an exogenous factor and a policy instrument to increase national income, so that the causal relationship between public expenditure and national income runs from expenditure to income (Mupimpila, et. al, 2015; Petanlar & Sadeghi, 2012; Al-Zeaud, 2015). Determining direction of mutual dependence (Petanlar & Sadeghi, 2012) between variables helps policymakers know how much imbalance there may be and facilitates efforts to develop strategies that are suitable for fiscal reform in the future.

So far, Indonesia implements the budget deficit system, namely the government budget followed by the government revenue. This system creates an uncontrollable situation for the government spending and revenue because the spending becomes larger than revenue received by the government. This will stimulates an increasing additional loan in the next period. Ullah (2016) argued that the government will spend the money first and then will raise funds to cover the cost of the previous expenditure. Without the right rules and regulations, this relationship will continue to cause the budget deficit, higher
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government spending will result in higher government revenues, so the government must borrow money from both domestic and foreign sources to cover their budget deficits, while borrowing money will continuously not complete a budget deficit (Ullah, 2016). Keynesian policy, states that the budget deficit in the long run can provide positive results if the realization of the intended economic output is below the potential (Lojanica, 2015). When the economy shows signs of recession (economic growth is falling) for example, the ideal choice of fiscal policy is to increase state spending and / or reduce tax revenues, so that the budget deficit increases. Conversely, when the economy shows strengthening (economic growth rises), the government seeks to increase tax revenues and/or reduce state spending, so that the budget deficit decreases (Nizar, 2011). Fiscal deficits can be overcome either from a shopping or income angle or both. In other words, spending can be reduced or income increased or both can be done simultaneously (Obeng, 2015), so spending will positively encourage income which in turn affects the Keynesian hypothesis (54)

The government fulfills taxation and expenditure policies to redistribute its income and wealth for the betterment of society (Mohanty & Mishra, 2017; Payne, 2003), but it is not always easy to evaluate where government spending is effectively spent (Holcombe, 2006), due to increased government spending, without increasing their respective income, it would expand the budget deficit (Dritsaki, 2018). According to Adolph Wagner, a German economist in his theory of Law of rising public expenditures, that to anticipate a trend that will be realized fifty to one hundred years later, a continuous expansion of the public sector in the economy is needed. Increased public goods expenditures are caused by a large increase in productivity in society; this can be seen by rising per capita income. With the law increasing public expenditure is expected to increase the economy accompanied by increased spending (Musgrave, 1989). In this paper, we explore the effects of fiscal policy on determining government spending and revenues from the theories of Wagner and Keynes.

II. METHOD

This study investigates the dynamic causality in relation to the government spending and revenue in Indonesia and uses secondary data, namely government revenue and expenditures data during the period 1963 to 2017 (54 years). The data are obtained from the Ministry of Finance of the Republic of Indonesia (Kemenkeu, 2018) and Indonesian Central Bureau of Statistics (CBS of Indonesia). A VAR model is used to investigate the purpose of this study by using 2 variables and 1 lag. The structural relationship of variables is determined in both ways. The equations are represented as follows:

\[
\text{EXP}_t = \alpha_1 + \beta_1 \Sigma \text{EXP}_{i,t} + \beta_2 \Sigma \text{REV}_{i,t} + \varepsilon_{1t}
\]

(1)

\[
\text{REV}_t = \alpha_2 + \beta_2 \Sigma \text{REV}_{i,t} + \beta_1 \Sigma \text{EXP}_{i,t} + \varepsilon_{2t}
\]

(2)

where EXP, and REV refer to real government expenditure and government revenue, respectively. \(\alpha_1\) and \(\alpha_2\) are the coefficients of government revenue and government expenditure, respectively. \(\varepsilon_{1t}\) and \(\varepsilon_{2t}\) are the error terms.

The next test, this study uses Granger Causality (1969) because of a stronger but simpler way to test causal relationships (Birhanu, 2016). Using linear equations and time series data of government expenditure variables (EXP) and government revenue (REV), the Granger causality test is formulated in two forms of regression models:

\[
\text{EXP} = \sum_{t=1}^{n} \alpha \text{EXP}_{i,t} + \sum_{t=1}^{n} \beta \text{REV}_{i,t} + \varepsilon_{1t}
\]

(3)

\[
\text{REV} = \sum_{t=1}^{n} \lambda \text{REV}_{i,t} + \sum_{t=1}^{n} \delta \text{EXP}_{i,t} + \varepsilon_{2t}
\]

(4)

where \(\varepsilon_{1t}\) and \(\varepsilon_{2t}\) are assumed that the error terms are uncorrelated and this study uses Granger testing \(\alpha = \beta = \lambda = \delta\). The regression results of the two forms of this equation will produce four possibilities conditions regarding each regression coefficient as follows:

1. If \(\sum_{t=1}^{n} \beta \neq 0\) and \(\sum_{t=1}^{n} \delta = 0\), then there is one-way causality from REV to EXP (unidirectional causality).
2. If \(\sum_{t=1}^{n} \beta = 0\) and \(\sum_{t=1}^{n} \delta \neq 0\), then there is a one-way causality from EXP to REV (unidirectional causality).
3. If \(\sum_{t=1}^{n} \beta = 0\) and \(\sum_{t=1}^{n} \delta = 0\), then EXP and REV are free from one to the other (bilateral causality).
4. If \(\sum_{t=1}^{n} \beta \neq 0\) and \(\sum_{t=1}^{n} \delta \neq 0\), then there is a two-way causality between EXP and REV (independence).
III. FINDING AND DISCUSSION

The Granger test of this study in Table I shows that the directional causality of expenditure and revenue during the period 1963-2017. There is a bi-directional causality between government expenditure and revenue in Indonesia. This result is supported by some previous studies such as Al-Zeaud, (2015) in Jordan with the long term analysis and Kamasa & Abebrese, (2015) as well as Takumah (2014) in Ghana with the short and long term analysis.

<table>
<thead>
<tr>
<th>No.</th>
<th>Revenue does not Granger Cause expenditure</th>
<th>F-Statistic</th>
<th>Lags</th>
<th>Probability</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>170.554</td>
<td>2</td>
<td>3.E-06</td>
<td>Bi-directional</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>170.554</td>
<td>2</td>
<td>7.E-08</td>
<td>Bi-directional</td>
<td></td>
</tr>
</tbody>
</table>

Furthermore, to test the stationarity of the observed variables, this study uses ADF test measured based on ADF statistics and critical values on significant level by 1% and 5%. ADF test results in Table II shows ADF statistical values for expenditure and revenue variables which represent that each value of two variables’ stationary test is less than the critical value. This means that both variables are stationary at at-level.

The study was continued with a Granger causality test. Granger’s causal test is very sensitive to the selection of lag and it is determined by Akaike Information Criteria (AIC). As shown in Table III, government expenditure has Granger causality and effect relationship on government revenue with smaller p-value for each variable than significant level by 1%. The results represented in Table III show that there is a bi-directional causality between government revenue and government expenditure.

The impact of the standard deviation shock of government expenditure and revenue on government revenue can be presented in Figure I. Horizontal line describes the years of the study and vertical line illustrates the impact of government expenditure on government revenue. This represents that the government expenditure has a positive short-run impact on the government revenue in five years in first period. But, in the second period, this relationship has a negative impact because the formulation of the Indonesian budget starts from the budget deficit so that the revenue received by the state is insufficient to finance expenditure in the fiscal year. This forces the government to owe from the other countries to cover financing fiscal deficit in subsequent years and periods. The government must be careful in efforts to reduce the budget deficit. The decline can be done by increasing revenue (Wolde & Rufael, 2008), cutting expenditure, or changing both without considering the interdependence between the two variables; this could result in no results in fixing the budget deficit.
Figure I also shows that the government revenue has a positive relationship on Indonesian government expenditure, both in the short and long term. Therefore, we can say that the results support for the Wagner hypothesis for Indonesian case over the period of 1963-2017. Likewise, what were discovered by Magazzino et al. (2015); Hasnul (2016); Rosoiu (2015); Petanlar & Sadeghi (2012), their results also support Wagner's law. This indicates that the longer expenditure does not have an impact on increasing revenue and it will create a greater gap in the fiscal deficit of government. The Indonesian government's policy of imposing new expenditure on revenue in the preparation of the budget resulted in a continuous deficit of loans made to cover the excess expenditure. Financing deterioration must be prevented by using better and not excessive expenditure, prioritizing spending that can increase revenue. This requires the support of all parties so that Indonesia can become a country that no longer relies on debt as it’s financing but has its own revenue to finance it.

IV. CONCLUSION

Information about government spending and revenue is needed especially for fiscal policy makers because there is important information for policy makers. Especially for countries which often experience deficit in their budget, Indonesia is no exception. This study investigates the dynamic causality of relationship between Indonesian government expenditure and revenue based on the theories of Wagner and Keynes in the period 1963-2017 using the Granger Causality Test approach in the VAR framework. The results show that there is a negative relationship between government revenue and expenditure and a positive relationship between government revenue and expenditure. This finding supports Wagner's law related to this case in Indonesia regarding revenue to expenditure. Because of the larger government expenditure than government revenue, Indonesia receives an impact on continuous deficit. Financing deterioration must be prevented by using better and not excessive expenditure, prioritizing expenditure which enables to increase revenue. This requires a stronger support from all parties so that Indonesia can become a country with no longer relying on debt as it’s financing because Indonesia has its own revenue to finance it.

REFERENCES

