



Long-run Relationship between Government Debt and Growth the Case of Indonesia

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ABSTRACT

This study examines long-run relationship between the government debt and economic growth in Indonesia. This study uses the autoregressive distributed lag cointegration method. Employing a time series data from 1980 to 2017, this study reveals that there is a negative long-run relationship between the ratio of government debt to gross domestic product (GDP) and the economic growth. That means the growth of debt ratio to the GDP could lower the growth in a long term.

Keywords: Economic Growth, Government Debt, Indonesia

JEL Classifications: C22, H63

1. INTRODUCTION

Economic development is a prerequisite for many developing nations to be able to catch up with developed countries. However, the efforts in building the economy are constrained by limited productive economic resources, especially capital resources. An alternative policy to meet the need of capital resource is the debt, both domestic and foreign debt.

There have been many studies discussed the benefit and impact of the debt to the economy of the developing countries such as done by Schlarek (2004), Aizenman et al. (2007), Kumar and Woo (2010), Reinhart and Rogoff (2010), Bal and Rath (2014), Spilotti and Vamvoukas (2015), Jacobo and Jalile (2017), Kharusi and Ada (2018) etc. Moreover, there has been a debate about the reliance on debt among economists and society. The increased government debt raises new anxiety related to the future impact of the debt.

Indonesia is a country that quite rely on the debt to boost the growth. Indonesia's debt has started to be significant since 1980's and the nominal amount continues to increase until now. In 1980,

total government debt is only Rp. 7.0 trillion. The total government has been increasing until in the end of 2018 has reached Rp. 4395.9 trillion. Based on data from the Ministry of Finance, Indonesia experienced the highest ratio of government debt to gross domestic product (GDP) in 2000, which was 97.1%. Then, the debt has gradually fallen into 25% GDP in 2014. Recently, the debt ratio has increased again and sparked public anxiety.

There was a lack of paper discussed the Indonesia's debt long-run relationship with the growth. Therefore, this study is purposed to examine the relationship between government debt and Indonesia's economic growth. It is expected to contribute to the research gap well as a reference for the government fiscal policies.

2. THEORETICAL FRAMEWORK

There are several views that state the relationship between debt and economic growth, including classic/neo-classical, Keynesian and Ricardian views. According to Barsky et al. (1986), classical/neo-classical economist argues that increasing debt to finance government spending will only affect the economic growth in

a short term, while in the long term it has no significant impact because of crowding-out effect. That is because of overheating in the economy which resulted in a decline in private investment. The government budget deficit financed by debt will cause an increase in individual consumption, while in a long-term, the debt burden will cause a tax increase for the next generation. An increase in individual consumption will reduce savings rates and cause an increase in interest rates. Increasing interest rates will then decline the private investment. In conclusion, neo-classical economists conclude that resolving government deficits with foreign debt will cause private investment to be evicted.

Meanwhile, Keynesian states that foreign debt in the short term will benefit the economy. According to the Keynesian, the state budget financed by foreign debt will have a significant effect on economic growth, because it will increase income and welfare so that consumption will increase (Eisner, 1989). The increased consumption will, in turn, raise national income. Unlike the previous view, The Ricardian equivalence theory said, the government cannot stimulate economic growth through debt-financed expenditures because this will not change demand (Mankiw, 2009). This is due to the fact that the smart public will know that in the future taxes will be greater due to the burden of government debt in the future. So, the public prefers to save the excess money than spend their money in consumption.

Empirical findings from various research have shown different results. Some research come up with positive relations between debt and growth, while others appears with an inverse relationship. Schclarek (2004) who conducted a research using the data of 59 developing countries found that there was a significant inverse relationship between foreign debt and economic growth. Similar results were also shown by the study Kumar and Woo (2010) which suggest an inverse relationship between initial debt and subsequent economic growth. The increasing the ratio of debt to GDP around 10% is associated with a slowdown in annual real per capita of GDP around 0.2 per year. Aizenman et al. (2007) tried to examine the relationship between government debt and economic growth by evaluating optimal public investment and fiscal policies for countries characterized by limited tax and debt capacities. The results of the study suggest that public debt has a negative effect on economic growth.

Moreover, Bal and Rath (2014) examines the effect of public debt on economic growth in India between 1980 and 2011. This study uses the autoregressive distributed lag (ARDL) model to find out long-run equilibrium relationships between public debt and economic growth. The error correction model (ECM) results show that central government debt, total factor productivity growth, and debt-services has negative impact the economic growth in the long-run. Recent research by Kharusi and Ada (2018) found that external debt has a negative impact and a significant economic growth and external debt in Oman 1990-2015. Using ARDL model, his research found that external debt has a negative relationship in the long run with economic growth. This is not much different from the short run, using the ECM method the results obtained are also negative between external debt and economic growth.

However, there are many empirical studies found the positive relationship between debt and economic growth. Reinhart and Rogoff (2010) has tested to 44 countries over 200 years. The study finds that the relationship between public debt and growth can be represented by an inverted U-shaped pattern, high debts which could lead to low economic growth and low debt instead of making economic growth became better. This study also suggests that if the debt below 90% of GDP have weak relationship with economic growth, but if the debt ratio has crossing the threshold level it will decrease the growth substantially.

Spilotti and Vamvoukas (2015) analyze the impact of government debt on GDP growth in Greece using the data for about 40 years starting in 1970. Empirical results find a positive relationship between government debt and economic growth in Greece at a certain level of debt ratio. Jacobo and Jalile (2017) investigates the impact of government debt on GDP in 16 Latin American economies over a period of about 50 years (1960-2015). In short-run, government debt has a positive effect on economic growth when the ratio of debt to GDP still below the threshold (64 and 71%). Meanwhile, if the debt has passed the threshold, it will negatively affect economic growth.

3. DATA AND METHOD

This research uses secondary time series data during the period 1980-2017. The sources of data are Bank Indonesia, Indonesia Ministry of Finance and the World Bank. The method of analysis used in this study is the ARDL cointegration approach. ARDL is a regression model that includes a variable value that explains the present value or the lag value of the dependent variable as one of the explanatory variables (Gujarati, 2009). This method can distinguish short and long-term responses from dependent variables to one unit of change in the value of explanatory variables. ARDL is a method that can be used even though there is a mixture between stationary and non-stationary in the variable used.

Although, the focus of this study is to estimate long-run dynamic relationships between government debt and economic growth, other independent variables (population, financial and human capital [HC], trade and inflation) which also affect the growth are included in the model. The model used in this study was adopted from the study by Kharusi and Ada (2018). The following model is used in this research:

$$\text{Ln GDPGR}_t = \beta_0 + \beta_1 \text{Ln DEBT/GDP}_t + \beta_2 \text{Ln POPGR}_t + \beta_3 \text{Ln GFCF}_t + \beta_4 \text{Ln TRD/GDP}_t + \beta_5 \text{Ln INF}_t + \beta_6 \text{Ln HC}_t + \mu_t$$

Where:

GDPGR: GDP growth rate

DEBT/GDP: Ratio of government debt to GDP

POPGR: Population growth rate (proxy for labor)

GFCF: Gross fixed capital formation (proxy for capital)

TRD/GDP: Ratio of trade to GDP

INF: Inflation

HC: HC proxied by primary school enrolment

β_0 : Intercept

β_1, \dots, β_6 are coefficients; U is the error term; and t represents time.

It uses the unit root test to investigate the stationary data. The method used is the augmented Dickey-Fuller (ADF) test. This improves higher order serial correlation by adding the time difference on the right side. In order to determine the optimum lag length of the variable, it employs the Schwarz Bayesian criterion as emphasized by Pesaran et al. (2001). This study also uses the bound testing cointegration, as introduced by Pesaran et al. (2001). The classical assumption test is conducted to ensure a best linear and unbiased estimation.

4. FINDINGS AND DISCUSSION

4.1. Brief Description of Indonesia's Economic Growth and Government Debt During 1980-2017

The Indonesia economy is now still classified as a middle-income economy, moving gradually from a low income, with a relatively stable growth in particular period. There was a period of stable and high growth during 1980-1996. Then there was a recession period during 1997-2000, with a sharp decline (-13.2%) in 1998. Nevertheless, the growth was relative stable in the period 2002-2017 but a bit lower than the growth before Asian financial crisis. Indonesia's economy was inseparable from the world economic conditions. It was affected by external shocks as happened in 1982, 1997 and 2008 (Figure 1).

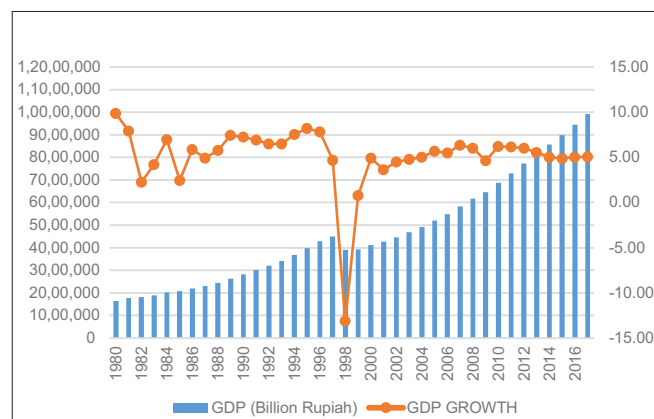
During the New Order Era (1966-1997) under President Soeharto, Indonesia's economy grew rapidly as a result of consistent development policies and supported by many international institutions and donor's countries. Over all, the average growth was about 6.5% but varied from 3% to 9%. The highest growth in such era was in 1980 (9%) and 1994 (7.5%). In 1997, the Indonesian economy began to decline following the Asian financial crisis. Then it down to a lowest contraction of the economy (-13.2%) in 1998. The crisis was mainly due to the debt of private sector (World Bank, 1998). Until the fourth quarter of 1998 the Indonesia's economy began to recover, and in 1999 the growth improved to 0.8%.

Generally, after the 1998 reforms, the Indonesian economy improved gradually. In the period 2000-2006 the growth return to normal and more balanced. The economy grew by 4.8% in 2000 and continued achieve a stable growth until 2018, with a bit dropped to 4.6% in 2009 due to the effect of global crisis.

Indonesia is a country that is not free from debt. The debt has started to play an important role in developing Indonesia's economy in 1980s. The nominal of government debt and the ratio of government debt to GDP in Indonesia during period 1980-2017 can be seen in Figure 2.

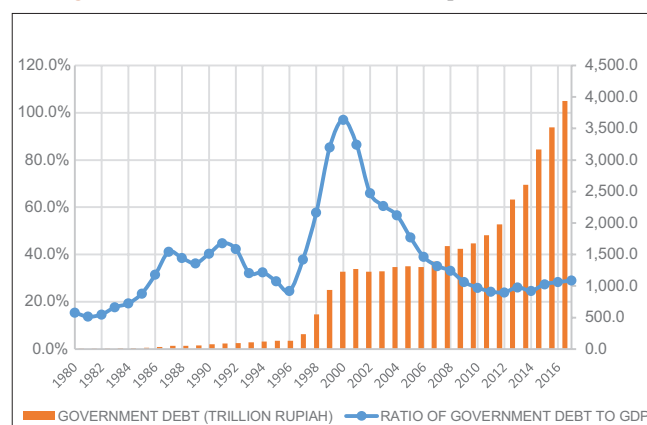
Figure 2 shows that the government debt is increasing every year, but the debt ratio was fluctuated. In 1980 the government debt was accounted at Rp. 7 trillion with the ratio to GDP was 15.4% of GDP. During the New Order Era, the debt increased gradually and reached Rp. 130.9 trillion in 1996. The increasing government debt in the era of Soeharto was to support a long-term development program. Nevertheless, the debt ratio in average was able to be maintained below 40% GDP. In the period 1994-1996 the ratio of Indonesian government debt tended to decline and reached the lowest 24.6%.

Figure 1: Growth rate of gross domestic product in Indonesia period 1980-2017



Source: World Bank (2018)

Figure 2: Government debt in Indonesia period 1980-2017



Source: Ministry of Finance (2018)

In 1998, the Asian monetary crisis that hit Southeast and East Asia had a big impact on the Indonesia's government debt since it was dominated by foreign currency. The debt became double due to the depreciation of rupiah. The ratio of government to GDP reached 57.8%. The effect of crisis and currency depreciation continued, the debt again increased dramatically to Rp. 939.5 trillion and ratio of debt to GDP reached 85.4% in 1999 and 97% in 2000.

Indonesia, then, has conducted a fiscal consolidation program since 2001. The debt in nominal term continued to increase, but the ratio to GDP gradually declined. In the era of president SBY, in 2009, government debt reached Rp. 1590.4 trillion, nevertheless, the ratio of debt to GDP declined to 28.4% in 2009. Then, at the end of president SBY's second term, the debt ratio down to the lowest level at 24.7% in 2014. In the era of president Jokowi (2014-2019), the ratio of government debt ratio started to rises. The ratio was 29.0% in 2017.

4.2. The Relationship between Growth and Government Debt in Indonesia

The ARDL cointegration approach which is used to analyze the long-run relationship between the growth and the debt started by conducting a stationary test. The ADF test statistics used to determine the order of integration for each variable.

Table 1: ADF test results at level

Variables	ADF test statistics	Prob.	MacKinnon critical values			Explanation
			1%	5%	10%	
GDPGR	-4.5906	0.0007	-3.6210	-2.9434	-2.6103	Stationary
DEBT/GDP	-2.0455	0.2670	-3.6329	-2.9484	-2.6129	Not stationary
POPGR	-3.6382	0.0099	-3.6329	-2.9484	-2.6129	Stationary
GFCF	-0.5414	0.8709	-3.6329	-2.9484	-2.6129	Not stationary
TRD/GDP	-3.1167	0.0339	-3.6210	-2.9434	-2.6103	Stationary
INF	-6.2534	0.0000	-3.6210	-2.9434	-2.6103	Stationary
HC	-2.7870	0.0702	-3.6268	-2.9458	-2.6115	Not stationary

ADF: Augmented Dickey-Fuller

Table 2: ADF test results at first different

Variables	ADF test statistics	Prob.	MacKinnon critical values			Explanation
			1%	5%	10%	
GDPGR	-6.5951	0.0000	-3.6329	2.9484	-2.6129	Stationary
DEBT/GDP	-4.1175	0.0028	-3.6329	-2.9484	-2.6129	Stationary
POPGR	-5.5407	0.0013	-3.6394	-2.9511	-2.6143	Stationary
GFCF	-5.0827	0.0002	-3.6329	-2.9484	-2.6129	Stationary
TRD/GDP	-9.2335	0.0000	-3.6268	-2.9458	-2.6115	Stationary
INF	-7.5911	0.0000	-3.6329	-2.9484	-2.6129	Stationary
HC	-3.7325	0.0076	-3.6268	-2.9458	-2.6115	Stationary

ADF: Augmented Dickey-Fuller

The results of ADF test at the level suggest that some variables are stationer (Table 1). There are only 4 variables that fuller stationary requirement. To overcome this problem, the test continues the level of first difference.

The test results on Table 2 shows that all variables are stationer at the first difference. It indicates that all variables are free from unit root problems, so that it can be continued to the next test. To examination the optimal lag, this study sets the maximum lag to 2 for the dependent variable as well as for independent variables as suggested by Pesaran and Shin (1995). Then, a bound test cointegration concludes that there is a long-term relationship cointegrated between dependent variables (GDP growth) and independent variables. The ADRL long run estimate is shown is Table 3. Noted that the classical assumption has been conducted such as Breusch-Godfrey method to investigate the autocorrelation and Brown's stability test to examine the stability of the model.

The results in Table 3 show that almost all independent variables have a significant relationship with GDP Growth in the long run. The only insignificant variable is HC. The estimation results from the long run equation show that the variables DEBT/GDP, POPGR, GFCF and INF have a negative relationship with the dependent variable. Meanwhile, variable TRD/GDP and HC has positive relationship with dependent variable.

DEBT/GDP is the main variable in this study, which is significantly and negatively affect the GDP Growth in the long-run. The coefficient number of DEBT/GDP is -0.08904 suggests that a 1% increase in DEBT/GDP is associated 0.09% decrease in GDP growth rate. This result is in accordance with the debt overhang theory of Krugman (1988) which states that increased debt accumulation results in higher tax on future output and thus crowds out private investment and retards economic growth. This evidence of a significant negative relationship between economic

Table 3: Long-run estimation

Variable	Coefficient	Std. Error	t-statistics	Prob.
DEBT/GDP	-0.089040	0.024275	-3.667940	0.0013
POPGR	-9.861817	3.336373	-2.955850	0.0071
GFCF	-0.051355	0.019051	-2.695675	0.0129
TRD/GDP	0.092312	0.043115	2.141090	0.0431
INF	-0.182771	0.042732	-4.277120	0.0003
HC	0.009896	0.093158	0.106225	0.9163
C	1.964067	0.735603	2.670009	0.0137

growth and government debt in Indonesia is also consistent with the findings of Schclarek (2004), Aizenman et al. (2007), Reinhart and Rogoff (2010), Bal and Rath (2014), Kharusi and Ada (2018).

5. CONCLUSIONS

The main objective of this study is to examine the relationship between government debt and economic growth of Indonesia in the period 1980-2017 using ARDL method. The results of the long-run estimates show that the ratio of government debt to GDP significantly affects Indonesia's economic growth in the long run. The result also reveals that the relationship is negative which mean the increase of debt ratio reduces the growth in the long run. The research also observes a positive and significant impact of trade ratio and HC to the growth in the long-run. Meanwhile, the population growth and Inflation have a negative relationship with economic condition in the long term.

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