The Resilience of Indonesia's State Budget against Central Government Debt

Nugroho Suryo Bintoro ^{a*}

^a Universitas Brawijaya, Malang, East Java, Indonesia

INFORMASI ARTIKEL

Article history:

Date Submission: 17 June 2020

First revision: 20 August 2020

Accepted: 24 August 2020

Available online: 25 August 2020

Keywords: *central government debt, fiscal resilience, VAR*

ABSTRACT

The growth of central government debt in Indonesia is the subject of endless discussion for both economists and experts in other fields. Although the government uses this debt in order to increase Indonesia's competence through infrastructure development, there are problems in the form of previous accumulated debts. This accumulative debt is known as the concept of "debt stock" which is assessed through Indonesia's fiscal resilience (APBN) to measure the repayment capacity of new debts that will be made in the future. This ability will be seen using long-term data from 1990 to 2016 which is reflected in the variables of central government debt, government spending and revenue so that it is known that Indonesia's central government debt can still be said to be sustainable and the Indonesian government should prioritize productive expenditures in order to increase government revenues.

INTISARI

Pertumbuhan hutang pemerintah pusat di Indonesia menjadi bahan diskusi yang tiada habisnya baik bagi para ahli ekonomi maupun ahli bidang lainnya. Walaupun pemerintah memanfaatkan hutang tersebut dalam rangka peningkatan kompetensi Indonesia melalui pembangunan infrastruktur, namun terdapat permasalahan berupa hutang akumulatif sebelumnya. Hutang akumulatif ini dikenal dengan konsep "*debt stock*" dinilai melalui ketahanan fiskal (APBN) Indonesia untuk mengukur kemampuan bayar dari hutang baru yang akan dilakukan di masa yang akan datang. Kemampuan ini akan dilihat menggunakan data jangka panjang sejak tahun 1990 hingga 2016 yang tercermin melalui variabel Hutang pemerintah pusat, belanja dan pendapatan pemerintah sehingga diketahui bahwa hutang pemerintah pusat Indonesia masih dapat dikatakan *sustainable* dan sebaiknya pemerintah Indonesia lebih memprioritaskan belanja-belanja bersifat produktif dalam rangka meningkatkan pendapatan negara.

2019 FIA UB. All rights reserved.

1. Introduction

Discussion on Government Debt is again become a hot issue in Indonesia in 2017 that is since 3 years of President Jokowi's leadership. Debate emerged triggered by the huge value of debt in this time compared to the previous presidential leadership.

Directorate general data of financing management and risk of finance ministry shows that total debt of central government until September 2017 amounted to IDR 3,866.45 trillion or about US\$ 286.57 billion. The government itself has affirmed that the amount of debt carried out by the Government is still within the safe threshold as mandated by the law. However, some experts are concerned about the budget condition. This is

* Corresponding author. Tel.: +62-853-3441-6000; e-mail: nugroho.s.b@ub.ac.id

supported by various studies on fiscal sustainability in Indonesia conducted by both Indonesian researchers and those from International institution that shown Indonesian fiscal condition is not sustainable (Nurmalindah & Safuan, 2013) see also (Simarmata, 2007) and also show different result that is fiscal condition in Indonesia is sustain with a note (Marks, 2004) see also (Kurniawan, 2012).

The concerns of economic experts are very rational refers to the high dependence of the Indonesian State Budget on tax revenues that increase every year and become the dominant variable for the state budget.

Figure 1 Ratio Tax to Domestic Revenues
Source: processed from data Central Bank of Indonesia

Figure 2 Growth of Revenues and Expenditures
Source: processed from data Central Bank of Indonesia

The tax component that serves as the main revenue source of the Indonesian State Budget does not provide “good news” where the average growth of tax revenues from 1990 to 2016 is only 0.14%. this is also one of the triggers of tax amnesty in Indonesia in 2016/2017 with

one aim is to increase the number of taxpayers (Guohua & Bintoro, 2017).

On the other hand, the growth of domestic revenues is smaller than the growth in government spending that causes deficits to occur almost every year. That is, the government has two options to cover the shortfall through the printing of money (seigniorage) or by indebtedness.

The option to cover the shortfall of the state budget through indebtedness has been determined by the government of Indonesia to refer the realization of central government debt as follows.

Figure 3 Ratio Central Government Debt to GDP and Debt Payment to Government Expenditure
Source: processed from World Bank Data

The choice of debt doesn’t matter when the country is able to repay the debt and recorded since 2009, the ratio of central government debt to GDP is less than 3%. However, looking at the ration between the interest on debts paid by the Indonesian government each year on government expenditure, it is known that the value is greater than the realization of the social assistance budget. This become natural when many experts begin to pay more attention to debt management in Indonesia. Even with the government’s move to reduce subsidies, it is known that by 2016 the amount of interest paid (9.80%) is greater that the subsidy given in 2016 (9.35%).

Deficit state budget condition is accompanied by the reality that the government is always in debt and the amount of interest that must be paid will bring up a question about the condition of the Indonesian State Budget. This raise concerns that lead to speculation that when the government does not have sufficient fund to repay debt and/or interest on the debt, the government will create new debt to pay off the old debt. Thus, in this study will be explored more deeply about the fiscal resistance of the Indonesian State Budget from 1990 to 2016.

Figure 4 Ratio CGD to GDP and Debt Payment to Government Expenditure

Source: processed from data Central Bank of Indonesia

2. Theory

According to the study of fiscal sustainability in Ecuador, Alvarado et al. (2004)¹ divided debt methodology into three groups:

- The standard approach;
- The probabilistic model according to Mendoza and Oviedo (2003)²;
- The approach of a sudden stop to Calvo et al. (2002)³.

In the study of fiscal sustainability in the countries of the European Union, Bagnai (2004) uses a sustainability threshold means that according to neo-classical system (Alvarado et.al, 2004) states that fiscal policy can be considered sustainable if a country can meet budget constraints.

However, Mendoza (2003) states that the fiscal sustainability of such a statement is not appropriate. Because, this approach containing an assessment of the costs and benefits of customization option. For example, the budget can still be made meet the constraints by not paying debts or impairment of debt by raising the rate of inflation. Related to this condition, the IMF (2002) and also Croce & Juan-Ramon (2003) states that a series of policy is not sustainable if those series causes situation in the country becomes insolvent. However, the role of solvency is in the form of a requirement for sustainability because solvency condition itself can be achieved through adjustment of the value in the future. On the other hand, there is other approaches as proposed by Calvo et. al (2003) that made the foreign debt as an essential variable in the fiscal sustainability using vector auto regression (VAR) analysis.

Various opinions that have been expressed above is not only a mere statement but also had been formulated into equation as current budget constraints (Alvarado, 2004),

$$(D_{t+1} - D_t) + (M_{t+1} - M_t) = iD_t + G_t - REV_t$$

Which D is debt stock in early period^t, M is monetary base, i is interest rate from government debt, G is government expenditure, REV is taxes, net. Transfer and other revenues such as royalty, revenue from natural resources. This equation shows that deficit budget can be funded by issuing bonds or seigniorage, but the consequences of seigniorage is inflation. Thus, some scholar didn't put seigniorage as a component of budget resource. Hence, the equation:

$$(D_{t+1} - D_t) = iD_t + G_t - REV_t$$

Equation above also has negative consequences which is deficit budget will be fulfilled by new debt to pay old debt plus interest rate. So that sustainability can be achieved as required to fulfill the following intertemporal requirement

$$D_t + \sum_{k=0}^{\infty} \frac{E_t(G_{t+k} + iD_{t+k})}{(1+i)^k} \leq \sum_{k=0}^{\infty} \frac{E_t(REV_{t+k})}{(1+i)^k}$$

This formula emphasizes the absolute variable of debt.

Another formula expressed using the ratio of debt to GDP as Bagnai (2004).

$$\frac{B_t}{y_t} = \frac{1+r}{1+n} \frac{B_{t-1}}{y_{t-1}} - s_t$$

B_t is bonds, y_t is real GDP, r is real interest rate between $t-1$ and t from government outstanding debt, n is real economic growth, and s_t is primary surplus which is include seigniorage.

Analogous to the formulation of debt in the form of absolute interest intertemporal earlier, sustainability can be achieved by an iterative approach as follows.

$$\frac{B_t}{y_t} = \sum_{j=1}^{\infty} \left(\frac{1+n}{1+r} \right)^j E_t[S_t] + \lim \left\{ \left(\frac{1+n}{1+r} \right)^j E_t \left[\frac{B_{t+j}}{y_{t+j}} \right] \right\}$$

Together with the formulation of debt with the absolute value of the previous formulation of this ratio also gives the conclusion that since the value of the debt to GDP can obtain anywhere, are intrinsically intertemporal equation doesn't limit the ratio of debt to GDP, B_t / y_t in the current year.

Both formulation from Alvarado (2004) and Bagnai (2004) requiring non-ponzi game condition, which is Alvarado states as follows.

1 Alvarado, C.D., A. Izquierdo, U. Panizza. 2004. Fiscal Sustainability in Emerging Market Countries with an Application to Ecuador, Inter-American Development Bank.
2 Mendoza, E., and P.M. Oviedo. 2003. Sustainability of the national debt under uncertainty. Washington DC, the United States: Inter-American Development Bank

3 Calvo, G., A., Isquierdo, E. Talvi. 2003. Sudden Stops, The Real Exchange Rate, and Fiscal Sustainability: Argentina's Lesson, NBER working papers, w9828

$$\lim_{r \rightarrow \infty} \frac{D_{t+r}}{(1+i)^r} = 0$$

Whereas requirement for Bagnai's shows as follow.

$$\lim_{j \rightarrow \infty} \left\{ \left(\frac{1+n}{1+r} \right)^j E_t \left[\frac{B_{t+j}}{y_{t+j}} \right] \right\} = 0$$

Both formulations known as *transversality condition*.

Another scholar also notes about Neo-classical stance which is stated that the government must finance its government expenditure G_s , outstanding public debt B_s , and interest payment on its debt $B_s r_s$. To do that, it can be done by raising taxes T_s or by issuing public debt and it's called by dynamic budget constraint with notation

$$B_{s+1} = B_s(1+r_s) + G_s - T_s$$

Under plausible assumptions, this implies that over an infinitely long horizon the present discounted value of public debt must be zero which is called by the *transversality condition*.

$$\lim_{s \rightarrow \infty} \left(\prod_{s'=t}^s \frac{1}{1+r_{s'}} \right) B_{s+1} = 0$$

Then, combination this transversality condition with the dynamic budget constraint leads to the government's *intertemporal budget constraint*.

$$B_{t+1} = \sum_{s=t+1}^{\infty} \left(\prod_{s'=t+1}^s \frac{1}{1+r_{s'}} \right) T_s - \sum_{s=t+1}^{\infty} \left(\prod_{s'=t+1}^s \frac{1}{1+r_{s'}} \right) G_s$$

Study about fiscal policy also has been conducted by several researchers such as (Mahdavi, 2014)⁴ using model based approach by Bohn for testing fiscal sustainability. He was using data for panel with 48 contagious states started from 1961 to 2008 and found evidence of the effect of partisan equilibrium and state government through the ration of primary surpluses which results also show consistent evidence. (Potrafke & Markus, 2015)⁵ studying fiscal policy between states in the US and Germany is ready to pursue sustainability or not through fiscal transfers as part of the considerations made. By utilizing dynamic data panels in the two countries, an estimate is made to see primary surplus to debt. For data, they used annual data over the period 1978-2010 for U.S. states and for German states also annual data over the period 1975-2010. For the analysis, they used baseline panel data model which following form:

$$Primary.Surplus_{ijt} = \alpha_j Public.Debt_{t-1} + \sum_i \beta_{ji} Z_{it} + \eta_i + \varepsilon_t + u_{ijt}$$

They distinguish between two measures of the primary surplus denoted by standard of the primary surplus as first measurement and OLS with standard errors robust to heteroscedasticity as second estimate baseline model also models which including the lagged dependent variable for estimate dynamic panel data models. moreover, the they found that if fiscal transfer are not included in the primary surplus, the test result do not indicate that the German and U.S. state government pursued sustainable fiscal policies. Kurniawan also examines public finances in Indonesia related to problems in fiscal policy by making a diagnosis using the evolution of the main fiscal indicators on debt, expenditure and revenues – over time. The results of the diagnosis show that fiscal policy in Indonesia has been carried out conservatively and responsibly. In addition, a fiscal sustainability test was also conducted using the intertemporal budget constraint (IBC) framework by utilizing data from 1982 to 2010. This test provides a conclusion that the fiscal policy applied in Indonesia in the sample period shows sustainable results. He also found that a bad shock to expenditure had an impact on the budget deficit which is to control and maintain it, be needed strong fiscal policy to increase revenue and control government spending (Kurniawan, 2015)⁶.

3. Research Method

Following (Trehan & Walsh, 1988) in term of fiscal policy then it will be known that integrated of order zero I(0) indicates fiscal policy is sustainable. Then will be established stationary or non-stationary of the individual fiscal series by applying unit root test from Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) test.

$$\Delta X_t = \beta_1 + \beta_2 X_{t-1} + \sum_{i=1}^k \delta_i \Delta X_{t-1} + \varepsilon_t$$

Where is Δ is the first-difference operator; X_t represents the fiscal time-series encompasses: GE (government expenditures); GR (government revenues); Primary Surplus (PS); and Central Government Debt (CGD), as well as the ratio of those variables to GDP (Gross Domestic Product); β_i, δ_i are constant parameters; and ε_t is a stationary stochastic process.

4 Mahdavi, S. 2014. Bohn's Test of Fiscal Sustainability of the American State Governments. Southern Economic Journal, Vol.80, No.4, April 2014, pp. 1028-11054. Retrieved from <http://business.utsa.edu/wps/eco/0030ECO-90-2012.pdf> on September 15, 2015.

5 Potrafke, N and Reischmann, M. 2015. Fiscal Transfer and Fiscal Sustainability. Journal of Money, Credit and Banking Vol. 47, No. 5 (August 2015). SSRN (Social Science Research Network). Retrieved from

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2425560 on August 31, 2015.

6 Kurniawan, R. (2015). Sustainability of Fiscal Policy and Government Revenue-Expenditure Nexus: The Experience of Indonesia. *International Conference on Management, Economics and Finance (ICMEF 2012)* (hal. 352-376). Sarawak: Munich Personal RePEc Archive (MPRA). Retrieved September 25, 2015, from <http://mpra.ub.uni-muenchen.de/65883/>

Toda-yamamoto approach makes it possible to apply the lag option procedure to the VAR that may be integrated because the standard asymptotic theory is valid by estimating a $(k + dmax)$ th-order and the previous lag length k has been determined. $dmax$ itself is the maximum order of integration possible in the process (Yoda & Yamamoto, 1995). By generating n -vector time-series $\{Y_t\}_t^\infty = -k + 1$ then will be known.

$$Y_t = \beta_0 + \beta_1 t + \dots + \beta_q t^q + \eta_t$$

4. Results and Discussion

Fiscal policy has a goal to keep budget sustainability with a simple method by Hamilton and Flavin (1986) through unit root test. It test is currently used with Augmented Dickey-Fuller (ADF) and Phillips-Perron (intercept) such table below.

Table 1 Result of ADF and PP tests

		Unit Root Test				Test of intertemporal budget balance	
		GR	GE	S	cgd	$[(gt+rbt)-t]$	$(gt+rbt)-t-s$
ADF	t-stat	-4.15886	4.652485	5.288018	4.845033	-3.061111	-4.698831
	prob	0.0035	0.001	0.0003	0.0008	0.0423	0.001
PP	t-stat	4.107797	4.750594	-9.87729	3.671244	-3.061111	-4.690166
	prob	0.0039	0.0008	0.0000	0.011	0.0423	0.0010
order		0	0	1	(1)/(0)	0	1

Source: data processed

Variable of government revenues, government expenditures are stationary on the level and seigniorage and central government debt are stationary on the first difference. For central government debt, it is known there is a difference between ADF and PP test results that showing based on ADF the stationary achieved on the first difference and based on Phillips-Perron the stationary achieved on the level.

Based on Trehan and Wals (1988) the fiscal policy is said to be sustain when government revenues and government expenditures are at stationary condition at level $I(0)$ and statistics test shows that variable government revenue and government expenditure are $I(0)$. Then when looking at statistics above, it can be said that fiscal policy in Indonesia is sustain. But since we put additional variable for seigniorage and central government debt into equation, it will be unsustainable and it be analyzed using toda-yamamoto approach. Previously, it will be seen whether cointegration among those variables.

Table 2 Result of Johansen's Test

Sample (adjusted): 1994 2016
Included observations: 23 after adjustments
Trend assumption: Linear deterministic trend
Series: LGE LGR LS LCGD
Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.975073	156.9557	47.85613	0.0000
At most 1 *	0.896882	72.04391	29.79707	0.0000
At most 2 *	0.508168	19.79057	15.49471	0.0106
At most 3	0.140015	3.469338	3.841466	0.0625

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.975073	84.91178	27.58434	0.0000
At most 1 *	0.896882	52.25334	21.13162	0.0000
At most 2 *	0.508168	16.32123	14.26460	0.0233
At most 3	0.140015	3.469338	3.841466	0.0625

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Long-term relationship among those variables be known from Trace Statistic and Max-Eigen value that bigger than critical value. Thus, will be known short-run relationship among those variables.

While government expenditure become dependent variable, it is known than only government revenues and seigniorage that have an influence but not with central government debt. Looking at the condition in Indonesia, that government expenditures is influenced by government revenues but to support government program, the government also create new money which is known from result of LS does not granger cause of LGE about 0.0387 which means that we can reject H_0 or there is a causality between those variables.

This condition is different when variable government revenue become dependent variable where is government expenditures, seigniorage, and central government debt shows its impact to government revenues. On the other hand, central government debt gives impact when seigniorage become dependent variable but not with the reverse condition.

Granger causality gives interesting information that central government debt is affected by government spending and government revenue. This is in line with the fact that the Indonesian government will issue debt when government revenues is less than the targeted. It is intended to meet the budget for the implementation of activities that have been established by the Government.

Table 3 Result of Granger-causality Test

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 12/01/17 Time: 14:44
Sample: 1990 2016
Included observations: 23

Dependent variable: LGE

Excluded	Chi-sq	df	Prob.
LGR	19.88724	3	0.0002
LS	8.387262	3	0.0387
LCGD	5.604165	3	0.1325
All	54.86646	9	0.0000

Dependent variable: LGR

Excluded	Chi-sq	df	Prob.
LGE	34.96674	3	0.0000
LS	11.84707	3	0.0079
LCGD	9.209799	3	0.0266
All	78.39294	9	0.0000

Dependent variable: LS

Excluded	Chi-sq	df	Prob.
LGE	5.296725	3	0.1513
LGR	5.251486	3	0.1543
LCGD	9.751774	3	0.0208
All	27.54646	9	0.0011

Dependent variable: LCGD

Excluded	Chi-sq	df	Prob.
LGE	17.23624	3	0.0006
LGR	15.51293	3	0.0014
LS	1.434581	3	0.6974
All	33.49368	9	0.0001

Based on the study above, then be known how impulse responses as the table below.

Figure 5 Impulse Response

Source: processed from data Central Bank of Indonesia

5. Conclusion

The Indonesian government's decision to indebted is not too worrisome. But the government needs to be careful in managing debt because the causality of central government debt is not big for government revenue. It can be seen in how the response of government expenditure and government revenue to central government debt (vice versa) which shows negative condition in the long term.

References

- Guohua, W., & Bintoro, N. S. (2017, September). Tax Amnesty in Indonesia 2016. *Journal of American Academic Research*, 5(3), 33-38.
- Kurniawan, R. (2012). Sustainability of Fiscal Policy and Government Revenue-Expenditure Nexus: The Experience of Indonesia. *International Conference on Management, Economics and Finance (ICMEF 2012)*. Kuching: MPRA. Retrieved from <http://mpra.ub.uni-muenchen.de/65883/>
- Nurmalindah, & Safuan, S. (2013, January). Analysis of Indonesian External Balance: Intertemporal-Model Approach of Current Account. *Journal of Economic and Development of Indonesia*, 13(2), 196-213. Retrieved 05 01, 2017, from <http://jepi.fe.ui.ac.id/index.php/JEPI/article/viewFile/192/137>
- Simarmata, D. A. (2007). Fiscal Sustainability in Indonesia. *Indonesian Economic Journal*. Retrieved from <https://mpra.ub.uni-muenchen.de/41344/>
- Trehan, B., & Walsh, C. E. (1988). Common Trends, The Government's Budget Constraint, and Revenue Smoothing. *Journal of Economic Dynamics and Control*, 12, 45-444. doi:0165-1889/88
- Yoda, H. T., & Yamamoto, T. (1995). Statistical Inference in Vector Autoregressions with Possibly Integrated Processes. *Journal of Econometrics*, 66, 225-250. doi:0304-4076/95/\$09.50