

## The potential growth impact of fiscal consolidations

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### Abstract

**Purpose** — This paper analyzes the feasibility of fiscal consolidation implementation in the case of Indonesia. The main question to be investigated is whether fiscal consolidation will deteriorate economic growth or not.

**Methods** — This research uses various probabilistic models to assess the success of fiscal adjustments. Probit and logit models are used as a preliminary estimate, and the robustness checks are conducted by binary extreme value and Tobit models.

**Findings** — The results indicate that the magnitude of government revenue is less than that of government spending. They seem that increasing government revenue (taxes, for instance) is less harmful than reducing expenditures, which empirically denies what Keynesian economists approve of.

**Implication** — The results highlight that Indonesia's fiscal authority should immediately reform the economic, regulatory, and institutional environments in adopting fiscal austerity policies. The reforms are strongly required to realize fiscal health as well as to promote economic growth.

**Originality** — This paper contributes to the literature on fiscal policy in developing countries. Unlike other empirical studies, this research compares the actual output over the potential output, instead of the actual past output to evaluate the successfulness of fiscal consolidations.

**Keywords** — government revenue, government spending, fiscal consolidation, output gap, economic growth.

## Introduction

Following the Coronavirus disease (Covid-19) outbreak around the world in late 2019, fiscal policy has received much attention. Many developed countries adopt the fiscal stimulus packages, compared to monetary policy, to survive the adverse impacts emerging from Covid-19. For instance, as of October 2020, member countries of G-20 announced that the fiscal stimulus packages ranged from 7 percent of GDP in China to 13 percent of GDP in the U.S. and more than 21 percent of GDP in Japan (Szmigiera, 2020).

The high fiscal stimulus packages and, at the same time, government revenue dropped induce budget deficits. Many developed and emerging economies financed them by issuing debts. According to the Institute of International Finance (2020), in the third quarter of 2020, global debt stocks reached record levels of \$272 trillion. In response to the Covid-19 crisis, the global debt-to-GDP ratio has jumped by more than ten percentage points to 365 percent of GDP by the end of 2020. The high deficit and debts create some particular fiscal risks in the future. Accordingly, many countries

suffer from long-run fiscal sustainability problems which require substantial fiscal consolidation<sup>1</sup> (Molnar, 2012).

From an academic perspective, the above phenomena are interesting to investigate, particularly from three main economic paradigms. On the one hand, according to the traditional Keynesian view, fiscal consolidations are projected to repress economic growth. On the other hand, the Neoclassical school of thought argues fiscal consolidations must not necessarily hamper economic growth but may boost the economy, at least in the short run. Meanwhile, following the Ricardian equivalence hypothesis believed that fiscal consolidation does not affect economic growth (Bilicka, Devereux, & Fuest, 2012).

For policymakers, understanding fiscal consolidation is also crucial to know its effectiveness. Concerning the expansionary effects, if the present tax increases imply that consumers' originally perceived future tax increases will be smaller than expected, the current private consumption can increase. Regarding the intertemporal substitution effect, if fiscal adjustments are perceived as permanent and successful, real interest rates of government bonds should decrease (Alesina & Ardagna, 1998). In turn, households will tend to bring consumption forward to the current period (Alesina & Ardagna, 1998).

Since the government officially announced Covid-19 for the first time on March 2, 2020, Indonesia launched the first two fiscal packages amounting to IDR 33.2 trillion (0.2 percent of GDP), the government announced an additional package of IDR 405 trillion (2.6 percent of GDP) on March 31, 2020. They were further expanded to IDR 677.2 trillion (4.2 percent of GDP) on June 4, 2020, as part of a national economic recovery program. The national economic recovery program has been continuously refined and stands at IDR 695.2 trillion (UNDRR, 2020).

As a result, the budget deficit widened up to more than 6 percent of GDP. Also, Indonesia's debt increased significantly in 2020 as the government has ramped up spending to rescue an economy battered by the Covid-19 pandemic amid falling state revenue collection. The country's debt-to-GDP ratio was increased to 34.53 percent as of August 2020, a jump from 29.8 percent recorded in the same month in the previous year, adding that the debt ratio might reach 37.6 percent by the end of 2020. The increasing debt-to-GDP ratio is the consequence of a lower interest rate and weakening domestic currency, and the rising issuance of sovereign debt papers to cover financing needs.

The Emergency Law No. 2/2020 indeed allows the state budget deficit to widen more than 3 percent of GDP only until 2022. In 2023 Indonesia has to return to the discipline of the fiscal rule, most notably capping fiscal deficit ratio to 3 percent of GDP and debt ratio maximum of 60 percent of GDP. Our question in mind is whether, in 2023, Indonesia will implement fiscal Austerity. Indonesia is, in fact, interested in growth to recover its domestic economy from the recent recession. At the same time, the vision of becoming an advanced country in 2045 (the 100th anniversary of the independence of the Republic of Indonesia) requires an economic growth rate of at least 7 percent per annum.

Even though fiscal consolidations need not necessarily be recessionary (Khoja & Khan, 2020), Indonesia does not allow too much fiscal contraction since most government outlay is obligatory spending in nature. On the contrary, as far as economic growth is the primary concern, implementing sustainable and inclusive growth fiscal measures is likely to require an increase in government revenue, or even sovereign debts, to cover interest payments. In this case, every attempt to reduce debt ratios via fiscal consolidation has very likely resulted in a higher debt to GDP ratio through their long-term negative impact on output (Fatás & Summers, 2018). This brings us back to the ideas of fiscal Austerity.

However, different theoretical perspectives are present in the literature regarding the impact of fiscal deficit on economic growth. On the one hand, the Keynesian view suggests that an increase in government spending would positively affect the output level in an economy. According to this view, during economic recessions, the government should engage in inactive fiscal policy and conduct a budget deficit to stimulate aggregate demand (Alberto Alesina, Barbiero, Favero, Giavazzi, & Paradisi, 2017).

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<sup>1</sup> The term 'fiscal consolidation' throughout this paper is interchangeable to 'fiscal austerity' and 'fiscal adjustment'.

On the other hand, the neoclassical perspective considers fiscal deficits bad for the economy because an increase in government spending leads to borrowing, which puts pressure on the interest rate (Bernheim, 1989). As a result of the hike in interest rate, private investment is crowded out by public borrowing. Furthermore, the effectiveness of the fiscal policy is dependent on the time lag. The longer lagged response makes it difficult for the fiscal policy to be effective.

The Ricardian equivalence hypothesis posits that individuals anticipate that the increase in government expenditures through borrowing in the current period would lead to higher taxes in the future. The individuals respond to this phenomenon by decreasing demand, and therefore the net impact of fiscal expansion may be neutral (Barro, 1974). The rational expectation models also suggest similar responses to the fiscal policy.

Moreover, a variety of methodologies have been proposed to test the validity of the three theories. However, after the initial contribution by Giavazzi and Pagano (1990), several studies have found empirical evidence supporting the importance of the composition of the fiscal adjustment for the macroeconomic outcomes, particularly those addressing the issue of potential non-Keynesian effects of fiscal consolidations.

The probability of expansionary effects of fiscal consolidations was found in the literature to be higher for expenditure-based than for revenue-based consolidations. Nevertheless, the recent empirical works on the link between fiscal consolidation and economic growth can be further divided into two groups with diverging results. The first group uses cross-country panel data to study the long-term relationship between fiscal consolidation and growth. The second uses time-series data within a single country to study the short-term relationship between the two variables.

In the first group, Afonso, Nickel, and Rother (2005) assessed the determinants of the success of a fiscal adjustment. Their results suggest that expenditure-based consolidations have tended to be more successful for the Central and Eastern European countries. In contrast, revenue-based consolidations tend to be less successful. Jadhav, Neelankavil, and Andrews (2013) suggest the feasibility of attaining growth through various programs, including Austerity in the industrialized countries.

Arizala, Gonzalez-Garcia, Tsangarides, and Yenice (2021) found that fiscal consolidations based on reducing public investment have the most significant effect on output in sub-Saharan Africa, while fiscal consolidations are based on revenue mobilization are less harmful. These findings suggest that the negative impact on growth can be mitigated through the design of fiscal adjustment. More recently, Nie (2020) obtained empirical evidence supporting the expansionary fiscal contraction hypothesis for OECD countries: results for output are driven by changes in tax rates and are robust to how one defines a high-debt regime and how one measures Austerity.

Most of the empirical evidence tends to confirm that expenditure-based strategy than revenue-based in fiscal adjustments. However, Wildowicz-Giegiel (2019) confirmed that fiscal Austerity in the Eurozone countries initiated to reduce the public debt to GDP ratio does not contribute to macroeconomic stabilization and adversely affects the potential output. Contrary to widely held opinion, this allows the claim that Austerity is not a good remedy for economies suffering from a recession.

Ardanaz, Hallerberg, and Scartascini (2020) corroborated macro results with micro evidence from an original survey experiment that measures voter's fiscal policy preferences over the business cycle in seven countries across Latin America. They paid more attention to how fiscal adjustments episodes are implemented, both in terms of their design and timing. Their experimental evidence shows that respondents preferred expenditure cuts to tax increases during downturns, the opposite of the type of consolidations that countries typically pursue.

Departing from the supply-side economy, Bardaka, Bournakis, and Kaplanoglou (2021) presented evidence of both short-run and long-run negative effects of fiscal consolidation on total factor productivity (TFP). The short-run impact is disproportionately more damaging for the TFP of low debt countries. Contrary to the expansionary austerity thesis, their empirical results would advise against spending-driven fiscal consolidation since such consolidation undermines capacity due to the importance of government spending in shaping productive capital.

In the second group, Boulila and Benbouziane (2018) found that neither increasing taxes cuts nor reducing expenditures is a solution for the crisis for Algeria that confirms empirically what Keynesian economists approve of. Papaioannou (2019) investigated the influence of public expenditure on economic growth using Markov Switching regression and quarterly data for Greece. The results showed that the effects of government spending on economic growth are asymmetric over the business cycle.

Acocella, Beqiraj, Di Bartolomeo, Di Pietro, and Felici (2020) concluded that plans to reduce the public debt in Italy based on tax increases are more effective than expenditure reductions. Tang, Liu, and Cheung (2010) investigate the effectiveness of fiscal policy in five Southeast Asian countries of Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Through a structural vector autoregression model, government spending is found to have a weak and largely insignificant impact on output. In contrast, taxes are found to have outcomes contrary to conventional theory.

In the case of Indonesia, Surjaningsih, Utari, dan Trisnanto (2012) indicated the absence of discretionary fiscal policy. Their study also concluded that in the short-term adjustment, an increase in government spending positively affects output, while a tax increase has a negative effect. Therefore, government spending is more effective in stimulating economic growth, especially in times of recessions. In contrast, Kuncoro dan Pambudi (2014) showed that a decrease in government expenditure would positively impact real private investment and export volume.

In other avenues, the widening fiscal deficits induced by government spending in the last decade encourage some scholars' concern about fiscal sustainability. Basri and Rahardja (2011) suggest improving the quality of spending to control the fiscal deficits. To contribute to a greater economic stabilization, fiscal space can be maintained by converting unproductive spending into productive spending. Kuncoro (2014) indicated that the relative efficiency scores of taxes revenue is lower compared to nontaxes revenue. In his subsequent paper, he alternatively recommends tax counterbalancing as a strategic way not only to manage fiscal deficits but also to enlarge fiscal space (Kuncoro, 2019).

A brief review of macroeconomic theory and empirical evidence above suggests that the impact of fiscal consolidation programs on short-term economic growth is ambiguous. While there seems to be consensus on the larger role for expenditure cuts, the results are less homogenous at the more disaggregated level. The mixed empirical results of the implementation of fiscal consolidation in various countries encourage this study to reexamine them. Even though the successful fiscal consolidation is determined by some important factors (initial fiscal condition, duration, magnitude, composition, and credibility), how it will be carried out without jeopardizing economic growth remains the major issue.

## Methods

In order to understand the long-run effects of fiscal consolidation on economic growth, one strategy is to compare growth in several consolidation episodes with growth in those episodes without consolidation (Kleis & Moessinger, 2016). This investigation, however, would not produce credible insights since the approach could suffer from a selection and/or reverse causality bias. To cope with these problems, it is important to identify what has been happening in a consolidating country in the absence of fiscal consolidation. In this setting, the endogenous decision to consolidate is of minor importance.

Meanwhile, this comparison is not possible using standard estimators without relying on strong, and in most cases, implausible assumptions, a variety of methodologies have been proposed to identify different aspects in the literature. In the light of this, we now turn to design empirical research on the conditions under which fiscal consolidations have not been expansionary yet. In this setting, the expansionary fiscal consolidations can be well investigated.

This study is interested in the impact of fiscal Austerity (expenditure-based and revenue-based) on the economic activities represented by gross domestic product. Therefore, this investigation uses three macroeconomic variables: gross domestic product (*GDP*), government

expenditures (*G.E.*), and government revenues (*G.R.*) as employed by Boulila and Benbouziane (2018):

$$\text{Log } GDP_t = \alpha + \beta \text{Log } GE_t + \gamma \text{Log } GR_t + \varepsilon_t \quad (1)$$

Transforming into growth rate, (1) would be:

$$\Delta \text{Log } GDP_t \equiv \text{Growth}_t = \alpha + \beta \Delta \text{Log } GE_t + \gamma \Delta \text{Log } GR_t + \varepsilon_t \quad (2)$$

where  $\Delta$  is the first difference operator and  $\beta$  and  $\gamma$  are the fiscal multiplier, respectively.

Equation (2) is understood that higher real GDP growth is of crucial importance for the success of consolidation efforts, notably given also the denominator effect in this context. This is particularly critical because the impacts of austerity measures are not the same in all stages of the economic cycle (Auerbach & Gorodnichenko, 2013).

For our econometric analysis in this context, we assume that a fiscal adjustment is successful if there is an improvement in real or actual GDP so that it is greater than the potential one, instead of referring to the past real or actual GDP.

Since we concern with the success of economic growth instead of its magnitude, the corresponding variable is then transformed into a binary variable:

$$\text{Growth}_t^* = \begin{cases} GDP > GDPp; 1 \\ GDP < GDPp; 0 \end{cases} \quad (3)$$

where  $GDPp$  is the potential GDP.

Having determined the nature of the fiscal consolidation episodes as either successful or unsuccessful, we can also assess their potential determinants. Therefore, the estimate is as follows:

$$\text{Growth}_t^* = \alpha + \beta \Delta \text{Log } GR_t + \gamma \Delta \text{Log } GE_t + \varepsilon_t \quad (4)$$

Our model allows not only to send a signal of fiscal adjustment but also to evaluate the feasibility of which measure is more effective. Based on formula (4), it can be observed that fiscal consolidations tend to bring reductions in debt ratios only if economic growth is strong and the output gap increases. If the output gap falls, fiscal consolidations have an associated lower drop in the debt ratio.

To identify potential output, this study adopts Hodrick-Prescott (H.P.) filtering method. This method is widely used among macroeconomists to obtain a smooth estimate of the long-term trend component of a series. The method was first used in a working paper (circulated in the early 1980's and published in 1997) by Hodrick and Prescott (1997) to analyze postwar U.S. business cycles.

Technically, the H.P. filter is a two-sided linear filter that computes the smoothed series  $\tau$  of  $y$  by minimizing the variance  $y$  of around  $\tau$ , subject to a penalty that constrains the second difference of  $\tau$ . The H.P. filter then chooses  $s$  to minimize:

$$\sum_1^T (y_t - \tau_t)^2 + \lambda \sum_2^{T-1} [(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})]^2 \quad (5)$$

The penalty parameter  $\lambda$  controls the smoothness of the series  $\tau$ . The larger the  $\lambda$ , the smoother the  $\tau$ . As  $\lambda = \infty$ ,  $\tau$  approaches a linear trend. The default value of  $\lambda$  in Eviews is set to be 1,600 for quarterly data.

The binary response regression model as (4) will be estimated by the logit model. The logit model uses the logistic probability distribution to estimate the parameters of the model. Although seemingly nonlinear, the log of the odds ratio, called the logit, makes the logit model linear in the parameters. The marginal effect of a regressor in the logit model depends not only on the coefficient of that regressor but also on the values of all regressors in the model.

$$\pi = \Phi(\alpha + \beta \Delta \text{Log } GR_t + \gamma \Delta \text{Log } GE_t) \quad (6)$$

An alternative to the logit model is the probit model. The underlying probability distribution of probit is the normal distribution (independent variables in the model). The difference lies in the fact that logistic function has harder "fat tails". The parameters of the probit

model are usually estimated by the method of maximum likelihood. Similar to the logit model, the marginal effect of a regressor in the probit model involves all the regressors in the model.

$$\pi = \frac{1}{1 + e^{-(\alpha + \beta \Delta \text{Log GR}_t + \gamma \Delta \text{Log GE}_t)}} \quad (7)$$

The logit and probit coefficients cannot be compared directly because the logarithmic distribution has a variance equal  $\pi^2/3$ . Multiplying the probit coefficients by 1.81 makes them then comparable with the logit coefficients. In practice, the logit and probit models give similar results. There are no significant differences in practice, only in the case that the sample contains numerous observations with extreme values. The choice between them depends on the availability of software and the ease of interpretation (Gujarati, 2014).

For this study, the variable of interest is specified as follows. The government revenue covers taxes and nontaxes received, including grants. The term ‘government expenditure’ used in this study is central government outlay comprising general consumption or recurrent expenditure realization (mostly allocated onto wage/salary and goods/services purchase) and capital expenditure, excluding interest payment. Inclusively, we also assess the spending of transfer to regions. The primary balance budget is the difference between total government spending (excluding interest payment) and government revenues. Overall balance budget deficit is the difference between total government spending and government revenues. The fiscal data are taken from the Ministry of Finance.

The selected key macroeconomic variable is GDP. The GDP is used as the main factor for the government to set the state budget projection for the next year. The GDP data is available on a quarter-basis. Those variables are presented at a 2010 constant price. The GDP data are taken from the Central Board of Statistics. Price levels are derived from the GDP in current price divided by GDP in constant prices (2010=1). The deflator index is also used to convert all variables into the real values. The sample periods were chosen for this study extend from 1983(1) to 2019(4). The year 1983 is set as the starting observation merely related to the data availability. The total observation is 148 sample points.

## Results and Discussion

Table 1 provides descriptive statistics for each variable of interest. The mean values of government expenditure and government revenue ratios are not far from each other. This makes sense. In the state budget preparation, the government expenditure is determined first based on the projects list proposed by ministries and governmental institutions, followed by estimating the government revenue. Then, the government in the current fiscal year collects tax/nontax revenue to fulfill the government expenditure. If the government expenditure is greater than government revenue, the government will experience budget deficits that will be financed by domestic and foreign debts.

**Table 1.** Descriptive Statistics of Fiscal Variables to GDP Ratio

	GR	GE	PB	DEF
Mean	0.204	0.193	0.011	-0.015
Median	0.154	0.142	0.010	-0.013
Std. Dev.	0.134	0.132	0.056	0.059
Skewness	1.529	1.879	2.014	1.992
Kurtosis	4.659	6.041	12.092	11.562
Jarque-Bera	74.646	144.149	609.855	549.932
Probability	0.000	0.000	0.000	0.000

Source: data analysis

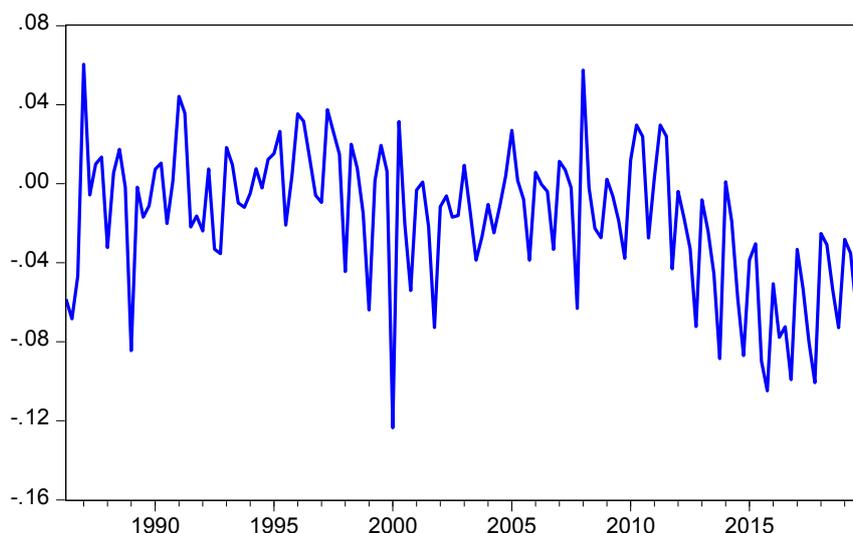
A consequence of debt financing generates interest payments. When interest payment is excluded from government expenditure, a primary balanced budget will be achieved. The mean value of the primary balance ratio is about 1 percent of GDP while the overall balance budget is -1,5 percent on average. Along with the current increases in deficit and debt, the interest payment

will also be increasing. As a result, the primary balance will be minus as occurs in recent years, implying the government uses debt to cover interest payment.

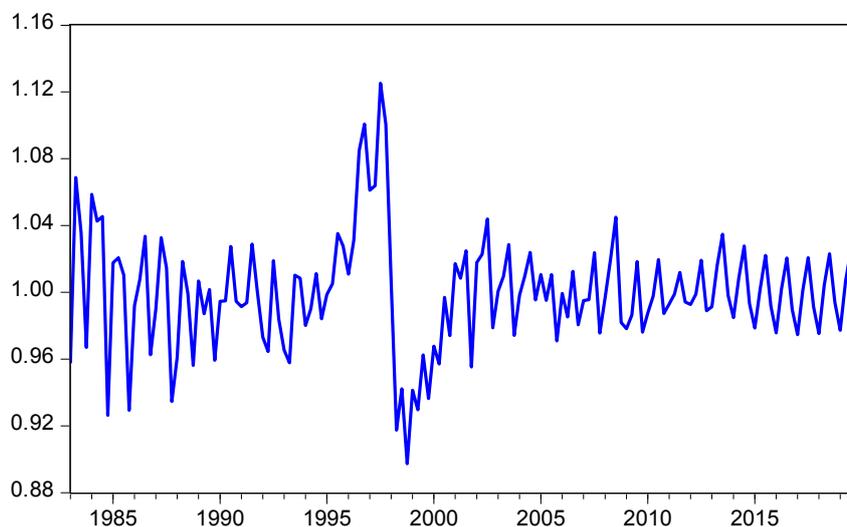
The tight fiscal space which is represented by the increase in primary balance deficits strongly suggests mobilizing government revenues. The lower skewness, kurtosis, and greater standard of deviation compared to government expenditure indicate that government revenue has a big potential to be the main source in financing government expenditure. While most central government outlays are mandatory spending in nature, fiscal consolidation through revenue-based, at this point, is more reasonable. This will be described further in the next section.

Figure 1 presents overall balanced budget deficits in more detail. The overall balance budget ranges from (deficit) -12 percent to (surplus) 0.6 percent of GDP. The worst deficit ratio took place in 1998 in accordance with the Asian monetary crisis. The highest surplus ratio occurred in the mid-1980s when the new tax law was implemented. More recently, the largest surplus ratio was enjoyed in 2012 when the commodity boom began. It seems that the government budget deficit is heavily dependent on some external factors.

The above results implicitly offer some fundamental implications. The government can use the overall balanced budget of plus/minus 10 percent as the preliminary reference for carrying out the active fiscal policy. The active fiscal policy might be conducted by fiscal adjustment through either revenue-based or expenditure-based. Each of these policies will be described further in the next section. However, implementing pro-growth, pro-job, and pro-poor fiscal measures is likely to require an increase in government revenues rather than spending cuts.



**Figure 1.** Overall Balance Deficit Ratio (%)



**Figure 2.** Actual Output to Potential Output Ratio

Figure 2 displays the dynamics of the actual output to potential output ratio. The output gap was low in the early 2000s, associated with the economic recovery process from the impacts of the 1997/1998 Asian monetary crisis. The output gap tended to be high, approximately 4 percent ahead of the 2009 global financial crisis. In such a case, promoting actual output above or at least equal to the potential output would be an appropriate goal for fiscal consolidation.

A brief visual inspection of both Figure 1 and 2 combinations overall concludes that fiscal policy in Indonesia during the sample observation periods is typically a-cyclical or even pro-cyclical, as found by Akitoby, Clements, Gupta, dan Inchauste (2006), and Baldacci (2009). The pro-cyclicality induced deficit bias, and further, the stabilization goal of fiscal policy would become destabilizing, demanding fiscal Austerity. It will be checked again more deeply by using statistical methods.

According to Şen and Kaya (2013), Granger causality can be explored to test the ability of revenue to be a stabilizer instrument. Table 2 reports the standard Granger causality test results for the revenue to actual output and potential output. Since the Granger causality test is very sensitive to the selection of lag lengths, the lag lengths are determined by Akaike Information Criteria (AIC). The standard Granger causality test results show a unidirectional causality running from government revenue to potential output instead of actual output. It means that government revenue prospectively could be a fiscal stabilizer instrument in the future, as suggested by (Kuncoro, 2019).

Slightly different results are found in the context of government spending. There is a unidirectional Granger causality running from government expenditure to both actual output and potential output. The larger spending exerted by the government, the higher the output. However, the higher output does not necessarily require the government to spend more to facilitate economic activities. Hence, we can say that government spending is independent of economic conditions.

They imply further that the expenditure-based fiscal consolidation can be conducted anytime regardless of the economic conditions, either in recessions or in the economic booms. Our analysis seems to disagree with the conventional wisdom that longer consolidations are initiated when public debt is high, fiscal deficits are large, the heavy interest burden, and long-term sovereign bond yields are elevated (Lodge & Rodriguez-Vives, 2013).

**Table 2.** Causality Tests of Revenue and Expenditure to GDP

Null Hypothesis:	Obs	F-Stat	Prob.
$\Delta(\log((GE)))$ does not Granger Cause $\Delta(\log(GDP))$	144	3.512	0.017**
$\Delta(\log(GDP))$ does not Granger Cause $\Delta(\log((GE)))$		1.784	0.153
$\Delta(\log(GR))$ does not Granger Cause $\Delta(\log(GDP))$	144	0.976	0.406
$\Delta(\log(GDP))$ does not Granger Cause $\Delta(\log(GR))$		2.933	0.036**
$\Delta(\log(GR))$ does not Granger Cause $\Delta(\log(GDPp))$	143	2.533	0.043**
$\Delta(\log(GDPp))$ does not Granger Cause $\Delta(\log(GR))$		0.667	0.616
$\Delta(\log((GE)))$ does not Granger Cause $\Delta(\log(GDPp))$	143	3.658	0.007***
$\Delta(\log(GDPp))$ does not Granger Cause $\Delta(\log((GE)))$		0.465	0.761

Note: \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

So far, we have discussed the feasibility of fiscal consolidation in Indonesia partially using narrative approaches. In the preceding section, we examine the growth impact of fiscal consolidation. Table 3 summarizes the estimation result of probit and logit models. On the one hand, the likelihood of an output gap decreases with higher government revenues. This means that the tax or nontax intensification and extensification that cause government revenue growth tend to hasten the necessary fiscal consolidation.

On the other hand, the increase in government spending exerts a positive and significant effect on the likelihood of fiscal consolidations. Thus, higher government spending appears to act as a fine-tuning stabilizer, as it reduces the need for any reform-driven change in domestic demand. This finding is consistent with the result of most empirical studies outlined in the previous section.

However, the size of spending cuts seems to matter more than those of tax increases. This suggests that policy shift towards a more efficient collection, progressive tax rate, and less distortionary tax system. Fiscal consolidations do not necessarily increase the tax rate. Broadening the tax base by fighting tax avoidance and tax evasion plays a vital role in fiscal adjustments. Additionally, structural reforms reduce the deadweight loss of the tax system for the economy by eliminating rents and inefficiencies. In this way, the increase in government revenues can significantly reduce the deficit and debt ratios.

**Table 3.** Estimation Result of Probit and Logit Models

Models	Probit		Logit	
	Coeff.	Prob.	Coeff.	Prob.
C	-0.117	0.272	-0.190	0.272
$\Delta \log$ (GR)	-0.459	0.066*	-0.776	0.069
$\Delta \log$ (GE)	0.852	0.002***	1.402	0.004***
McFadden R <sup>2</sup>	0.053	-	0.053**	-
S.D. Dep. Var.	0.500	-	0.500	-
LR statistic	10.754	0.004***	10.758	0.004***
Obs with Dep = 0	79		79	
Obs with Dep = 1	68		68	
% Correct	53.74		53.74	
% Incorrect	46.26		46.26	

Note: \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

We re-estimate the same set of specifications using traditional binary extreme value and Tobit models as a robustness check. The results of which are presented in Table 4 seem to approximate those of probit and logit models. The sign and magnitude of the corresponding coefficients are close to each other. This is supported by a scale parameter that is close to unity (0.93). The scale parameter is identified in censored and truncated regression models and is estimated along with the regression coefficient.

In general, there are no qualitatively major changes in the results and conclusions. Tax-driven reforms increase the probability of successful fiscal consolidations by assuming other things are constant. The size of composition matters significantly for revenue-based rather than spending-based. All in all, our conclusions are robust, independently of the econometric model used.

**Table 4.** Estimation Result of Binary Extreme Value and Tobit Models

Models	Binary Extreme Value		Tobit	
	Coeff.	Prob.	Coeff.	Prob.
C	0.255	0.030**	0.044	0.666
$\Delta \log$ (GR)	-0.424	0.073*	-0.358	0.059*
$\Delta \log$ (GE)	0.892	0.002***	0.717	0.002***
Scale	-	-	0.927	0.000***
McFadden R <sup>2</sup>	0.054	-	-	-
S.D. Dep. Var.	0.500	-	-	-
LR statistic	11.057	0.004***	-	-
Obs with Dep = 0	79		79	
Obs with Dep = 1	68		68	
% Correct	53.74		-	
% Incorrect	46.26		-	

Note: \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

The above findings offer some important implications for reforming public finances. At present, Indonesia only has the automatic stabilizers in its taxation through progressive income tax. However, the corporate income tax is no longer progressive since 2020, with a single rate of 22 percent. The personal income tax has already been progressive, but its contribution to tax revenue

is very low. Hence, reforming the tax system will boost fiscal health without sacrificing economic growth too much.

On the spending side, the country does not have automatic stabilizers yet, as is typically the case in developing economies. Inadequate fiscal space, relatively small population, and a high share of public spending as a share of GDP needs more time to implement in Indonesia, at least within the medium term. The local governments are still heavily reliant on central government fiscal transfer that covers around two-thirds of their budget. Their current aggregate own-source revenue stands at only 2.4 percent of GDP. In short, better spending is the key solution.

Under those circumstances, the post-Covid-19 pandemic seems the perfect time for Indonesia to run fiscal adjustments. All in all, for the time being, Indonesia's fiscal stabilizers still rely on discretionary fiscal measures due to the automatic fiscal stabilizers being limited. Accordingly, it is not surprising that countries with weak automatic stabilizers have enacted larger fiscal stimulus programs (Dolls, Fuest, & Peichl, 2012).

## Conclusion

Fiscal policy has received much attention in recent years. The use of large fiscal stimulus packages to dampen the adverse impact of the Covid-19 pandemic recently has raised concerns about the long-run fiscal sustainability. The high budget deficit and debt ratios inevitably need to restructure into manageable levels, which require substantial fiscal consolidation measures.

This paper aims at analyzing the feasibility of fiscal austerity implementation to mitigate future economic consequences in the case of Indonesia. We explore various probabilistic models to assess the success of fiscal adjustment subject to expenditure-based and revenue-based. Our models not only generate a signal of fiscal adjustment success but also evaluate the feasibility of which measure is more effective.

By applying probit and logit models for the quarterly data, we found that increasing taxes is less harmful than reducing expenditures, which empirically denies what Keynesian economists approve of. Our findings are robust when we recheck using the extreme binary value and Tobit models. Hence, we empirically deny what Keynesian economists approve of. Fiscal consolidations must not necessarily hamper economic growth. In contrast, fiscal adjustments may boost the actual output greater than the potential output, at least in the short run. However, Indonesia's fiscal authority has quickly reformed economic, regulatory, and institutional tax ecosystems in adopting fiscal austerity policies to achieve fiscal health without jeopardizing economic growth.

This paper focused only on fiscal variables. The analysis of fiscal consolidation here isolates the effects of other factors affecting the economy: the exchange rate, monetary policy, health of public finances, availability of bank lending, and so on. Further research might control these factors, so the analysis of fiscal Austerity in Indonesia can provide deeper insights into this empirical question.

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