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The Economic Impacts of Government Spending Cut: The Case of Indonesia

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Abstract
This paper attempts to analyze the impact of fiscal policy on the macroeconomic performance in Indonesia. Using CGE EMERALD (Computable General Equilibrium Model with Economic Regional Analysis Dimensions), we simulate the impact of 1 percent deficit reduction (i.e. government expenditures cut) on macroeconomic variables both in national and regional levels. The overall simulations show that the decrease in government expenditures has positive impacts on real private investment expenditures and export volume as well as aggregate capital stock. Also, the decrease in government expenditures reduces import volume higher than that of export. In relation to employment, the negative impact is marginally only on the non-tradable sectors. Those findings imply that not all government expenditures are productive in nature. Hence, they perform the feasibility of government policy to reduce the government spending and conduct balance budget as well as counter-cyclical policies in the future not only to maintain economic growth in general but also balance of payment and fiscal sustainability in particular.

Keywords: government spending, deficit, private expenditures, crowding out, CGE.


1. Introduction
Rising budget deficits in both developed and developing countries induced by excessive government expenditures have drawn considerable attention in recent years. The main question is whether government spending (broadly speaking fiscal policy) is really effective to stabilize macroeconomic condition in particular during global financial crisis in the late of 2008. In fact, most country in the world implemented fiscal stimulus packages as counter-cyclical fiscal policy (Christiano et al. 2011).
In the theoretical perspectives, it is widely accepted that fiscal policy is less popular compared to monetary policy to control economic fluctuations. Besides the longer policy lags than monetary policies, the failure of fiscal policies in Latin America during the 1980s and Japan during the 1990s gave a negative experience to fiscal authorities for controlling business cycles. Moreover, the government failure to intervene economy is often far stronger and more harmful than potential market failure (Gingrich 2007).

However, the ineffective monetary policy in the case of the zero lower bound on nominal interest rate in recent years has encouraged policy makers to rely on fiscal policy. While in advanced countries private sector led economic growth, in developing countries, by and large, government dominates the economy. Therefore, it is not surprisingly that in emerging countries fiscal rules policy tends to amplify business cycle fluctuations whereas in developed countries fiscal rules policy tends to mitigate aggregate instability (Kaminsky et al. 2004).

Along with world economic recovery and tapering fiscal policy pioneered by US recently; the potential issue will be shifted to the possibility of conducting fiscal austerity policy through tax hike or spending cut or both (labeled fiscal corrections, fiscal adjustments, or fiscal consolidations). Surprisingly, very little is known about the effects of fiscal austerity policy on economic activity and on the short- versus long-run stabilizing behavior of fiscal policy in emerging market countries.

As we shall see later, some scholars argue that tax hike will lead to extended recessions. On the contrary, others provide numerous empirical evidences that cutting spending in order to reduce a country’s debt-to-GDP ratio or to grow a country’s economy has failed. With regard to its substantial economic impacts, it is necessary to identify whether fiscal austerity policy can effectively offer a better precondition to achieve economic growth in the short-run and stabilization in the long-run.

Indonesia provides a unique opportunity to examine the nature of fiscal policy. Asian financial crisis in 1997/98 has directed government expenditures to focus on the economic recovery. At the same time, the external debt increased significantly from more than US$ 136 billion in 1997 to more than US$ 151 billion in 1998, mainly due to the depreciation of Rupiah (see: Kuncoro 2011). After the bad experiences, the government and parliament made a political decision that the most deficits should be financed by the domestic financial resources. As a result, the domestic debt stock has been ten times only during one decade.

The sharp increase in fiscal deficits and public debt in that period has raised concerns about the sustainability of public finances and highlighted the need for a significant adjustment over the medium term. According to the Law No. 17/2003, since 2004 Indonesia has been implementing a fiscal rule based on maximum deficits and debt ratios. Accordingly, she shifted her budget deficit financing strategy from the multilateral and bilateral foreign debt to the market financing debt in 2005 by issuing bond both in the domestic and global markets.

When the global financial crisis erupted in late 2008, the government attempted to revive economic activity through various fiscal stimulus measures (amounting 73.3 trillion Rupiah or equivalently 1.4 percent of GDP). The fiscal stimulus programs have contributed substantially to Indonesia faster and stronger than expected recovery (Hur et al., 2010). After that, gradually Indonesia in 2010s is one of the largest developing countries to implement various economic liberalization reforms that produce strong economic growth (Abdurohman 2013).

Furthermore, in 2015 the General Directorate of Tax was split up from Ministry of Finance becoming an autonomous institution, i.e. Board of National Receipt (Badan Penerimaan Negara). With the widened mandates, the board is expected to have an additional power to boost state budget revenues, primarily tax collection. All of them are subjected to rebalance the structure of state budget to realize sound fiscal policy. Therefore, lessons from Indonesia will be useful to develop a better adjustment fiscal policy design.

In line with the public sector reformations which are currently taking place, numerous efforts are devoted to the revenue sides. In contrast, the expenditure sides are paid a little attention to. Therefore, knowing effectiveness of fiscal policy from expenditure side is interesting. In its most basic form, the effectiveness of fiscal policy corresponds to the change in spending for a change in output. If the effectiveness is high, the expenditure side of fiscal policy has a little effect on the real economy; it means that the design of spending cut policy will not disturb the economy. Moreover, in the case of Indonesia where the revenues availability is set after the expenditures assignment, the effectiveness of government expenditures is a crucial point to maintain the fiscal sustainability.

The aim of this paper is to analyze the economic impact of conducting fiscal correction through government spending cut in the case of Indonesia in order to achieve the fiscal sustainability in the short-term and economic growth in the long-term. To obtain the comprehensive impact throughout economy, this paper uses inter-regional computable general equilibrium. The rest of this paper is organized as follows. Section 2 highlights
the existing literature as well as previous empirical results. The methodology is described in the next section. This is followed by discussing the main empirical results. Finally, some concluding remarks are drawn.

2. Literature Review

In its most basic form, governments have three options to run their state budget: deficit, surplus, and balanced. Budget deficits (surplus) occur when government expenditure exceeds (greater than) revenue. A balanced budget is a budget where revenues equal expenditures. These three definitions are just literal. However, there is neither a budget deficit nor a budget surplus; in other words, ‘the accounts balance’. More generally, it refers to a budget with no deficit, but possibly with a surplus.

As advocated by Keynesian economists, a cyclically balanced budget is not necessarily balanced year-to-year, but is balanced over the economic cycle, running a surplus in boom years, and running a deficit in lean years, with these offsetting over time. They argue that increasing government spending and decreasing taxes can minimize the painful effects of a recession. By balancing deficits in recessions and surpluses in growth, Keynesians believe that the government can obtain the benefits of a balanced budget without facing the risks of making recessions worse due to spending and revenue limitations.

Refer back to the literal definitions above; the only two ways to balance the state budget are to spend less or to collect more. Theoretically, the magnitude of the two ways will be same. According to economic principles, the magnitude of the tax (government expenditure) multiplier depends on the size of the marginal propensity to consume, marginal propensity to invest, marginal propensity to import, and the marginal tax rate, etc. Different multipliers result in different realizations of tax (government expenditure) collection.

In the empirical strand, however, the results are very different. Dealing with collect revenue more, many studies focus on tax. The earliest work on the economic effect of taxes on growth is by Harberger (1964). He observed that the degree of effect of indirect tax on investment is insufficient to stimulate economic growth. In contrast, Koester and Kormendi (1989), Levine and Renelt (1992), Easterly and Rebelo (1993), Slemrod and Yitzhaki (1995), Mendoza et al. (1997), and Kneller et al. (1999) conclude that there is either a positive or in most cases an insignificant correlation between the average level of taxation and output dynamics both in the short and the long run.

On the other hand, several later studies provide mixed evidences of the taxes–growth nexus. King and Rebelo (1990), Barro (1991), Plosser (1992), Engen and Skinner (1992), Kormendi and Meguire (1995), Wright (1996), and Leibfritz et al. (1997) find a negative correlation. The inconclusive results are likely due to the different and often not fully adequate tax measures. According to Mendoza et al. (1997), the main obstacle in empirical research on growth effects of tax policy is the difficulty to construct adequate tax variables. Most theoretical propositions are based on marginal tax rates whereas most empirical studies rely on either average or statutory tax rates.

Those works in general estimate directly the impact of an increase in tax on economic growth. The channel through which the change in tax policy might affect growth could be analyzed indirectly by connecting it to investment. Romer and Romer (2010) analyze the causes and consequences in the level of taxation in the postwar US. Their results indicate that tax changes have very large effects on output. At the same time, output effects are very persistent. They argue it is due to the strong response of investments to the tax burden decrease. It seems that Laffer curve holds; raising taxes would lead to an incline in tax revenue.

Cutting spending is not easy and different types of austerity measures produce very different results. When the fiscal austerity is intended to lower debt-to-GDP ratios, Alesina and Ardagna (2010) show that the deficit reductions that successfully lower debt-to-GDP ratios without sparking recessions are those that combine spending reductions with such measures as deregulation, the liberalization of labor markets (including, in some cases, explicit agreement with unions for more moderate wages), and tax reforms that increase labor participation.

On the other hand, when the fiscal austerity is devoted to maintain economic stabilizations, a spending-based fiscal correction might have mild recessionary effects but would quickly give way to growth (Alesina et al. 2012). Keep in mind that GDP is the sum of consumption, investment, government spending, and net exports. Thus, any decrease in government spending is ‘baked in’ as a decrease in GDP, even if it has no effect on the rest of the economy. Their results imply that the void left by decreased government spending is filled within a year by increased investment and consumption, and the economy continues growing.

In a different point of view, Krugman (2012) has strongly rejected the budget cuts during recession. Continuing the Keynesian line, he believes that the only way to stimulate the aggregate demand is the increase of
government spending rather than its reduction. He suggests spending more to fix the economy especially the spending for public investment in order to stimulate the economy by spillover effects of growth. Even though the solution seems simple and effective in isolated recession contexts, this solution has proved itself impossible given that distressed states have not had a corresponding fiscal space or reliable financial markets.

The analysis of impact of tax-hike or spending cut on output growth solely does not provide a unique direction. Some scholars advance the analysis by comparing the two methods of deficits reduction. Blanchard and Perotti (1999) use mixed structural VAR approach to identify the automatic responses of taxes and government spending to economic activity. They also argue that positive government spending shocks have a positive effect on output, and positive tax shocks have a negative effect, while the multipliers for both spending and tax shocks are typically small.

While analysis of Blanchard and Perotti (1999) is based on the multiplier effect, Alesina and Ardagna (2013) prefer to use business confidence as mile-stone. They argue business confidence plummeted during the tax-based adjustments and rose (or at least did not fall) during the expenditure-based ones. When governments cut spending, they may signal that tax rates will not have to raise in the future, thus spurring investors (and possibly consumers) to be more active. Their findings on business confidence are consistent with the broader argument that US firms, though profitable, are not investing or hiring as much as they might right now because they are uncertain about future fiscal policy, taxation, and regulation.

Guajardo et al. (2014) posit the composition of the consolidation strategy. They identified episodes from 1980 to 2005 in which 17 developed countries had aggressively reduced deficits. They classified each episode as either ‘expenditure-based’ or ‘tax-based’, depending on whether the government had mainly cut spending or hikes taxes. They find that the expansionary effects of fiscal consolidations may be exaggerated. Hence, while the expansionary consolidation hypothesis seems to have become untenable, the debate has shifted towards the role of the composition of the consolidation strategy in affecting the macro-economy.

Alesina et al. (2012) turned out that the two kinds of deficit reduction had starkly different effects; cutting spending resulted in very small, short-lived recessions (if any), and raising taxes resulted in prolonged recessions. They also indicate that spending-based adjustments cause less contractionary effects than revenue-based adjustments. Those challenge the conventional wisdom that either raising tax or spending cut approaches does not have different results. Accordingly, government expenditure cut seems to be less costly and potentially to implement in developing countries like Indonesia.

In the case of Indonesia, the related studies concerning the economic impact of fiscal policy have been conducted extensively. Most of the works has been concentrated partially on the inflation rate (Snyder, 1985), private investment (Ikhsan and Basri, 1991), private consumption (Adji, 1995), current account (Adji, 1998), exchange rate (Abimanyu, 1998), domestic absorption (Kuncoro, 2000), tax revenue (Saleh, 2002), and interest rates (Adiningsih, 2010).

More recently, Basri and Rahardja (2011) argue that tax cut also remains being effective to stimulate short-term economic growth particularly in the recession periods. In contrast, Surjaningsih et al. (2012) conclude that government spending is more effective to stimulate economic growth especially in times of recession, compared to taxation policies. Despite the tax-GDP ratio is relatively stagnant for some recent years, the efficiency of tax revenue is the lowest compared with other government financial source, i.e. foreign debt, domestic debt, and non-tax revenue (Kuncoro, 2014). Kuncoro (2014) hence suggests that increasing taxes does not substantially deteriorate economic growth.

In relation to the tax cut as a part of fiscal stimulus policies following global financial crisis implemented in 2009, Hidayat and Ramadhan (2010) found that that personal income tax cut policy induce the household consumption. Unfortunately, the increase in household consumption is lower than the decrease in government expenditure, investment, and net export. Using inter-regional computable general equilibrium model, they also found that the only positive impact holds for poverty reduction. Hence, they do not suggest pursuing this kind of fiscal policy.

In fact, however, there are no pure computable general equilibrium-based studies of government spending cut impact in Indonesia. Our approach is in the same spirit, although it has a significant difference. We employ computable general equilibrium model to access the impact of budget deficits reduction in the case of Indonesia. More specifically, using CGE EMERALD (Equilibrium Model with Economic Regional Analysis Dimensions) allows us to identify wide economic impacts either in the national, regional, or industrial levels. We test whether government spending cut offer a better precondition to achieve economic growth in the short-run and stabilization in the long-run.
3. Research Method

Computable general equilibrium models or applied general equilibrium (AGE) models are widely used to analyze the economy-wide impact of policies (see for instance: Vincent, 1989). In the case of Indonesia, we distinguish between static models (e.g. ORANI and INDORANI) and dynamic models (e.g. ORANI-F and MONASH). Dynamic models are developed from static models and contain dynamic elements, arising from stock/flow accumulation between capital stocks and investment, and between foreign debt and trade deficits.

We categorize computable general equilibrium models with a regional dimension as ‘top-down’ or ‘bottom-up’. A ‘top-down’ model is simple in theory and demands minimal regional data (Liew 1984). For this model, regional results are merely a decomposition of national results. By contrast, in a ‘bottom-up’ model each region is modeled independently. There is interaction between each regional and national agent and also among regional agents. A ‘bottom-up’ model has sophisticated theory and requires much regional data which is rarely available (Liew 1984).

A survey of computable general equilibrium models conducted by Partridge and Rickman (1998) excludes top-down models from their survey. This type of model, however, has been frequently used to decompose results from large-scale national computable general equilibrium models. In particular, the top-down model, ORES, has been effectively used in Australia to analyze the regional effects of national policy shocks and regional demand shocks. ORES models national economic activity, then allocates the economy-wide results among the states on the basis of relative regional output patterns and local multiplier effects.

While top-down models have the advantage of requiring only limited regional data (see Dixon et al. 1982), they are not equipped to model regional-specific shocks of the sort we examine in this paper. This problem can be partly overcome by constructing a hybrid ‘bottom-up’ and ‘top-down’ model, as demonstrated by Higgs et al. (1983) who constructed the ORANI-TAS-LMPST model to obtain regional projections of economic shocks. However, this approach still involves severe restrictions on regional analysis (Madden 1996) and as the ability to generate multiregional databases has improved, fully bottom-up modeling is more preferable.

The bottom-up computable general equilibrium models reviewed by Partridge and Rickman (1998) are generally small-scale and constructed for a specific application or class of applications. However, our aim is to use a general-purpose model of Indonesia with sufficient detail to analyze policies aimed at particular regional industry variables. An early Australian example of this sort of model was MRSMAE which explicitly modeled each economic agent in six Australian regions (Liew 1984).

Madden (1996) further developed large-scale multiregional computable general equilibrium modeling with FEDERAL, a two-region model of Australia. This model incorporated such elements as detailed modeling of two tiers of regional governments, regionally-sourced margins and interregional factor ownership. The two-region approach addressed the problem of data collection by estimating the larger region’s data flows as a residual from the national flows.

Recent years has seen the development of dynamic computable general equilibrium models (see, for instance, the models described in Harrison et al., 2000). Following development of the dynamic computable general equilibrium model of Australia, MONASH, by Dixon and Rimmer (2002), the two large-scale bottom-up models of Australia were also developed into dynamic models: FEDERAL-F (Giesecke, 2000) and MMRF-GREEN (Adams et al. 2000). Applications of FEDERAL-F can be seen for example in Giesecke and Madden (2003).

However, in this paper we use a multiregional model that includes a considerable number of regions (twenty-six) of Indonesia. Thus we make use of another new development in Australian multiregional modeling, TERM, which is a ‘bottom-up’ model that was constructed to overcome computational problems arising from a greater number of regions or sectors. This problem arises in modeling a country with a large number of provinces, such as Indonesia. An example of an application of TERM is an analysis of the 2002-2003 Australian droughts (Horridge et al. 2005). The structure of the TERM model is readily adaptable to the Indonesian economy.

Previous computable general equilibrium models of Indonesia such as INDORANI and INDOCEEM5 have used the ‘top-down’ approach to obtain regional results. Both models are static. The model that we employ in this study is a ‘bottom-up’ multiregional model of Indonesia known as EMERALD (Equilibrium Model with Economic Regional Analysis Dimensions, Pambudi 2005). We use a ‘bottom-up’ model because it allows us to simulate the effect of a specific event not only in a specific region but also in national level. This is because with a ‘bottom-up’ model each region has its own input-output interaction between each agent in the region, rather than simply having a share of the national results as with a ‘top-down’ model.
EMERALD recognizes three sets of regions: regions of use, of origin, and of origin of margins, i.e., the origins of margins services used to deliver a commodity from regions of origin. EMERALD assigns three different value flows: (a) basic values, or output prices for domestically-produced commodities and CIF prices for imports; (b) delivered values (=basic plus margins); and (c) purchasers’ values which equals delivered plus taxes. As a consequence, EMERALD produces price indices which distinguish between different points of sale by commodities and regions. Each region has its own set of supply, demand and trade matrices. This allows simulations of policies that have region-specific price effects.

The basic matrices resemble (for each region) a conventional single-region input-output database. The matrix of usage shows the delivered value of demand for each good whether domestic or imported in each destination region for each user (comprising the industries and 4 final demanders: households, investment, government, and exports). All these use values are ‘delivered’: they include the value of any trade or transport margins used to bring goods to the user. The data structure allows for re-export (at least in principle) and tax matrix of commodity tax revenues contains an element corresponding to each element of users. Together with matrices of primary factor cost and production taxes, these add up to the cost of production (or value of output) of each regional industry.

In principle, each industry is capable of producing any good. The production matrix shows the value of output of each commodity by each industry in each region. EMERALD recognizes inventory changes in a limited way. The changes in stocks of imports are ignored. For domestic output, stocks are unsold industry outputs. To produce used output, EMERALD assumes that all users of a given good in a given region have the same sourcing mix. For each flow there is a quantity and a price variable. In effect, for each good and region of use there is a broker who decides for all users in d from which source region, supplies will be obtained. We use the Armington (1969, 1970) sourcing assumption that the delivered output is a CES (constant elasticity of substitution) composite.

Using a CES nest, the quantity of goods from different regions to destination is proportional to the quantity of goods summed over region and to a price term powered by elasticity of substitution, between the source regions for each commodity. The price term is composed of relative price. Changes in the relative prices of commodity between regions induce substitution in favor of relatively cheapening goods. Because the delivered output is comprised of plus margin, we used them as a quantity variable for both delivered and trade output. The delivered prices variable is used for delivered price and basic prices for trade.

For many purposes it is useful to break down investment according to destination industry. The satellite investment matrix serves this purpose. It allows us to distinguish the commodity composition of investment according to industry; for example, we would expect investment in agriculture to use more machinery (and less construction) than investment in dwellings. Figure 1 visually summarizes the production nesting as the main framework of our empirical study.

Regional input-output tables and trade matrices are not available in Indonesia. The EMERALD database is produced from very limited regional data in several steps. Key features of this strategy are: (a) the process starts with a national input-output table and certain regional data. The minimum requirement for regional data is very modest: the distribution between regions of industry output and of final demand aggregates; (b) the database is constructed at the most disaggregated sectoral and regional. This is useful when estimating missing data.

In this paper, we try to employ the model to simulate the effect of a specific event in national level, i.e. increase in central government spending. We used GEMPACK (Harrison and Pearson, 1994) which is a flexible system for solving AGE models. The GEMPACK user creates a text file, listing the equations of the model. The syntax of this file resembles ordinary algebraic notation. The GEMPACK program TABLO then translates this text file into a model-specific program which solves the model.

EMERALD distinguishes between 19 sectors in each of 26 Indonesian provinces, employing data from INDOCEEM which are based on input-output tables for Indonesia in 2000 and then compiled in 2005. Social Accounting Matrix 2008 as also incorporated. INDOCEEM distinguishes 97 industries and 103 commodities. EMERALD aggregates the INDOCEEM data to 80 industries, each of which produces one commodity and uses regional value-added shares from the Indonesian Board of Statistics to split the user flows according to 26 destination provinces.

Using the gravity approach, EMERALD employs source shares to produce inter-provincial flows. This is because the necessary inter-regional flows data showing, for example, what share of interregional trade flows are rarely available. EMERALD employs the same elasticity as in INDORANI. The resulting database contains an input-output matrix for each province showing the values of Indonesian and imported goods used by each sector.
and by final consumers and a trade matrix showing inter-provincial flows of each domestic and imported good (for more details see Pambudi, 2005).

We used a long-run closure for this experiment within each region; labor is completely mobile among economic sectors. A wage differential is needed to induce labor movement among regions. It should be noted that we also allow the national employment to be endogenous. Rates of return are exogenous and capital for each regional industry is in elastic supply. The foreign currency prices of imports are naturally exogenous. Other exogenous variables include rates of production tax, technological coefficients, and price and quantity shift variables.

*Figure 1. EMERALD Production Nesting*
4. Results and Discussion

This section will present the results of CGE EMERALD model calculations under the scenario that there is a decrease 1 percent in government spending. The calculations are performed by release 10.0 GEMPACK computer program. The results will be divided into two categories. The first is for national level and the second one is for regional/provincial levels. Each analysis will be consecutively presented.

Table 1 presents the main macro-economic effects simulation at the national level. The decrease in government spending will lower the average real household consumption for about 0.07 percent. This suggests that public goods supplied by government spending and private goods are complementary as advocated by Keynesian paradigm. On the other hand, the decrease in government spending will induce real private investment for about 0.01 percent such that it drives up aggregate capital stock for about 0.02 percent. It thus shows that government spending especially for public investment and private investment are substitutes as proposed by Neo-Classical paradigm.

Those results demonstrate the phenomenon of partial crowding-out instead of complete crowding-out. The decrease in government purchases is followed by a decrease only in household spending but accompanied by an increase in private investment. However, the magnitude of the increase in private investment is lower than the decrease in household spending. Consequently, the impact on the real GDP is low. Overall, the decrease in real national income amounted to 0.008 percent. This result approximately equals to the findings of Kuncoro (2000).

<table>
<thead>
<tr>
<th>Main Macro Economic Variables</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Household Expenditure</td>
<td>-0.0717</td>
</tr>
<tr>
<td>Real Investment Expenditure</td>
<td>0.0139</td>
</tr>
<tr>
<td>Real Government Expenditure</td>
<td>-1.0000</td>
</tr>
<tr>
<td>Export Volume</td>
<td>0.1999</td>
</tr>
<tr>
<td>Import Volume Used</td>
<td>-0.1043</td>
</tr>
<tr>
<td>Import Landed</td>
<td>-0.1043</td>
</tr>
<tr>
<td>Real GDP</td>
<td>-0.0079</td>
</tr>
<tr>
<td>Aggregate Employment</td>
<td>-0.0535</td>
</tr>
<tr>
<td>Average Real Wage</td>
<td>-0.0535</td>
</tr>
<tr>
<td>Aggregate Capital Stock</td>
<td>0.0197</td>
</tr>
<tr>
<td>GDP Price Index</td>
<td>-0.0619</td>
</tr>
<tr>
<td>Consumer Price Index</td>
<td>-0.0510</td>
</tr>
<tr>
<td>Export Price Index</td>
<td>-0.0395</td>
</tr>
</tbody>
</table>

Source: own calculation

The low impact on the real gross domestic product is important to note. It means that that spending-based adjustments cause less contractionary effects as proposed by Alesina et al. (2012). In the same case, this also supports to Surjaningsih et al. (2012) compared to Basri and Rahardja (2011) that the change in expenditure policy is more effective to combat economic fluctuations than the change in revenue policy.

When the components of domestic absorption of goods and services are accompanied by foreign sector, the effect on exports is positive (0.2 percent). The effect of increase in government spending on the import is in the opposite direction (-0.1 percent). These results show the existence of twin deficits i.e. the budget deficit as a result of spending decrease will be associated with the low current account deficit. This common figure found in many Asian developing countries (Gupta, 1992; Hur et al., 2010).
The decrease in national income induced by the lower government spending in one hand marginally discourages aggregate employment opportunities and wage rates for about -0.05 percent on the average. On the other hand, it also depresses the inflation rate. The decrease in inflation measured by the GDP deflator, CPI, and the export price index are -0.06, -0.05, and -0.04 percent respectively. The findings are in line with Okun’s law (a relationship between economic growth and employment) and Phillips curve (a relationship between inflation and unemployment).

Table 2 furthermore reports more detail the simulation results for industrial distribution of output and employment. In general, a decline in government spending will not reduce entirely sectoral output. Fortunately, the lower industrial output occurs in the non-tradable sectors primarily the government services themselves which have the highest impacted (-0.62 percent). Most tradable sectors have a positive impact suggesting that the decrease in government spending seems to be conducive for industrial economy.

**Table 2. Impacts of Central Government Expenditure Reduction on Industrial Output and Employment**

<table>
<thead>
<tr>
<th>Economic Sectors</th>
<th>Output (%)</th>
<th>Employment (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0.0096</td>
<td>0.0303</td>
</tr>
<tr>
<td>Fishing</td>
<td>0.0021</td>
<td>0.0201</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>0.0483</td>
<td>0.0899</td>
</tr>
<tr>
<td>Mining</td>
<td>0.0758</td>
<td>0.1107</td>
</tr>
<tr>
<td>Food and Drink</td>
<td>0.0134</td>
<td>0.0352</td>
</tr>
<tr>
<td>TCF</td>
<td>0.1298</td>
<td>0.1477</td>
</tr>
<tr>
<td>Wood and Paper</td>
<td>0.0657</td>
<td>0.0856</td>
</tr>
<tr>
<td>Chemicals</td>
<td>0.0808</td>
<td>0.1030</td>
</tr>
<tr>
<td>LNG</td>
<td>0.1082</td>
<td>0.1036</td>
</tr>
<tr>
<td>Basic Metal</td>
<td>0.0777</td>
<td>0.1000</td>
</tr>
<tr>
<td>Machine and Electronics</td>
<td>0.1390</td>
<td>0.1573</td>
</tr>
<tr>
<td>Other Manufacture</td>
<td>0.0571</td>
<td>0.0767</td>
</tr>
<tr>
<td>Electricity, Gas, and Water</td>
<td>-0.0535</td>
<td>-0.0351</td>
</tr>
<tr>
<td>Construction</td>
<td>-0.0314</td>
<td>-0.0172</td>
</tr>
<tr>
<td>Trade</td>
<td>0.0233</td>
<td>0.0396</td>
</tr>
<tr>
<td>Hotel and Restaurant</td>
<td>-0.0463</td>
<td>-0.0354</td>
</tr>
<tr>
<td>Transportation</td>
<td>0.0194</td>
<td>0.0436</td>
</tr>
<tr>
<td>Other Services</td>
<td>-0.0810</td>
<td>-0.0642</td>
</tr>
<tr>
<td>Government Services</td>
<td>-0.6247</td>
<td>-0.6230</td>
</tr>
</tbody>
</table>

**Source:** own calculation

The largest impact of 1 percent decrease in government spending on the employment is the machine and electronics as well as textiles, clothing, and footwear (TCF). The employment in each sub-industry is promoted by 0.16 and 0.15 percent respectively. Both sectors are characterized by labor-intensive technology, so that the decrease in government purchases (that have a positive impact on the private investment) tends to induce employment opportunities in a substantial percentage.

The smallest impact of the changes in employment received is fisheries (0.02 percent), agriculture (0.03 percent), and food and drink (0.04 percent). These results, in their own limitations, are reasonable. The
agricultural sector is still absorbing the large amount of labor both in absolute and relative terms and characterized by labor-intensive, so the decrease in government spending does not largely induce the employment opportunities in the corresponding economic sectors.

It is also notable that sub-sectors which suffer decrease in the employment opportunities are consistent with the configuration of sectoral decrease in output. Those prove the existence of the concept of derived demand. Theoretically, the demand for labor is derived from the prospect of output growth. The higher output growth, the larger labor to be hired is, and vice versa. Nevertheless, overall in the case of Indonesia, the concept of derived demand is relatively low (i.e. inelastic).

The best possible interpretation to explain the condition of disharmony among the sectoral output growth above is the existence of weak industrial backward and forward linkages within the structure of Indonesian economy. The output of electricity, water, and gas, construction, hotels and restaurants, and government services sectors actually are non-tradable. Consequently, the effects triggered by the increase in output of these sectors are not able to raise the output in other sectors significantly. These results confirm to the findings of Ardani (1992) study.

Beside to foster economic growth, the other important objective of fiscal policy is an instrument to equalize regional income distribution. This objective can be pursued effectively through creating the productive and remunerative employment opportunities across region. Figure 2 breaks down the impact of 1 percent decrease in government expenditures on provincial output and employment.

In terms of economic growth (real GDP), East Nusa Tenggara province suffers -0.08 percent decrease in economic activity. The next worst rank is North Sulawesi (-0.077 percent), South East Sulawesi, and West Sumatera provinces which grew by -0.071 percent respectively. In contrast, some provinces that experienced the largest incline in economic growth are East Kalimantan (0.05 percent) and Riau (0.02 percent).

It seems that the relatively less developed regions (East Nusa Tenggara, North Sulawesi, and South East Sulawesi provinces) which they rely heavily on the government sector as an engine of development, the impact of government economic activity to be identified are very high. Conversely, some natural resources-rich provinces (East Kalimantan and Riau) accompanied with dominant private sector, the impact of government economic activity to be identified is very low.

In term of labor employment, the simulations show the impact of 1 percent decrease in government spending in general will lead to contraction of job opportunities with an exception occurs for East Kalimantan province only. In the corresponding province, the impact of decrease in government expenditures on job creation is positive (0.02 percent). Given the abundant natural resources, the job creation associated with the government spending fall takes places probably in extractive and related economic sectors.

In addition, the job creation decrease highly varies across province. South East Sulawesi, East Nusa Tenggara, North Sulawesi, and West Sumatera provinces, for example, experience job opportunity decrease for about -0.16, -0.15, and -0.14 percent respectively. It seems that the output and employment growth dynamics across province is closely related. However, the magnitude of provincial employment decrease is generally higher than that of output growth. Those imply the existence of the less productive employment. We predict that the existence of informal employment may be a source of this phenomenon.
Examined more deeply, the impact of decrease in government spending on provincial growth of investment in each province presents the same pattern with the provincial growth of real GDP. Figure 3 maps the regional investment made in each province as response to a fall in central government spending. The decrease in investment growth occurs only in 7 provinces, that is West Sumatera, Lampung, Jakarta, Yogyakarta, Central Kalimantan, North Sulawesi, and East Nusa Tenggara.

The unequal impact on investment may relate to the fragility of both backward and forward linkages across region. Within this circumstance, the multiplier effect of investment activity in one region works in own region so that less able to be a trigger for investment in the surrounding areas. In a regional economic perspective, the investment in one economic sector in certain region will generate spillover effect to the nearby geographical areas so that those regions can grow together.

When we break down the investment growth further into industry, the pattern remains similar with output and employment growth. Electricity, water, and gas, construction, hotel and restaurant, other services, and government sector employment decreased in all provinces. Thus, the regional macro-economic policy to stimulate output growth and to attract investment is the most appropriate alternative solutions to create employment opportunities. If those policies can be realized, they support to the idea of growth with equity.

Figure 3 also presents provincial household expenditures. It is clear to infer that there is partial crowding-out effect. The decrease in government expenditure (i.e. lower deficit) drives down the regional household consumption expenditure deeper and promotes the provincial private investment expenditure. Again, an exception is applied for 7 provinces as identified previously. In those localities, there is crowding-in effect; private consumption and investment expenditures increase together.

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1 We do not report the simulation results of industrial sector for each province because of lack of space. They are available on request.
Figure 3. Impact of Government Spending Cut on Regional Household Consumption and Investment

Figure 4 highlights the impact of decrease in government spending on the regional export and import volumes. In general, the effect of reducing deficit policy is positive for export and otherwise for import. The results are consistent for the whole provinces. Even though the magnitude is relatively very small, it becomes a significant impact on the second round in terms of term of trade, exchange rate, and current account improvements.

More detail, in the case of export, Maluku and East Nusa Tenggara provinces are two regions which have the heaviest incline in export. Similarly, the two provinces also experience having the highest decrease in import. Likewise, Riau and East Kalimantan provinces are two regions with the lowest impact both export and import. Those imply that the later two regions whose abundant natural resources tend to have a leading sector so the change in government activity does not alter regional economy significantly.

Based on the industrial sector, the primary sectors, such agriculture and fisheries, increase in its export capacity occurs in most provinces in Indonesia. In the secondary sector, only electricity, water, and gas and construction increase its export capacity in most regions. In the tertiary sector, hotel and restaurant, other services, and the government sector have increased its exports in all regions. In short, we can infer that the configuration impact of industrial economy is better than the regional outcome.

The relatively high increase in export capacity for the agricultural sector is an interesting result. This condition is supported by the fact that most Indonesian people works in the agricultural sector. This means that agriculture and fisheries sector have considerable potential to support economy, employment, and balance of payment equilibrium. On the other hand, the increase in export capacity at the secondary and tertiary sectors is not potential due to non-tradable.
Fiscal policy, eventually, is directed to be an instrument of stabilization and redistribution. The economic stabilization is commonly measured by consumer price index. Figure 5 displays the configuration of the relative change in CPI across province. The decrease in central government budget deficit induced by government spending cut tends to decline CPI in all provinces. The highest impact takes places in North Sulawesi (-0.068 percent) and West Sumatera (-0.066 percent) respectively.

By contrast, East Kalimantan, Aceh, and Bali provinces have the lowest impact on the inflation rate (for about 0.04 percent). The three regions typically have a specific leading sector, i.e. natural gas and tourism. Accordingly, the decrease in aggregate demand driven by lower government expenditure could be absorbed by the increase in regional income generated by their leading sector. In such a case, the inflation rate could be moderately neutralized.

That analysis above still holds when we extend to the export price index. The change in export price index in most regions is lower than the change in CPI. However, the distribution of CPI across province is similar with that of real GDP and the distribution of export price index across province is rather closely related with that of export volume in the corresponding region. The high inflation rate causes the increase in export price index. When the export price index is high, the export volume is declining leading to the decrease in the regional term of trade. As a result, the national competitiveness becomes weaker.

It is also noticeable that the pattern of change in CPI as well as export price index distribution across province seems closely related to that of employment. In short, the control of inflation rate could be a key answer to minimize the negative impact of budget deficit policy in order to improve regional growth and income distribution. This is consistent with Snyder’s (1985) finding in the context of national level. In such a case, the regional income convergence will be achieved in the long-term.
5. Concluding Remarks

This paper assessed the economic impact of reducing budget deficits in the case of Indonesia using CGE EMERALD model. The simulation in domestic goods market shows that 1 percent decreases in government expenditures has positively impacts on real investment expenditures and as well as aggregate capital stock. The negative impact occurs in real household expenditures. In addition, the decrease in government expenditures induces import volume lower than that of export. Consequently, the overall impact of lower deficit marginally reduces economic growth.

Regarding other macroeconomic variables, it declines the inflation rate for about 0.05 percent. In relation to employment, the negative impact is marginally only on the non-tradable sectors. As a result, the average wage level does not decrease significantly in other economic sectors. The similar results present in the regional levels. Those findings imply that not all government expenditures are beneficial in nature. Furthermore, they perform the feasibility of government policy to conduct balance budget as well as counter-cyclical policies in the future not only to maintain economic growth in general but also balance of payment and fiscal sustainability in particular.

The analysis reported here is in the static frame-works and focused only on the real sectors. The economic impact of budget deficit in the case of Indonesia is interesting to be explored further. Ideally, the analysis of budget deficit impact should capture goods, labor, foreign, and money markets. Even though monetary financing is by the law forbidden in Indonesia, the advanced CGE model might incorporate financial sector in the dynamic frameworks to accommodate divestment conducted by state-owned companies to finance deficit. Future research direction should be to construct models that grasp the reality and flexible enough to include all relevant variables to empirically test the three hypotheses.

References


