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The impact of government consumption on the private expenditures in developing country: the case of Indonesia

Haryo Kuncoro

Faculty of Economics, State University of Jakarta, Indonesia

corresponding e-mail: har_kun[at]feunj(dot)ac{dot}id

address: Rawamangun Muka, Jakarta Timur 13220

Abstract: The relationship between government actions and private reactions is an important subject of continuing discussion in fiscal policy. This paper provides empirical evidence on the impact of government consumption on private expenditures in the case of Indonesia over the period of 1990–2012. We use Almost Ideal Demand System (AIDS) model to analyze the quarterly data of household consumption, investment, government spending, and import in compliance with the national income product based on expenditure approach. The results confirm that the government expenditure crowds-out household consumption. In contrast, it crowds-in firm investment and import. The elasticity of government expenditure with respect to income is the lowest while that of investment is the highest. Those findings suggest that the public sector is decreasing in relative importance gradually taken over by private sector to promote economic growth. As the economy grows, the economic policies of governments should have a tendency to more heavily focus on economic stabilization especially in relation to external imbalance induced by tendency of increase in import.

JEL Classifications: C32, H50, E62

Keywords: Government consumption, private expenditures, crowding-out effect, price elasticity, income elasticity

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1. Introduction

The importance of government expenditure has been received much attention by academicians and policy makers in the last decade (see for example: IMF, 2008). Government expenditure and the impacts of its growth are serious concerns in many countries. The main question is whether the increase in government spending in the form of fiscal stimuli is really effective to stabilize macroeconomic condition in particular during global financial crisis in the late of 2008.

For academicians, the controversy arises between Keynesian and classical school of thoughts. Keynesian thought traditionally, in one hand, emphasizes an active role in fiscal policy for economic stability throughout aggregate demand management. On the other hand, classical economists have negative views of fiscal stabilizing policy regarding the Ricardian equivalence or even crowding-out effect (Romer, 2012). Despite the emergence of a large body of literature, as we shall see later, surprisingly very little is known about the effects of fiscal policy on economic activity and on the short- versus long-run destabilizing behavior of fiscal policy in emerging market countries.

For policy makers, fiscal policy is actually 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 authorities for controlling business cycles by fiscal policies. 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 (Christiano, Eichenbaum, & Rebelo, 2011). Hence, the second issue is how the optimal fiscal policy should be conducted. While in advanced countries private sector led economic growth, in developing countries, by and large, government dominates the economy.

With regard to its economic impact on private sector, it is necessary to identify whether fiscal policy can effectively offer a better precondition to achieve economic growth in the short- run and stabilization in the long- run. Knowing responsiveness of the private sector's economic activity toward government expenditure is crucial. Basically, if the responsiveness is positively high, fiscal policy has large effects on the real economy; it means that expansionary spending is an efficient way to boost the economy. In contrast, if the private responsiveness is negatively large, the government spending would be ineffective or even adverse to the economy.

Indonesia provides a unique opportunity to assess the nature of government spending. After launching deregulation and de-bureaucratization in all economic aspects in mid-1980s, private sector led economic growth. As a result, Indonesia became a new industrialized country (Hill, 2000). However, Asian financial crisis in 1997/98 has directed government expenditures to focus on the economic recovery. More than a hundred trillion Rupiah was allocated to restructure the financial intermediations.

Furthermore, the global financial crisis in 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). 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 & Resosudarmo, 2017). Therefore, lessons from Indonesia will be useful to develop a better adjustment policy design.

Beyond the crisis, nevertheless, one of the key structural challenges facing developing Asia (including Indonesia) is the need for rebalancing away from excessive dependence on external demand (Hur, Mallick, & Park, 2010). Toward a more balanced demand structure that accords a bigger role for domestic demand, the government may have to provide more demand during the transition period. The primary role of fiscal policy in the rebalancing process is to help remove the structural impediments and distortions constraining private consumption and investment. This brings us back to the third issue of crowding-out effect.

This paper enriches the literature on fiscal policy in relation to private sector in developing countries with focus on Indonesia. The motivation for this approach associates to the fact that the size of government in the country is relatively small, thus the scope for actively promoting economic growth remains limited. Therefore, fiscal policy in the rebalancing process is likely to require an increase in the size of the private spending. The article is organized as follows. In the next section, we briefly present the literature and previous empirical researches both in developed countries and developing countries including Indonesia. The third section describes the dataset and empirical techniques used. Then, we present the main results of the empirical study. In the end, we conclude with a summary of key findings.

2. Literature review

The idea of Adam Smith (1776) about the 'specialization' implicitly proposes the substitutive function of government expenditure in relation to private spending. In line with Smith, David & Scadding (1974) formalized the relationship between government and private expenditures in the frame of ultra-rationality notion. Ultra-rationality of

households considers that the corporate and government sectors are extensions of households, so that government expenditures are viewed as substitutes for private expenditures.

Keynesian analysis justifies government intervention in the economy on the basis of market failures. Keynesian economics argues that private sector decisions sometimes lead to inefficient macroeconomic outcomes and therefore, advocates active policy responses by the public sector. It means that government expenditure will be complement instead of substitute for private spending.

Ricardian equivalence (Barro, 1974) proposed that government expenditure has a neutral impact on the private sectors. For him, successive generations are linked through voluntary, altruistically motivated resources transfer (Bernheim, 1989). Therefore, the increase in government expenditure in the current period can be viewed as an increase in tax in the future, so that the private sectors respond in which the present value of expenditure equals to the deferred tax liabilities.

Theoretically, the crowding-out phenomenon refers to the substitutability of government expenditure. Crowding-out is said to exist when the increase in government spending is accompanied by a reduction in the private expenditure. When the discussion of crowding-out is concentrated on how the government finances her expenditure, it is recognized as 'financial crowding-out'. However, when attention is directed to the size and share of public expenditure, this is 'resource crowding-out' (Arestis, 1985).

Regarding to the 'financial crowding-out', when the government runs an excessive spending (budget deficit), funds will need to come from public borrowing (the issue of government bonds), overseas borrowing, or monetizing the debt. When governments fund a deficit with the issuing of government bonds, interest rates can increase across the market, because government borrowing creates higher demand for credit in the financial markets.

Some also believe that expansionary fiscal policy also decreases net exports. When government borrowing increases interest rates it attracts foreign capital from foreign investors. This is because, all other things being equal, the bonds issued from a country executing expansionary fiscal policy now offer a higher rate of return. In other words, companies wanting to finance projects must compete with their government for capital so they offer higher rates of return.

To purchase bonds originating from a certain country, foreign investors must obtain that country's currency. Therefore, when foreign capital flows into the country undergoing fiscal expansion, demand for that country's currency increases. The increased demand causes that country's currency to appreciate. Once the currency appreciates, goods originating from that country now cost more to foreigners than they did before and foreign goods now cost less than they did before. Consequently, exports decrease and imports increase.

With regard to the 'resource crowding-out', the empirical relationship between private and public spending goes back as early as Bailey (1971) and Buiter (1977). These two studies were mainly concerned with the crowding-out effect of public expenditure and the degree of substitutability and complementarity relationship between private and public spending. Barro (1981) is the first one who suggests incorporating government consumption into the representative agent decision problem, making the public sector is a part of the general equilibrium system.

Kormendi (1983) employed the permanent income approach and found a significant degree of substitutability between private consumption and government spending for the US. Aschauer (1985) used Euler equation to estimate the effects of budget deficit on private consumption and found that a budget deficit tends to crowd-out private consumption. Ahmed (1986) used an inter-temporal substitution model to estimate the

effects of government consumption using UK data. He got that government consumption tends to crowd-out private consumption.

Aiyagari, Lawrence, Christiano, & Eichenbaum (1992) and Baxter & King (1993) explored the effect of government spending shocks on various economic aggregates in a one-sector neoclassical growth model with constant returns to scale and variable labor supply. They found that an increase in government spending significantly leads to a decline in private consumption. Amino & Wirjanto (1997) applied a relative price approach to estimate the intra-temporal elasticity of substitution between government spending and private consumption in the US.

Incorporating government spending in the standard macro investment model was first undertaken by Aschauer (1989). His analysis is based on the neoclassical model to estimate the separate effects of various categories of government expenditure on private investment. Easterly & Rebelo (1993) found a negative correlation between budget deficits and private investment in a large cross section of 125 countries. Furceri & Sousa (2011) found that government spending produces important crowding-out effects, by negatively affecting both private consumption and investment in panel of 145 countries from 1960 to 2007.

In line with the recent development in econometric methods, Blanchard & Perotti (2002) used information about the elasticity of fiscal variables to identify the automatic response of fiscal policy, and found that expansionary fiscal shocks increase output, have a positive effect on private consumption, and a negative impact on private investment. Fatás & Mihov (2001) used a Cholesky ordering to identify fiscal shocks and showed that increases in government expenditures are expansionary, but lead to an increase in private investment that more than compensates for the fall in private consumption. Perotti (2004) investigated the effects of fiscal policy in Australia, Canada, Germany, and the UK, and found a relatively large positive effect on private consumption but no response of private investment.

However, there are mixed evidences of crowding-out and crowding-in effect of public investment in developing countries (Atukeren, 2005). Empirical evidences have shown that for the developed and developing economies, the effect may be opposite (Erden & Holcombe, 2005; Gjini & Kukeli, 2012). Mitra (2006) has investigated the crowding-out effect in India, through the analysis of movements of government investment, private investment, and GDP in a SVAR model. The empirical results suggested that government investment has been crowding-out private investment, even though government investment had a positive impact on the economy in the long-run.

Ramey (2011) advanced the issue by questioning whether government spending raises or lowers consumption and the real wage and how government spending affects GDP and hours. According to her, a permanent increase in government spending financed by non-distortionary means creates a negative wealth effect for the representative household. The household optimally responds by decreasing its consumption and increasing its labor supply. A temporary increase in government spending has less impact on output because of the smaller wealth effect. Depending on the persistence of the shock, investment can rise or fall. In the short-run, hours should still rise and consumption should still fall.

Those studies reveal that it is not clear why either substitutability or complementarity would best describe the relationship between private consumption, investment, and government spending. Vegari (1988) tested crowding-out effect simultaneously in the US and found that government activities do not crowd-out private activities. Gupta's (1992) study of 9 Asian countries suggested that crowding-out is very partial. Modifying Vegari's model, Santoso (1992) observed that the government activity do not wholly crowd-out in 11 Asian countries including Indonesia. In the case of Indonesia, Kuncoro (2000) analyzed the impact of excessive government spending on household consumption and private investment and found partial crowding-out effect. Kwan (2007) obtained that private and government consumption are strong complements.

Most of other works in Indonesia has been conducted separately in particular concentrated on the inflation rate (Snyder, 1985), private investment (Ikhsan & Basri, 1991), private consumption (Adji, 1995), current account (Adji, 1998), exchange rate (Abimanyu, 1998), tax revenue (Saleh, 2002), and interest rates (Adiningsih, 2009). In fact, there are mixed evidences of crowding-out and crowding-in effect. Recently, in accordance with global financial crisis, Simorangkir & Adamanti (2010) analyzed the impact of fiscal stimulus; Basri & Rahardja (2011) and Doraisami (2013) assessed the fiscal position; and Surjaningsih, Utari, & Trisnanto (2012) observed output and prices volatility. Those results in general found the positive impact of fiscal expansion. Therefore, they refute the supposed fears about massive crowding-out and clearly establish the role of an activist fiscal policy in that country.

3. Research method

Empirics and literature in this issue explained above is quite inconclusive, it finds empirically that crowding-out effect is present in the economy at times or the opposite at some other times. This could be due to empirical methods employed, lack of computability power of data (especially in earlier studies when computability power was not at all near to what we have today), modeling and specification issues, or due to structural make up of national economies (Gjini & Kukeli, 2012).

As noted before, crowding-out is essentially the reaction of private expenditure to government spending. Unfortunately, those studies have not taken into account foreign sector in the comprehensive method. This paper contributes to the literature by modifying approach used by Vegari (1988), Santoso (1992), and Kuncoro (2000) to enable incorporate the foreign sector. We assume that exports are exogenous and imports are endogenous variable. Therefore, a more comprehensive study of a fully simultaneous model is necessary in order to fully determine whether government expenditure will crowd-out or crowd-in household consumption, investment, and import take place in Indonesia.

As explained in the conventional theory of demand, two goods vis-à-vis can be viewed as substitution, complement, and independent. The substitutability between government spending and private expenditures refers to neo-classical paradigm; the complementary between government spending and private expenditures refers to the Keynesian school of thought; and the independence between government spending and private expenditures refers to the Ricardian view. In short, the crowding-out (-in) effects is more empirical rather than theoretical matters (Seater, 1993).

It seems more appropriate to analyze these variables directly. However, estimation of single demand function creates the problem that the quantity projections obtained may not satisfy the requirements of demand theory, particularly the budget constraint. For this purpose, complete systems of demand equations which are able to take into account consistently the mutual interdependence of large number of commodities in the choice made by consumers need to be specified and estimated.

Three demand systems have received considerable attention because of their relative empirical expediency. They are the Linear Expenditure System (LES) developed by Stone (1954), the Almost Ideal Demand System (AIDS) developed by Deaton & Muellbauer (1980), and the combination of these two systems into a Generalized Almost Ideal Demand System (GAIDS) proposed by Bollino & Violi (1990). Other complete demand systems found in the literature but not as widely used are Rotterdam model of Theil (1976) and Barten (1969) and the transcendental logarithmic model of Christensen, Jorgenson, & Lau (1975).

Here, we prefer using AIDS model as employed by Kuncoro (2000). The AIDS derives from a utility function specified as a second-order approximation to any utility function

(Deaton & Muellbauer, 1980; Sadoulet & de Janvry, 1995). The demand functions are derived in budget share as:

$$\frac{p_i q_i}{Y} = s_i = a_0^* + \sum_j b_{ij} \ln p_j + c_i \ln \left(\frac{Y}{P}\right) \quad (1)$$

where s_i is budget share, P is a price index defined as:

$$\ln P = a_0 + \sum_k a_k \ln p_k + \frac{1}{2} \sum_j \sum_k b_{jk} \ln p_k \ln p_j \quad (2)$$

and the parameters are subject to the following restrictions:

$$\Sigma a_i = 1; \quad \Sigma b_{ij} = \Sigma b_{ji} = 0; \quad \Sigma c_i = 0$$

Deaton & Muellbauer (1980) suggest approximating the price index P by the Stone geometric price index:

$$\ln P^* = \sum_i s_i \ln p_i \quad (3)$$

This linear approximation is all the better if there is collinearity in prices over time. The equation to be estimates is thus:

$$s_i = a_i^* + \sum_j b_{ij} \ln p_j + c_i \ln \left(\frac{Y}{P^*}\right) \quad (4)$$

where $a_i^* = a_i - c_i \ln \phi$ and $P = \phi P^*$ is the approximation to P .

The linear-approximate AIDS should be estimated as a system of equations with the above-mentioned restrictions on the parameter estimates. The price and income elasticities can be derived from the parameter estimates as:

$$E_{ii} = -1 + \frac{b_{ij}}{s_i} - c_i \quad (5)$$

$$E_{ij} = \frac{b_{ij}}{s_i} - \frac{c_i}{s_i} s_j \quad (6)$$

$$\eta_{iY} = 1 + \frac{c_i}{s_i} \quad (7)$$

The AIDS implies a money flexibility value of minus one (Blanciforti, Green, & King, 1986).

The commodities q_i in the AIDS model will be applied on household consumption (CS), private investment (I), government consumption (G), and import (M). Each demand equations appear to be unrelated since none of the endogenous quantities or budget shares appear on the right-hand side of the equations. This is not the case; however, since error terms across equations are correlated by the fact that the dependent variables need satisfy the budget constraint (e.g., the budget shares sum to one).

While an OLS estimate of these equations would be consistent and unbiased, the estimation method developed by Zellner (1962) for Seemingly Unrelated Regressions Estimation (SURE) provides estimates that are more efficient. In a first stage, OLS is used to estimate the variance-covariance matrix among residuals; in a second stage this estimated matrix is used in generalized least squares estimation. Since the covariance matrix among residuals is singular (because the residuals satisfy the budget constraint), the typical procedure consists in deleting one of the equations of the demand system.

The parameters from the deleted equation can be calculated from the parameters of the other equations through the restrictions on parameters. In general, the result of SURE will be equivalent with the maximum likelihood estimators (Greene, 2012). To obtain a symmetric and homogenous equation system, the estimation will be done directly on shares of household consumption, private investment, and government expenditure, while share of import will be done indirectly.

As LES model, AIDS could be applied to large categories of expenditure than individual commodities. It does not require the detail data, something that are difficult to find in developing countries. Therefore, AIDS model is appropriately implemented on the aggregated data which are publicly available for public consumption. Based on the estimation results of AIDS, we can construct the following criteria:

- Neo-classical proposition exists, that is resources crowding-out, when $E_{CG} < 0$, $E_{IG} < 0$, and $E_{MG} < 0$, i.e. government expenditure crowds out each component of private expenditures.
- Keynesian proposition holds, that is resources crowding-in, when $E_{CG} > 0$, $E_{IG} > 0$, and $E_{MG} > 0$, i.e. government expenditure induces each component of private expenditures.
- Ricardian equivalence paradigm occurs, that is government expenditure is neutral to each component of private expenditures if $E_{CG} = 0$, $E_{IG} = 0$, and $E_{MG} = 0$.

Since we concern with degree of substitutability and/or complementarity, we need the reliable and long span time series data on consumption, investment, government expenditure, import, and GDP. The GDP data are available in quarter basis. Unfortunately, the quarterly data of government budget of public investment are publicly unavailable. According to Abdurrohman & Resosudarmo (2017), data on monthly cash

disbursement of functional government budget has never been released by Ministry of Finance to the public.

In addition, the quality of government investment expenditure interpolated from annual data into quarterly data that was used by some researchers is quite questionable. Regarding to the limitation, we analyzed quarterly data only on government consumption expenditure derived from the national income and product account based on expenditure approach standard. This is intended that our study will be comparable to similar studies in other countries.

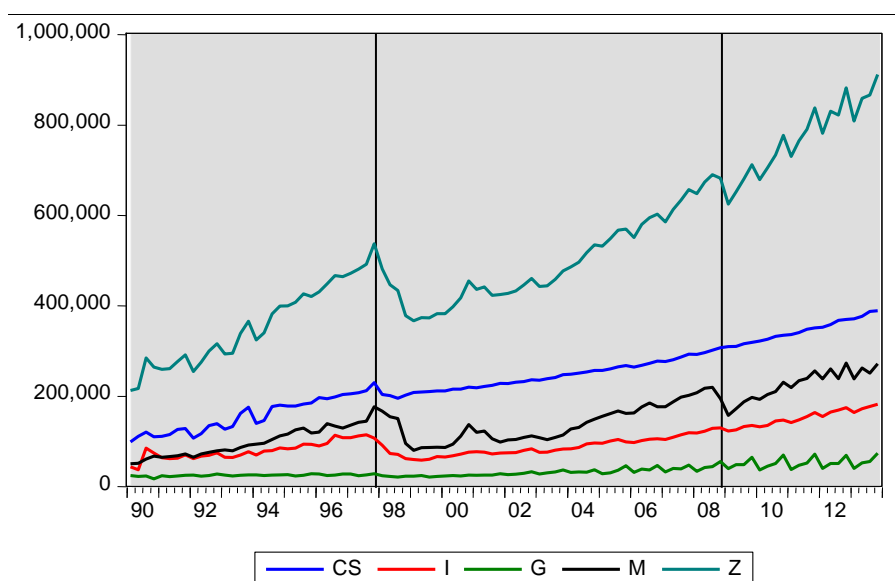
The sample periods chosen for this study extend from 1990(1) to 2012(4). The total observation is 92 sample points. The term government expenditure used in this study is central government general consumption or recurrent expenditure realization (mostly allocated onto wage/salary and goods/services purchases) excluding interest payment of government debts. The recurrent expenditure dominates (almost 90 percent) to the capital expenditure of the total government spending. Therefore, the earlier one is representative for analyzing fiscal policy.

The private expenditures and government spending and income are presented in 2000 constant price. The deflator is then used as general price (PZ). The prices of expenditure (PC, PI, PG, and PM) are obtained by dividing the expenditure in current price by the expenditure in constant price. All of the data are taken from the central bank of Indonesia (www.bi.go.id) and Central Board of Statistics (www.bps.go.id). Most of the results are calculated in econometric program Eviews 8.

4. Empirical results

Figure 1 delivers the movement of four expenditures of interest for the whole period. The contour of investment and import expenditures slightly dropped in 1997/98 as a consequence of Asian financial crisis. As a result, the total expenditure was also decrease in the corresponding periods. Meanwhile, the household and government consumption were relatively stable. In this point, we preliminary can infer that household and government consumption are less sensitive to the economic condition.

FIGURE 1. PLOT OF CS, I, G, M, AND Z



Compared to global financial crisis in 2008, there is a significant difference. The import was the only expenditure that reduced in that time. In contrast, other variables remained stable or even increased in particular household consumption and investment expenditures. Overall, the total expenditure increased even though rather seasonally fluctuated. Given this, we can say that imports are more responsive than investment to the economic fluctuations.

FIGURE 2. PLOT OF PC, PI, PG, PM, AND PZ

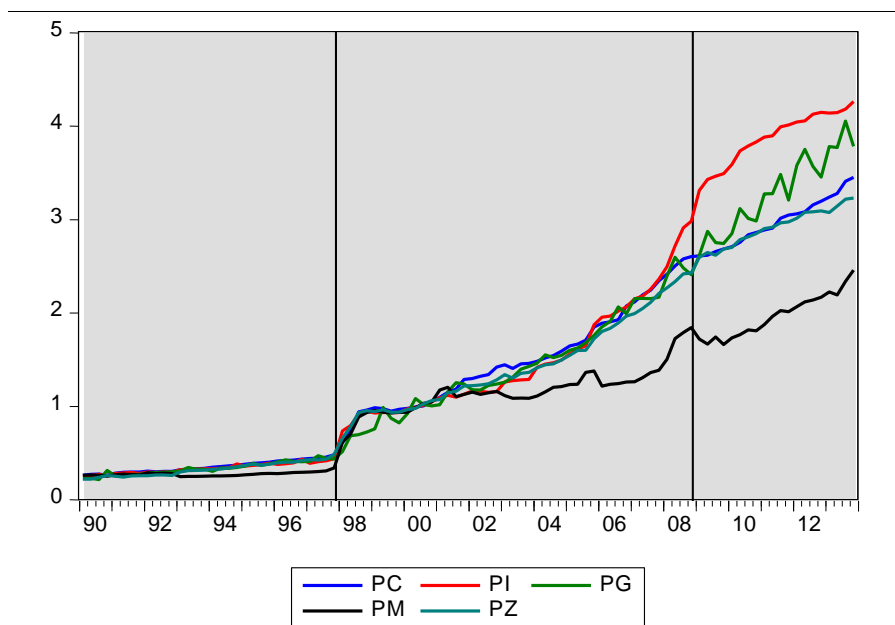


Figure 2 presents the four price deflators of interest. Except the import price, there was a tendency to increase. The increases in price were higher both in 1997/98 and 2008. It is noticeable that the price of investment was the highest rate of growth. Conversely, the price of import tended to increase slowly. From the visual inspection on Figure 1 and 2, overall it seems that the conventional theory of demand holds for all expenditures. We will check it again empirically later.

Table 1 presents the elementary statistics covering mean, median, and extreme (maximum and minimum) values. The average value of household consumption is the highest (228 trillion Rupiah) followed by import (137 trillion Rupiah). Hence, the share of household consumption reaches 46.54 percent of the total expenditure. Conversely, government consumption is the lowest both in absolute (31 trillion Rupiah) and relative (6.35 percent) terms. The high private consumption relative to other expenditure components is the common figure in developing countries (Romer, 2012).

The median values household consumption and import are close enough to the respective mean. The similar pattern occurs in price of private consumption and price of total expenditure. Those preliminary indicate that private consumption and total income and their respective prices are normally distributed. Jarque-Bera tests confirm that those variables are symmetrically distributed (bell-shaped) indicated by probability value higher than 1 percent. In other words, the null hypotheses that the series data is normally

distributed can be rejected in 99 percent confidence level with an exception holds for G, PI, and PG.

The asymmetric distribution of government consumption is confirmed by the highest value of skewness. The upper tail of the distribution is thicker than the lower tail (indicated by the positive value of skewness. Again, the government consumption expenditure has the greatest value of kurtosis. It implies that the tails of the distribution are thicker than the normal (indicated by the kurtosis coefficient greater than 3). The tails of the distribution are moderate indicated by the kurtosis coefficient less than 3. This raises a logical question of whether (regarding to the lowest share) government expenditure can induce the overall private spending.

TABLE 1. DESCRIPTIVE STATISTICS

	CS	I	G	M	Z	PC	PI	PG	PM	PZ
Share (%)	46.54	19.12	6.35	28.00	100.00	-	-	-	-	-
Mean	228,802	94,000	31,204	137,667	491,673	1.3423	1.4893	1.3548	0.8694	1.2663
Median	224,449	84,438	26,283	127,737	455,043	1.1587	1.1011	1.1576	1.0317	1.1489
Maximum	368,213	173,895	69,998	271,746	881,517	3.1894	4.1960	3.7407	1.6495	3.0902
Minimum	97,220	35,594	15,544	48,895	211,283	0.2548	0.2442	0.2088	0.1550	0.2487
Std. Dev.	70,707	30,482	11,804	55,105	161,623	0.9568	1.2641	1.0512	0.5126	0.9122
CV (%)	30.90	32.43	37.83	40.03	32.87	71.28	84.88	77.59	58.97	72.04
Skewness	0.0446	0.7401	1.4871	0.4818	0.4713	0.4698	0.9028	0.7005	-0.1974	0.5415
Kurtosis	2.2380	2.8567	4.7837	2.3185	2.4512	1.8563	2.4865	2.2575	1.5431	2.0283
Jarque-Bera	2.2561	8.4781	46.1047	5.3398	4.5601	8.3984	13.5076	9.6383	8.7335	8.1148
Probability	0.3237	0.0144	0.0000	0.0693	0.1023	0.0150	0.0012	0.0081	0.0127	0.0173

Sources: Bank Indonesia and BPS (calculated).

TABLE 2. ESTIMATION RESULTS OF ALMOST IDEAL DEMAND SYSTEM, 1990-2012

Expenditure	CS		I		G		M	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
a	1.0684	4.8131	-0.8434	-4.5840	0.3043	2.7500	0.4708 ^{b)}	2.4861 ^{f)}
b(1)	0.3866	14.0133	-0.2816	-14.7408	-0.0524	-3.6432	-0.0526 ^{c)}	-4.1451 ^{e)}
b(2)	-0.2816	-14.7408	0.2104	12.8126	0.0241	2.5234	0.0471 ^{a)}	8.5082 ^{e)}
b(3)	-0.0524	-3.6432	0.0241	2.5234	0.0313	2.3799	-0.0030 ^{a)}	-11.2769 ^{e)}
b(4)	-0.0526 ^{a)}	-4.1451 ^{e)}	0.0471 ^{a)}	8.5082 ^{e)}	-0.0030 ^{a)}	-11.2769 ^{f)}	0.0084 ^{a)}	10.7596 ^{f)}
c	-0.0433	-2.5466	0.0805	5.7107	-0.0182	-2.1476	-0.0190 ^{d)}	3.6283 ^{e)}

Note: a) estimates were calculated from the restriction: $\sum b_i = 0$; b) estimate was calculated from the restriction: $\sum a_i = 1$; c) estimate was calculated from the restriction: $\sum b_{ij} = 0$; d) estimate was calculated from the restriction: $\sum c_i = 0$; e) standard error was taken from direct estimation of share of consumption and share of import function; f) standard error was taken from direct estimation of share of government and share of import function.

Table 1 also delivers standard deviation presenting how far dataset lay from its mean. The standard deviation is consistent with the distance of maximum-minimum value. Statistically, a set data is said to be relatively volatile if its CV (ratio of standard deviation to its mean) is more than 50 percent. Based on the empirical rule, household consumption has the lowest CV implying the associated variable is the most stable. Import, on the other hand, is the most volatile.

In general, the prices of commodity are more volatile than their own expenditure. All of the CV of prices exceeds 50 percent. It seems that prices are relatively fluctuated in particular price of investment (the highest CV, 84.88 percent) suggesting that stabilization remains the main macroeconomic issue in Indonesia. Consequently, macroeconomic policy stabilization should be focused on this issue to ensure that prices fluctuation do not adverse economic activities for all economic agents.

The SURE estimation results of the Zellner's method (1962) for four equations are presented respectively in Table 2. Statistically, the estimated structural equation model of AIDS is significant for all expenditure categories indicated by t-statistics is greater than the associated t-table at 5 percent or even 1 percent levels. Unfortunately, when we imposed dummy variables to accommodate the Asian financial crisis in 1997 and global financial crisis in 2008 do not perform significantly.

These results confirm to the analysis of descriptive statistics above that all of expenditures are relatively stable in the whole period of observation. However, our attention and the analysis are not aimed at the results of the structural model (Table 2). The parameters that have economic meaning are the derived coefficients that show the price and income elasticity indices for the corresponding expenditure (Table 3).

The own-price elasticity fulfills the requirement of conventional demand theory behavior. This means that a rise 1 percent in 'price' in household consumption, for instance, will decrease the quantity of household consumption for about 0.12 percent on the average. Similarly, an increase in 'price' in government and import will decrease the quantity of associated expenditures for about 0.49 and 0.95 percent on the average respectively.

An exception is applied for investment which has a positive own price elasticity. Fortunately, the magnitude is quite low and statistically insignificant^{*)}. It seems that demand for investment is not sensitive to the 'price' of investment rather highly responsive to the income. The income elasticity with respect to investment is the highest, 1.42, compared to the others. It implies that the increase 1 percent in income tends to raise the quantity investment 1.42 percent.

The income elasticity with respect to government expenditure, on the other hand, is the lowest one, 0.71 consistent with the lowest share of the total expenditure. This suggests that government runs pro-cyclical fiscal policy in the moderate rate. This also confirms to the finding of Abdurrohman & Resosudarmo (2017). The pro-cyclicality of fiscal policy implies the occurrence of Wagner law. Regarding to the magnitude (less than unity), it seems that voracity hypothesis does not exist.

Overall, the income elasticity is positive for four cases. The positive income elasticity index shows that economic agent's expenses on consumption, investment, government, and import goods and services move along the line of the income consumption curve (ICC). The ICC shows that in the case of commodity prices change, any increase in income will induce the demand for all of the four commodities. Effects that cause changes in the amount of goods consumed as economic agents move along the line of the new ICC to a higher level, which implies the same expenditure previously is called expenditure effect.

Table 3 also highlights the cross-price elasticity for all four types of expenditures. The cross elasticity of government expenditure with respect to household consumption tends to be negative (-0.11) as well as the cross-price elasticity between consumption and investment (-0.59). The earlier results implies that a fiscal contraction that makes government goods relatively more expensive will induce substantial expansion in private consumption, thereby offsetting or even outweighing the negative impact of the fiscal contraction on aggregate demand. Therefore, the crowding-out occurs, i.e. the

^{*)} We have tried estimating all possible structural equations to statistically verify the price of investment elasticity. The results are available upon request.

government consumption expenditure is substitute for household consumption spending. This result conceptually confirms to the classical school of thought especially ultra-rationality assumption proposed by David & Scadding (1974). Empirically, it supports to the studies of Blanchard & Perotti (2002) and Mitra (2006).

In contrast, the cross-price elasticity of government spending with respect to investment expenditure shows a positive sign (0.10) as well as the cross-price elasticity between government consumption and import (0.03). They imply that a fiscal contraction that makes government goods relatively more expensive will generate a large negative income effect that outweighs the substitution effect, leading to a concomitant contraction in private investment and import expenditures that further depresses aggregate demand. These predictions about the two kind of expenditures' reaction to fiscal austerity seem to be consistent with what we have been observed during the 1997 Asian financial crisis. Given that, we can say the existence of crowding-in that is the government consumption expenditure is complement for investment and import expenditures. The former supports to the Keynesian paradigm as Vegari (1988), Santoso (1992), and Fatás & Mihov (2001) empirically found.

The interpretation of the negative cross-price elasticity between government consumption and private consumption; government consumption and investment; and private consumption and investment is not ambiguous anymore as found by Vegari (1988) and criticized by Santoso (1992). Vegari found that a rise in government expenditure will increase private consumption so that government expenditure does not crowd out private consumption.

In Santoso's view, for the private agents, the increase in consumption would reduce their savings and therefore reduce the available fund to finance their investments. Therefore, according to Santoso, Vegari actually found a crowding-out existence. In our work, we clearly find that a rise in government expenditure will reduce household consumption; the decrease in household consumption is then followed by the increase in investment as precisely found from the direct effect of the increase in government consumption on investment expenditure.

The existence of crowding-in effect of fiscal policy on investment is good news. Fiscal policy in the form of government expenditure allocated on public infrastructures will become a social capital which is complement to private capital used to produce higher output capacity. As a result, economic growth will increase. However, the existence of crowding-in effect of fiscal policy on import is bad news. Fiscal policy in the form of government expenditure allocated on public goods will be followed by demand for private goods from abroad. In the case of Indonesia, most of imported goods are typically capital goods. It seems that social capital will be optimal in accordance with the availability of imported capital goods. Eventually, this will repress current account balance which counter-productive to the external rebalancing spirit.

TABLE 3. OWN PRICE, CROSS PRICE, AND INCOME ELASTICITY, AIDS 1990-2012

Expenditure	CS	I	G	M	Z
CS	-0.1259	-0.5874	-0.1067	-0.0870	0.9070
I		0.0202	0.0991	0.1286	1.4210
G			-0.4885	0.0337	0.7134
M				-0.9509	0.9321

Source: Processed form Table 2.

So far, we have discussed partially the possible crowding-out and crowding-in. For most expenditure, fiscal policy shocks do not seem to have either a positive or a negative effect on private spending. In the case that the magnitude of the increase in government expenditure is less than that of the decrease in private spending, the crowding-out effect takes places. In contrast, the magnitude of the increase in government expenditure is greater than that of the decrease in private spending, the crowding-in effect exists. This is somewhat encouraging for rebalancing because it implies that a moderate medium-term quantitative expansion of the government will not come substantially at the expense of private demand.

We conclude that the existence of partial crowding-out, i.e. the expansionary government consumption does not wholly crowd-out the private spending. Furthermore, based on the value of the change in consumption, investment, and import as a result of government expenditure increases, which amount -0.11, +0.10, and +0.03 respectively, the overall impact of the increase 1 percent in government spending will increase in net the private spending (i.e. consumption, investment, and import) for about +0.03.

In comparison with Kuncoro (2000), the present result is slightly similar. Using annual data, he found that the increase 1 percent in government spending will increase in net the private spending (i.e. consumption and investment without component of import) for about +0.05. It seems that incorporating import component tends to reduce the total effect of expansionary government expenditure on private spending as consequence of current account deficit.

5. Concluding remarks

It is generally accepted that the impact of fiscal policy on the national output depends to a large extent on whether or not fiscal expansion crowds-out private consumption and investment. This paper attempts to identify the substitutability or complementarity or even independently between government expenditure and private spending. The basic of our analysis is the theory of demand system.

We contribute to the empirical literature on the effect of government spending on economic activity, by assessing the impact of changes in government spending simultaneously on the private spending. Unlike previous studies, we take into account household consumption, investment, and import in compliance with the national income product based on expenditure approach. We do this by analyzing quarterly data over the period of 1990-2012 using the almost ideal demand system.

The results of our paper suggest that government consumption spending is substitutable with private consumption implying that it produces important crowding-out effects. In contrast, government spending yields crowding-in by positively affecting both private investment and import suggesting that government spending is complement with private investment and import. In short, there are mixed evidences of crowding-out and crowding-in effect that is partial crowding-out takes place in the case of fiscal policy in Indonesia.

Furthermore, the elasticity of government expenditure with respect to income is the lowest while that of investment is the highest. Those findings suggest that the public sector is decreasing in relative economic importance gradually taken over by private investment sector to promote economic growth. Therefore, as the economy grows, the economic policies of governments should have a tendency to more heavily focus on economic stabilization especially in relation to external imbalance induced by tendency of increase in import.

Our analysis in fact neglected exports which are assumed as exogenous variable. Further research could be conducted by incorporating export as endogenous variable. This is important to assess because external imbalance in developing countries is highly associated

with export dependency. Consequently, the current account deficit will be accompanied by chronic fiscal deficit in the long term. Therefore, as far as fiscal policy is employed as an economic stabilization tool, the central government needs to recognize the specific structural and institutional features. It seems that unconventional fiscal policy is necessary to address the issue.

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