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# Does Government Expenditure Crowds Outthe Private Domestic Investment? Empirical Evidence of Indonesia

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**Abstract**:

*The objective of this study is to examine the effect of government expenditure on private domestic investment in Indonesia. Based on the previous studies, there is no clear justification whether government expenditure is crowding in or crowding out the private investment. Using quarterly time series data during period 1985 to 2012, the empirical results show that government expenditure (total) is crowding out private domestic investment in both short term and long term. Specifically, government expenditure for public service is crowding out the private investment in both short term and long term. Unlike public services, the economic expenditure is crowding in the private investment in the long term. Moreover, health expenditure is crowding out the private investment in the short term while education expenditure is crowding out in the short term and crowding in in the long term.*

**Keywords:** government expenditure, crowding out, private domestic investment, error correction model.

**JEL Classification**: E22

## 1. Introduction

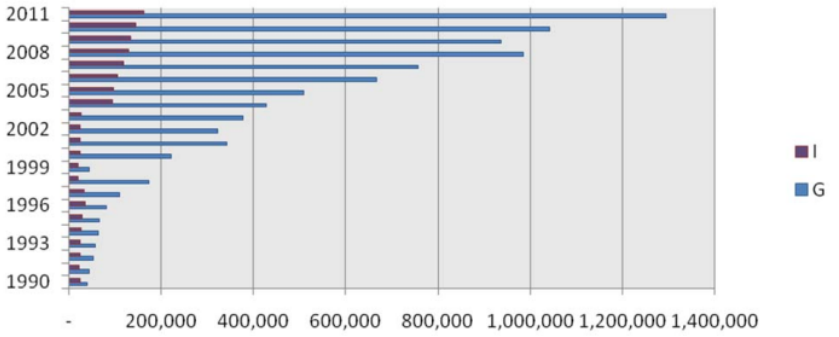
Investmentis one of themain important pillarsof the economic development. Through investment, the capital flows to the country can be usedforbusiness improvements, improve the employment opportunities, support the production process and technological transfer, as well as access tointernational marketsthrough the export products. In order to improve the investment level of the country, the fiscal expansion is necessarily needed by the government.

According to Keynesian economists, the fiscal expansion through an increase in government expenditure led to a better infrastructure, better health and education as a result of an increase in private investment. The reason is due to the fact that the government expenditure can reduce production costs and its consequences to the private investment. In other words, according to Keynesian, private investment becomes an important channel for the effectiveness of fiscal policy in promoting economic development (Ahmed and Miller 2000, Ahmad and Qayyum 2008, Hussain, *et al.* 2009). This argument is also in linewith Narayan(2004)showing that government spendingas a driving forceforprivate investmentwhich in turn drives the economic growth of the country. The positive role of government expenditure on private domestic investment is called the crowding-in effect.

However, in practice, an increase in government expenditure not always followed by the more intensive private investment. According to classical economists, an increase in government expenditure led to increase the interest rates and then decrease the private investment. This phenomenon is called the crowdingout effect of government expenditure. In other words, the crowding out occurs when the expansionary fiscal policy caused rising in interest rates, thereby reducing private expenditure, especially investment (Dornbusch, Stainley and Startz 2008). This process happens especially where public sector activities are financed through several loans that lead to an increase in market interest rates and the increase in the cost of capital to the private sector. As a result, an increasing in government expenditure over the cost or expense of private sector will have a negative impact on private investment (Hussain, Muhammad Akram and Lal 2009). Some other empirical studies that support the crowding-out effect of

government expenditure on private investment including Pradhan, Ratha and Sarma (1990), Ganelli (2003), Voss (2002), Narayan (2004), Kustepeli (2005), Basar and Temurlenk (2007), and Ang (2009).

The objective of this study is to examine the impact of government expenditure on private investment in Indonesia during 1985 - 2012 periods. As presented in *Figure 1*, the relationship between the government expenditure and private investment in Indonesia is relatively ambiguous. Although there a tendency of positive relationship of government expenditure private investment in the recent year, an increase in government spending is not always followed by an increase in the private investment. The previous studies of Indonesia (*see for example* Kuncoro 2000, Hidayat 2005) showed that government expenditure has both crowding out effect on private investment and crowding in effect on private consumption, particularly in the short term.




*Notes*: (I) Private Investment and (G) Government Expenditure
*Source*: Central Statistics Board and Bank of Indonesia, 2012

Figure 1 - Private Investment and Government Expenditure in Indonesia,in billion Rupiahs (1990-2011)

This study extends the analysis by dividing the total government expenditure into four specific utilizationof expenditure including public service expenditure, economic expenditure, health expenditure and education expenditure. Beside total government expenditure, in this case, all of the specific expenditure will be estimated separately to see their effects on private investment. This classification is similar to what Wang (2005) and Laopodis (2001) did using Canadian data in the previous studies.

The outline of this paper is as follows. The second section discusses the research methodology used in this study. The third section discusses the empirical results. Finally, the fourth section concluded the findings.

## 2. Research methodology

The method used in this study is the Error Correction Model (ECM) developed by Domowitz and El Badawi (1987). One of the strength of ECM is the fact that ECM accommodates the possible existence of shock variable that can influence expectation of economic agents or policy makers (Widarjono 2007). Before estimating the model, the unit root test of the Augmented Dickey Fuller and the cointegration test are conducted to see the stationary level of the data and to see possible long run relationship (long run stability) among the observed variables. In this case, it is expected that the observed data should be stationary in the same level, so the variance of the data is not too high and has a tendency near to the average value (Widarjono 2007).

Specifically, the ECM used in this study is as follow:

$$\Delta lnY_t = \beta_0 + \beta_1 \Delta lnX_{1t} + \beta_2 \Delta lnX_{2t} + \beta_3 \Delta X_{3t} + \beta_4 \Delta X_{4t} + \beta_5 \Delta lnX_{5t} + \beta_6 \Delta lnX_{6t} + \beta_7 \Delta lnX_{1t-1} + \beta_8 \Delta X_{2t-1} + \beta_9 \Delta lnX_{3t-1} + \beta_{10} \Delta X_{4t-1} + \beta_{11} \Delta lnX_{5t-1} + \beta_{12} \Delta lnX_{6t-1} + \beta_{13} EC_{t-1} + \varepsilon \quad (1)$$

*where*:$Y_t$: Private Domestic Investment; $X_{1t}$: Government Expenditure; $X_{2t}$: Gross Domestic Product; $X_{3t}$: Interest Rate; $X_{4t}$: Inflation Rate; $X_{5t}$: Minimum Wages; $X_{6t}$: Political Risk.

The dependent variable is the private domestic investment, while the main independent variable is the government expenditure. Following Wang (2005) and Laopodis (2001), besides estimating total government expenditure, this study also estimates using specific components of government expenditure separately including public service expenditure, economic expenditure, heath expenditure and education expenditure in separate equation. If the coefficient is negative and significant, we can say that government expenditure has a crowding out effect on private investment, while in contrast the crowding in exists when the government expenditure has a positive and significant effect on private investment.

In addition, Gross Domestic Product (GDP), Real Interest Rate, Inflation Rate, Minimum Wages and Political Risk variable are included as the control variables. Inflation rate is included to measure uncertainty and calculated based on the Consumer Price Index published by Central Board Statistics, while average minimum wage measures the labour cost in the economy. In addition, political risk based on the International Country Risk Guide (ICRG) survey is included to see the political condition that might influence the investment level. Beside political risk that is colledted from ICRG, the other data are collected from Central Board of Statistics and Bank of Indonesia. The data is quarterly during the period of 1985 to 2012.

In order to see the validity of the ECM, Error Correction Term (ECT) is added as independent variable. As pointed out by Insukindro (1999), ECM models can be categorized as a valid estimate when the coefficients regression of error correction ($ECT_{t-1}$) is statistically significant.

## 3. Empirical results

As mentioned above, the unit root test and cointegration test are estimated before the ECM estimate. The unit root test results is presented in Table 1. Using Augmented Dickey Fuller (ADF) method, all variables are not stationer at level (zero degrees) the result shows that the p value of the ADF statistic is more than 5% indicating insignificant results. Therefore it is necessary to do the unit root test by using first degrees (first differences). Using first difference, all of the data used in the ECM, including all components of government expenditure are stationer as the probability of ADF statistic is less than 5%. Therefore, we can conclude that all of the data used in this study are stationer in the same level at first difference. In other words, the data fulfil the stationary conditions and then can be continued to the co integration test.

Table 1-The Result of *Unit Root* Test

| Variable | Level | | 1st difference | |
|---|---|---|---|---|
| | ADF-stat | Probability | ADF-stat | Probability |
| Investment | -1.961109 | 0.6154 | -6.654612 | 0.0000 |
| GDP | -1.782097 | 0.7069 | -7.290688 | 0.0000 |
| Government Expenditure (Total) | -2.693471 | 0.2415 | -8.548827 | 0.0000 |
| Real interest rate | -2.608589 | 0.2776 | -6.987706 | 0.0000 |
| Inflation | -2.283736 | 0.4386 | -5.674454 | 0.0000 |
| Minimum wage | -1,732327 | 0.7302 | -7.327640 | 0.0000 |
| Political Risk | -1.930691 | 0.6317 | -6.001854 | 0.0000 |
| Public Service Expenditure | -1.784391 | 0.7056 | -6.594994 | 0.0000 |
| Economic Expenditure | -2.530612 | 0.3131 | -8.017029 | 0.0000 |
| Health Expenditure | -1.113466 | 0.9214 | -7.841597 | 0.0000 |
| Education Expenditure | -2.034141 | 0.5758 | -9.238313 | 0.0000 |

*Source*: Own Work

The cointegration test is conducted to determine the possible long term relationships among the observed variables. Johansen cointegration test is used using lag 1 until lag 4 for all specifications (including all component of government expenditure). The result of cointegration test is presented in Table 2. As presented, the probability is less than 5% indicating that all of the variables are cointegrated or all of the variables have stability in the long term.

Table 2 - The Result of Cointegration Test

| Hypothesized No.of CE(s) | Eigenvalue | Trace Statistic | 5 Percent Critical Value | Prob.** | |
|---|---|---|---|---|---|
| None* | 0.474184 | 170.6322 | 125.6154 | 0.0000 | Government Expenditure (Total) |
| At Most 1* | 0.312430 | 101.8523 | 95.75366 | 0.0178 | |
| At Most 2 | 0.264683 | 88.29314 | 88.80380 | 0.0544 | |
| None* | 0.474184 | 170.6322 | 125.6154 | 0.0000 | PublicService Expenditure |
| At Most 1* | 0.312430 | 101.8523 | 95.75366 | 0.0178 | |
| At Most 2 | 0.228208 | 61.77094 | 69.81889 | 0.1850 | |
| None* | 0.348556 | 129.9683 | 125.6154 | 0.0264 | Economic Expenditure |
| At Most 1 | 0.245686 | 84.11197 | 95.75366 | 0.2408 | |
| At Most 2 | 0.185429 | 53.94369 | 69.81889 | 0.4640 | |
| None* | 0.422565 | 138.9266 | 125.6154 | 0.0060 | Health Expenditure |
| At Most 1 | 0.273527 | 80.16661 | 95.75366 | 0.3591 | |
| At Most 2 | 0.169158 | 45.97435 | 69.81889 | 0.7983 | |
| None* | 0.513805 | 172.9822 | 125.6154 | 0.0000 | Education Expenditure |
| At Most 1* | 0.292253 | 95.81957 | 95.75366 | 0.0495 | |
| At Most 2 | 0.239685 | 58.83301 | 69.81889 | 0.2730 | |

*Note*: Trace test indicates 2 cointegration equation(s) at 5% level; *) Denotes rejection of the hypothesis at the 5% level; **) MacKinnon-Haug-Michelis (1999) p-values.

The result of the ECM in the short term is presented in Table 3. As presented, the government expenditure (total) has a negative and significant to the private investment, suggesting a crowding out effect of government expenditure. Specifically, an increase in government expenditure by 1% decreases the private investment by 1.93% in the short term. The result is similar to the findings made by Ganelli (2003), who found the crowding out effect between government expenditure and private investment in the short term.

Looking at the other variables, minimum wage and political risk have also a negative and significant effect on private investment, due to that the probability value of each variable is less than 5%. Looking at the coefficients, the minimum wage has the most dominant influence on private investment as the coefficient is largest among variables that affect private investment. In addition, GDP, real interest rate and inflation rate are not statistically significant influencing private investment in the short term.

Table 3-Estimation result of ECM in the short term

| Variable | Coefficient | t-statistic | S.E. | Probability |
|---|---|---|---|---|
| C | -9.422084 | -3.199807 | 2.944579 | 0.0019 |
| D(ln Gov't Exp) | -1.934869 | -4.989381 | 0.387797 | 0.0000 |
| D(lnGDP) | 1.209180 | 0.578187 | 2.091329 | 0.5645 |
| D(Interest Rate ) | -0.003578 | -0.165153 | 0.021666 | 0.8692 |
| D(Inflation) | 0.018329 | 1.163880 | 0.015748 | 0.2473 |
| D(ln Minimum Wage) | -2.066808 | -2.646432 | 0.780979 | 0.0095 |
| D(Political Risk) | 0.214066 | 5.300126 | 0.040389 | 0.0000 |
| ECT | 0.061410 | 1.678231 | 0.036592 | 0.0965 |
| $R^2$ | 0.534087 | | | |
| F | 8.553329 | | | |
| DW | 1.846559 | | | |

*Source*: Own Work

The ECM estimate shows that the model is valid, indicated by the ECT coefficient that is significant with the probability value of less than 10%, or in other words it is significant at 90% level. The ECT

coefficient in the model is 0.061, which means that the difference between the actual value of private investments and equilibrium value as much as 0.061 and it will be adjusted within less than one quarter.

Looking at the autocorrelation, the Breusch-Godfrey Serial Correlation LM test shows that there is no autocorrelation problem in this model. Furthermore heteroscedasticity test using white model show that chi-squares values is 0.3522 (35.22%) is greater than α = 5%, which means homoscedastic. In the other words, there is no heteroscedasticity problem in that model. *Furthermore*, multicollinearity test also showed that the models used in these equations do not experience serious multicollinearity problems.

Table 4- ECM estimation result in long term

| Variable | Coefficient | t-statistic | Prob |
|---|---|---|---|
| D(ln Gov't Exp) | - 0.735884 | -2.31302 | 0.0226 |
| D(ln GDP) | 16.962449 | 51.32005 | 0.0000 |
| D(Interest Rate) | - 0.550203 | -1.73439 | 0.0857 |
| D(Inflation) | 0.027813 | 0.087676 | 0.9303 |
| D(ln Minimum Wage) | -3.096091 | -10.0266 | 0.0000 |
| D(Political Risk) | -0.791691 | -2.49572 | 0.0141 |

*Source*: Own Work

The ECM result in the long term is presented in Table 4. Consistent with the short term result, the government expenditure (total) shows negative effect on the private investment. The coefficient of government expenditure (total) to is -0.736, meaning that if government expenditure increases by 1 percent will reduce private investment as much as 0.736%. Consistent with the short term, we can conclude that the effect of government expenditure in the long term shows that government expenditure is crowding out the private investment.

Similarly to the short term, minimum wage and political riskare also negative related and significant to private investment. Unlike the effect in the short term, the real interest rate has a negative and significant effect on private investment in the long term, while GDP has a positive and significant effect on private investment in the long term. Inflation in this case is not significant.

In general, this results support classical hypothesis about crowding out effect of government expenditure. The empirical results also support the findings of a number of studies in various countries (Voss 2002, Narayan 2004, Hidayat 2005, Basar and Temurlenk 2007, Ang 2009, Furceri and Sousa 2011). As stated by Alani (2006), crowding out usually happens when government expenditures are financed mainly from loans (such as Indonesia), that will more likely to lead an increase in interest rates that decrease the willingness of private sector to investment. This is also supported by Bailey (2002) stating that when government intervention in the economyfinanced from deficit financing, it will more likely to lead a decline in private sector activity.

In the case of Indonesia, government expenditure normally has the purpose to improve people's welfare through the development and providing infrastructure and public facilities. The budget deficit policy is always conducted as an instrument taken by the government. Therefore, the government expenditure aimed to increase investment absorbing private saving, thereby the private investment assets is reduced. This indicates that there is a substitution effect between the private sector and the government sector. The budget deficit was initially encouraging private investment, but when government made investments by a loan, thus the budget deficit continues to rise.

The result has implications for the government budget inefficiency that relate to the inefficiency of government expenditure in the long term. Such conditions will lead a decline in private investment and will reduce economic growth and reduce employment opportunities as well. The effect of government expenditure on private investment is then estimated separately using four specific components of government expenditure, including public service expenditure, economic expenditure, health expenditure, and education expenditure. The summary of the results for each component in the short term and long term is presented in Table 5.

Table 5 -The summary of ECM estimation result of government expenditure in short term and long term

| Variables | Short Term | | | Long Term | | |
|---|---|---|---|---|---|---|
| | Coefficient | t-statistic | Prob | Coefficient | t-statistic | Prob |
| D(ln Public Service Exp.) | -1.633387 | -4.983054 | 0.0000 | -2.153400 | -6.13559 | 0.0000 |
| D(ln Economic Exp.) | -0.044416 | -0.170281 | 0.8651 | 1.205962 | 2.44083 | 0.0163 |
| D(ln Health Exp.) | -0.519450 | -4.989381 | 0.0215 | 0.374935 | 1.064726 | 0.2894 |
| D(ln Education Exp.) | -0.379336 | -1.669204 | 0.0983 | 1.071248 | 2.68366 | 0.0084 |

*Source*: Own Work

Firstly, using the public service expenditure, the coefficient sign is the same with using total government expenditure which is negative and signficant with the coefficient of -1.63 in the short term and -2.15 in the long term. The results mean that if public service expenditure increases by 1%, it will lower the private investment as much as 1.63% in the short term and 2.15% in the long term. In other words, in both short term and long term, public service expenditure is crowding out the private investment, which is in line with Wang (2005) study in Canada.

In practice, public service expenditure is the largest share from the total expenditure of central government compared to the other government expenditure functions such as economic, health and educational expenditures. Public service function is managed by the state general treasurer primarily to finance the programs including debt interest payments program, subsidies and transfer payments programs, finance the executive and legislative, and also foreign affairs. The finance is generally derived from the loans made by the government through the sale of bonds and also from tax revenue. It has a positive impact on improving the quality and quantity of public services but with no direct impact on economic growth. Considering that allocation of expenditure is not largely address to the infrastructure development projects, therefore it will notprovide the multiplier effect on private investment and economic growth.

Secondly, using economic expenditure, the coefficient is not significant in the short term. In other words, we can say that the economic expenditure is not responded by the private investment in the short term. The possible reason is because of the time spent that might be too short.In the long term, the economic expenditure is positive and significant on the private investment.The coefficient of economic expenditure is 1.206 meaning that if the economic expenditure increases by 1% it will increase the private domestic investment by 1.206 in the long term. Therefore, unlike public service expenditure, the economic expenditure is crowding in to private investment for long term.

In practice, in Indonesia, the economic expenditureis the third largest expenditure after public service and education and is used for finance programs of transport infrastructure, agriculture, irrigation, and energy that is expected to support the efforts in order to accelerate the economic growth. This study supports Erden and Holcombe, (2005) and Afonso and Aubyn (2009) that suggest to support the infrastructure sector to increase the private investment. To support infrastructure for Indonesian case, the public-private partnership is needed to maintain the minimum service standards and to accelerate the infrastructure provision.The comprehensive infrastructure is also needed providing the management and operation program of sea transportation, land, air, and railroad system.

These resultsalso suggest that the economic expenditure will encourage the increase of the private investment particularly when it focuses on productive expenditure, such as infrastructure in transportation (Hasan, *et al.* 2011). The efficiency of the government budget therefore is necessarily needed, which is finally boost the economic growth and increase people's welfare. At last, it would lead the increasing of private domestic investment and accelerate the national development.

Thirdly, using health expenditure, the coefficient is negative and significant for short term. The coefficient is -0.519 meaning that if the health expenditure increases by 1%, it will decrease the private investment by 0.519%. In other words, in short term, health expenditure is crowding out the private domestic investment.

In the long term, health expenditure coefficient is not significant indicating that private investment does not respond well to the health expenditure. All of these results have also implications about the ineffectiveness of the health expenditure realization. Compared to the public service and education expenditures, the government budget for health service in Indonesia is relatively small and has not shown the expected results particularly in the long term

Finally, the education expenditure shows a significant negative effect on private investment in the short term. In practice, education expenditure is the second largest expenditure in Indonesia after the public service. The coeffiecient is -0.379 meaning that an increase in education expenditure by 1% will decrease the private investment by 0.379%. Therefore, the education expenditure is crowding out the private investment.

In contrast, in the long term, education expenditure shows a positive and significant effect on private investment. The coefficient is 1.071, meaning that an increase by 1% will increase private investment by 1.071%. Therefore, in the long term, the education expenditure is crowding in the private investment. This result is consistent with Keynesian hypothesis that government expenditure of education can stimulate the private investments and become an important channel for the effectiveness of fiscal policy in enhancing the economic development (Ahmed and Miller 2000, Ahmad and Qayyum 2008, Hasan, *et al.* 2011).

Education expenditure in practice is a reflection of the government efforts to provide community services and their responsibility in terms of education. By improving the quality of human resources, therefore the educated and skilled population or labour force will be good assets to have quality employment as one of the production factor. As a consequence, it will attract investors to invest in Indonesia particularly in the long term.

## Conclusions

This study has examined the effect of government expenditure on private domestic investment in Indonesia, whether government expenditure is crowding in or crowding out the private investment. Using quarterly time series data during period 1985 to 2012, the empirical results show that government expenditure (total) is crowding out private domestic investment in both short term and long term indicating a potential inefficiency of government expenditure in both short term and long term. The results support classical hypothesis about crowding out effect. The crowding out usually happens when government expenditures are financed from loans that will more likely to lead an increase in interest rates that decrease the willingness of private sector to investment.

Looking at specific components of government expenditure, public service expenditure is crowding out private domestic investment in both short term and long term. As most of the expenditure is generally for non-productive programs, such as debt interest payments program, subsidies and transfer payments programs, finance the executive and legislative, and also foreign affairs, so the impact on private investment is negative.

Unlike public service, economic expenditure is crowding in the private domestic investment for long term. In practice economic expenditure includes productive expenditure such as infrastructures which encourage increased private domestic investment. This will also implied foreeffectivebudget managementthat canprovidea multiplereffecton economic growth.

Moreover, health expenditure is crowding out the private investment in the short term implying an efficient allocation of government budget in terms of health. Meanwhile education is crowding out the private investment in short term and is crowding in for the long term. In the long term, it seems that education expenditure can stimulate a creation of qualified human resources that might attract more private investment.

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