The effect of government expenditures on economic growth: the case of ASEAN-5 in the period 1990-2012

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INTRODUCTION

- Sustainable economic growth is one of the leading goals in developing countries.
- Among many factors affecting economic growth, the interest is placed on the role of government in general and government expenditures in particular.
- In the period from 1990 to 2012, ASEAN-5 including Indonesia, Malaysia, Philippine, Thailand and Vietnam experiences a significant economic growth with the average annual growth rate of 5.4%. Also in this period, the share of government expenditures to GDP for the group is 20.5% and government expenditures increase at the average rate of 6.2% per annum.
- What is the impact of government expenditures on economic growth for the group in this period?
Theoretical views on the effect of government expenditures on economic growth

Debate on the effect of government expenditures on economic growth

- **Support argument**
  - Government spending has a positive impact and promotes economic growth through the implementation of the two functions – protection and provision of public goods.

- **Against argument**
  - Government spending can undermine economic growth by distorting resource allocation as economic resources are transferred from productive private sector to unproductive government sector, crowding out private investment and inhibiting innovation in many areas of the economy.

- **Views on the optimal size of government spending**
  - Government spending has a positive effect on economic growth when the share of government spending on GDP is small and has a negative effect when its share becomes large. The inverse U curve suggests that there exists an optimal government spending size that maximizes economic growth rate.
COMPONENTS OF GOVERNMENT EXPENDITURES

- Government expenditures include various components that serve different functions.
- The study focuses on two categories: government consumption and public investment.
  - Government consumption expenditure consists of spending by government to produce and provide goods and services to the public.
  - Public investment reflects spending by government for capital formation.
THE MODEL

- Assume the aggregate production function for the economy
  \[ Y = F(K_p, K_G, L, G) \]
  - Where \( Y \) is output, \( K_p \) is stock of private capital, \( K_G \) is stock of public capital, \( L \) is labor and \( G \) is government consumption expenditure.
- The accumulation of private capital is via private investment
  \[ \Delta K_p = I_p \]
- The accumulation of private capital is via public investment
  \[ \Delta K_G = I_G \]
- Government consumption expenditure has a positive externality on production so that it enters the production function as an external input.
THE MODEL

- Take derivative of the production function and divided two sides for $Y$ we have

$$\frac{\Delta Y}{Y} = F_{K_p} \frac{\Delta K_p}{Y} + F_{K_G} \frac{\Delta K_G}{Y} + F_L \frac{\Delta L}{Y} + F_G \frac{\Delta G}{Y}$$

- Where

$$F_{K_p} = \frac{\Delta F}{\Delta K_p} : \text{marginal product of private capital},$$
$$F_{K_G} = \frac{\Delta F}{\Delta K_G} : \text{marginal product of public capital},$$
$$F_L = \frac{\Delta F}{\Delta L} : \text{marginal product of labor},$$
$$F_G = \frac{\Delta F}{\Delta G} : \text{marginal product of government consumption spending}.$$
The Model

Let \( \alpha = F_{K_P} \), \( \gamma = F_{K_G} \), \( \varphi = F_G \), and \( \beta = F_L \frac{L}{Y} \) be the elasticity of output with respect to labor, the equation is rewritten as

\[
\frac{\Delta Y}{Y} = \alpha \frac{I_P}{Y} + \gamma \frac{I_G}{Y} + \beta \frac{\Delta L}{L} + \varphi \frac{\Delta G}{G} \frac{G}{Y}
\]

Here is the growth equation showing that the economic growth rate depends on the ratio of private and public investment, the growth of labor, and the growth and the share of government consumption expenditure.
THE MODEL

- Establish the economic growth regression equation

\[ GRY_{i,t} = c + \alpha I_p GDP_{i,t} + \gamma I_G GDP_{i,t} + \beta GRL_{i,t} + \varphi g_{i,t} + e_{i,t} \]

- The growth rate of GDP is used for \( GRY \), the growth rate of labor is used for \( GRL \), the ratio of private investment is used for \( I_p GDP \), the ratio of public investment is used for \( I_G GDP \), and the product of the growth rate and the share of government consumption expenditure is used for \( g \).
The data are taken from World Databank and Asian Development Bank.

Data for growth rate of GDP (constant price), growth rate of government consumption expenditure (constant price), the ratio of gross capital formation to GDP and the ratio of government consumption expenditure to GDP are taken from World Databank.

Data on labor employment and the ratio of public capital expenditure to GDP are taken from Asian Development Bank.

The ratio of private investment to GDP is calculated as the difference between the ratio of gross capital formation to GDP and the ratio of public capital expenditure to GDP.
REGRESSION OUTCOME FOR THE EFFECT OF GOVERNMENT EXPENDITURES ON ECONOMIC GROWTH FOR ASEAN-5 (ADJUSTED FOR AUTOCORRELATION)

- **Dependent variable:** *Economic growth rate*

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_p \text{ GDP : Ratio of private investment to GDP}$</td>
<td>0.301</td>
<td>6.25 *</td>
</tr>
<tr>
<td>$I_g \text{ GDP : Ratio of public investment to GDP}$</td>
<td>0.26</td>
<td>1.89 **</td>
</tr>
<tr>
<td>GRL: <em>Growth rate of labor</em></td>
<td>0.403</td>
<td>3 *</td>
</tr>
<tr>
<td>g: <em>Growth rate of government consumption</em> × share of government consumption to GDP</td>
<td>0.021</td>
<td>3.46 *</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>-4.337</td>
<td>-3.53 *</td>
</tr>
</tbody>
</table>

- Number of observations: 98
- t-statistic: (*) 1% significant level; (**) 10% significant level
- Durbin-Watson statistic: 2

$R^2 (\overline{R^2}) : 0.44 (0.41)$

F-statistic: 18.12
Both government consumption expenditure and public investment have positive effects on economic growth.

- Public investment has a direct impact on economic growth through the formulation of public capital that accumulates more stock of capital for the economy.
- However, the coefficient for marginal product of public capital is less than that of private capital, suggesting that public investment is less efficient than private investment.
- Government consumption expenditure creates a positive externality effect on economic growth.
Regression Outcome for the Effect of Government Expenditures on Economic Growth for ASEAN-5, with the Lags on Public Investment

- **Dependent variable:** Economic growth rate

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<th>Explanatory variables</th>
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<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_p$ GDP : Ratio of private investment to GDP</td>
<td>0.3</td>
<td>6.343 *</td>
</tr>
<tr>
<td>$I_g$ GDP : Ratio of public investment to GDP</td>
<td>0.311</td>
<td>2.283 **</td>
</tr>
<tr>
<td>GRL: Growth rate of labor</td>
<td>0.401</td>
<td>3.01 *</td>
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<tr>
<td>$g$: Growth rate of government consumption $\times$ share of government consumption to GDP</td>
<td>0.02</td>
<td>3.46 *</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.583</td>
<td>-3.765 *</td>
</tr>
</tbody>
</table>

- Number of observations: 98
- t-statistic: (*) 1% significant level; (**) 5% significant level
- Durbin-Watson statistic: 2.02  $R^2$ ($\bar{R}^2$) : 0.45 (0.42)  F-statistic: 18.87
Regression Outcome For the Effect of Government Expenditures on Economic Growth For ASEAN-5, With the Lags on Public Investment

- Base on the argument that public investment is mostly on the development of infrastructures then there would be some time lags for public capital to realize its effect on economic growth.

- Regression outcome shows that when take into account the lags of public investment, the coefficient of marginal product of public capital has improved and shows nearly no difference with that of private capital.

- This suggests that the efficiency of public investment is similar to that of private investment.
CONCLUSION

- In the period 1990-2012, government expenditures have a positive effect on economic growth in the ASEAN-5 countries.
  - Government investment expenditure helps to increase the economy’s stock of capital and has a direct effect on economic growth.
  - Government consumption expenditure provides goods and services with positive externality that help to increase the productivity of the economy and thus plays an indirect role on economic growth.
POLICY IMPLICATIONS

In economic growth strategy for ASEAN-5, government expenditures continue to play an important role.

- Firstly, these countries are still in the early stages of development and economic growth still depends heavily on capital accumulation → investment spending by government is needed since it contributes to the formation and development of the economy’s stock. However, the efficiency of public investment should be in great care.

- Secondly, since government consumption expenditure has a positive externality effect on economic growth then a larger share of this spending should be allocated on providing goods and services with positive externality like education, health, and technology development and application.

- Finally, for government spending to have the positive effect outweighs its negative effect on economic growth, the share of government expenditures to GDP should be in a good control.