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THE EFFECT OF GOVERNMENT SIZE ON ECONOMIC PERFORMANCE: AN EMPIRICAL INVESTIGATION ON A GROUP OF DEVELOPING COUNTRIES USING A PANEL DATA APPROACH

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Tayseer Al-Sumadi and Basudeb Biswas

ABSTRACT

This paper examines the effect of government size, measured by the ratio of government consumption expenditures to gross domestic product, GDP, on the rate of growth of per capita GDP. Our sample includes 30 low-income and middle-income developing countries over the period 1970-90. We use a panel data approach to avoid the shortcomings of the cross-country models often used in such an analysis. The results indicate government size has a highly significant negative influence on the rate of economic growth.
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1. Introduction

The heated debate about the extent of the government role in economic activities is nothing new in the economic literature. In the sixteenth century, the mercantilist school advocates "favored a strong central government to enforce the regulation of business" (Oser and Blanchfield, 1975, p. 11). At that time, the government played a vital role in the economy and adopted different policies of intervention, which included granting monopoly privileges, imposing restrictions to limit competition, and providing subsidies to different economic sectors.

The eighteenth century witnessed the rise of the classical school following the pioneering work of Adam Smith. The first and foremost principle of this school was laissez faire, which claims "[t]hat government is best which governs least" (Oser and Blanchfield, 1975, p. 44). The proponents of this free-enterprise economic theory argued the market is the right mechanism for efficient allocation of resources. Therefore, the government role in economy should be limited to the provision of public goods and services the private sector cannot or does not desire to provide. These include national defense, maintenance of law and order, and basic infrastructures such as railroads, ports, and dams.

The issue of government intervention took a new turn in the beginning of the nineteenth century after the emergence of Marxist socialism. This school took the opposite extreme of the classical school by introducing the idea of entrepreneurial government and favoring large-scale
government intervention in the economy. The protagonists of this school argued the market efficiency is attained under a set of unrealistic conditions, such as perfect competition and perfect information, and in the absence of these conditions the market is doomed to fail, which creates a *prima facie* for government intervention.

After World War II, the governments of developed and developing countries played a vital role in economic activities. In the developed world, the birthplace of free-market theories, government intervention came about as a result of the infrastructure destruction in the aftermath of the war. In the developing countries, the governments assumed the central role in the economy to build and develop the poor infrastructure. Most of the developing countries were under colonial rule, which was unfavorable to local entrepreneurs and hence did not encourage private investment. The legacy of the colonial era, coupled with the example of the Soviet model, resulted in a greater participation by the state in economic development.

Government intervention in these countries went beyond the traditional role when the public sector created many public enterprises engaged in industrial production in pursuing the import-substituting-industrialization policies. The expansion of the public sector encouraged rent-seeking activities at the expense of profit-seeking activities.

The oil crisis in 1979 and the external debt crises in the 1980s pointed to harmful effects of government-led policies. Moreover, the poor performance of public enterprises in developing countries over the last three decades highlighted the negative role of the government in the functioning of the economy. Since then, it was proven that pervasive government intervention contributed negatively to the overall economic performance.

The retrenchment of the developmental state paradigm and the sweeping privatization triggered an overwhelming research attempting to investigate the effects of government size on
economic and social welfare. In the absence of a clear-cut economic theory framework in this area, in addition to some other factors to be explained later, this research came with conflicting results. This paper aims to investigate the effect of government size on economic growth and to investigate whether privatization is the panacea for the economic problems plaguing developing countries. Our research departs from the vast majority of the received empirical literature in the following ways: First, we use a panel data approach to study the effect of government size, in lieu of a cross-country approach. Second, we provide overwhelming empirical evidence about the effect of privatization in the countries implementing this policy. Finally, we use the most recent data provided by Heston and Summers (1995).

The rest of this paper is organized as follows. Section 2 provides a theoretical explanation of the secular growth of government size over time. Section 3 contains a review of the empirical literature. Section 4 sheds light on the government role in the economies of some Asian countries, i.e., the East Asian Miracle. The theoretical model is discussed in Section 5. The data set and the empirical estimations are discussed in Section 6. We end up with concluding remarks in Section 7.

2. The Growth of Government Size

The secular growth of government spurred economists to investigate the reasons behind the growth of the government size. Consequently, many theories have been put forward to explain the growth of the public sector. These theories include a wide range of explanations, including social, political, and economic factors. We provide a cursory review of some of widely prevalent theories in explaining the growth of government size:
Wagner’s Law

One of the hypotheses aiming at explaining the secular growth of the government size is what is called Wagner’s law, which was introduced by Adolph Wagner in late nineteenth century. This hypothesis states that the income elasticity of demand for goods and services provided by the government is greater than unity. The government size is expected to increase as the level of per capita GDP increases.¹ This hypothesis failed to specify the stage of development in which this relationship is expected to occur. Moreover, it does not identify the pattern of change of particular components of government expenditures (Afxentiou, 1982).

The empirical test of this hypothesis yielded mixed results. Easterly and Rebelo (1993) found some support for Wagner’s law while Joulnaian and Marlow (1991) confirmed this hypothesis in the U.S. economy. Lin (1994) found evidence that this hypothesis was true only in developed countries. Ram (1987) found that while time-series models provide support for this hypothesis, the cross-sectional models do not. Ferris and West (1996), however, failed to confirm this hypothesis.

Public Choice Hypotheses

Some of the main functions of the government are to provide public goods and services as well as to eliminate, or at least mitigate, externalities. Based on this argument, some public choice hypotheses tend to explain the growth of the public sector. Median voter theorem and the interest group hypothesis are eminent among these hypotheses. The first one suggests the government opts to target certain groups of people (e.g., poor people, farmers, and urban population) who might possess noticeable voting power. To gain their votes, the government

¹See the appendix for the microeconomic foundation of this hypothesis.
might introduce some distributional measures to improve the welfare of these groups at the expense of others who do not have the same voting power. This theorem is more applicable to the democratic countries where the elections are held on a regularly basis to determine who will govern the country. The local and national governments in these countries tend to increase their expenditures by providing more goods and services (e.g., police, education, and transportation services) to satisfy the needs of the targeted people. This results in larger government with more public goods and services provided.

The interest group hypothesis explains the growth of government through the existence of special interest groups who put pressures on the government to introduce some activities designed to reduce the transaction costs borne by these groups. These groups could include the government employees who might have discretionary power to achieve their own interests at the expense of the citizens (Mueller, 1987). When the new activities are introduced, it becomes difficult to reduce or eliminate them in the future, which leads to secular growth in the size of the government. The empirical evidence of Ferris and West (1996) provides some evidence in support of these hypotheses.

Baumol’s Effect

The government sector is typically labor intensive since employment is one of the socioeconomic goals for any government. The growth of productivity is mostly embodied in technological change. Baumol’s effect or Baumol’s cost disease argues that service sectors, which are highly labor intensive, lag other sectors in productivity growth. Because of that, the cost of providing public goods and services will increase more quickly than for private goods. This causes prices of government goods and services to increase over time. Consequently, the share of government activities in GDP will also increase over time.
This hypothesis is based on the argument that the price elasticity of demand for goods and services provided by the public sector is less than unity.\(^2\) Mueller (1987) found that Baumol’s effect explains 25% of the increase in government size for the average Organization for Economic Cooperation and Development (OECD) country. Ferris and West (1996) reported empirical results which lend support to this hypothesis.

Fiscal Illusion Hypothesis

This hypothesis assumes that the citizens measure the size of government by the size of their tax bill. If the tax burden can be disguised then citizens cannot measure the true size of government, which can grow beyond the levels they tolerate (Mueller, 1987). Kneebone (1992) found support for the existence of fiscal illusion in the Canadian economy. Oates (1985) reported the following five sources of this illusion:

*Complexity of the tax structure.* This means the more complex the government revenue system, the more difficult for the voters to estimate the actual tax-price they pay for public goods and services.

*Renter illusion.* This occurs because the property tax is not paid by the tenants but by the owners, who tend to pass this tax to the renters in the form of high rents. This makes the tenants fail to link the size of government spending to their rent payment.

*Income elasticity of the revenue system.* This suggests people do not care about their tax bill but about their tax rate. Therefore, in booming times when the income level increases, the government levies more revenues and its size grows.

*Debt illusion.* In this case it is assumed the citizens care if the government projects are financed through taxation, but they do not care if these projects are financed by government

\(^2\)See the appendix for the microeconomic foundation of this hypothesis.
borrowing. Therefore, they fail to estimate the cost they bear as a result of this borrowing. This means reliance on borrowing rather than taxation to finance public projects results in larger government.

The flypaper effect. This means that the government officials can use the lump-sum intergovernmental grants to convince the voters that there is a decrease in tax rates needed to finance different government programs (Oates, 1985). Therefore, Oates (1985, pp. 23-24) defines the flypaper effect as the existence of “a significantly higher propensity for recipients to increase public expenditure in response to the lump-sum intergovernmental grants than in response to equivalent increase in private income.”

Political, Social, and Economic Ideology

As mentioned at the outset, many economic schools have arisen in the last few centuries. These schools have had different, political social, as well as economic backgrounds and implications. Consequently, the size of the government varied substantially depending on the ideologies prevailing in the subject countries. Government size was noticeably large in the countries that imbued with the socialist paradigm (e.g., former Soviet Union and East Europe). On the contrary, the government size in western countries, where the laissez faire dichotomy prevailed, was smaller with a large private sector taking the economic lead.

Displacement Effect

The displacement effect hypothesis states the tax burden can increase when the taxpayers believe that the increase is justified. For example, during war, depression, or other national crises, the government involvement is expected to increase, so “an otherwise intolerable tax burden may become acceptable” (Kneebone, 1992, p. 1297). However, because of the expanded
bureaucracy and the concentration of power at the national level, the new situation, i.e., the higher tax burden, is expected to continue even after the crisis passed (Slemrod, 1995).

3. Literature Review

In the last two decades, ample research about the effect of government involvement in economic activities on economic growth has taken place. Given the difficulties in assessing the real scale of government involvement, different proxies for this variable were employed, including the size of government consumption expenditure, government tax revenue, and the ratio of public enterprises output to national output. This research resulted in conflicting results with respect to the relationship between the government size and the rate of economic growth. The conflicting results can be attributed to factors such as using different proxies for government size, applying different proxies for the growth rate, using a sample of different countries at different time periods, and using different ad hoc models in the absence of theoretical framework to investigate the effect of government involvement as well as the process of economic growth. Many factors triggered the wide research in these areas such as the sharp macroeconomic imbalances of most countries, particularly in the developing world, the collapse of the command economies, and the availability of worldwide comprehensive data.

Using cross-sectional data on 43 developed and underdeveloped countries from 1955-70, Rubinson (1977) concluded there was a positive relationship between the government size, measured by the ratio of government revenue to gross national product, GNP, and economic growth. Employing cross-section data of 46 countries, Kormendi and Meguire (1985) found a positive, but statistically insignificant, relationship between economic growth and the size of government, indexed by government consumption as a ratio of GNP. Conte and Darrat (1988)
employed time-series data on all OECD countries from 1960-84. Their results indicated public sector expansion, indexed by total government outlays as a ratio of GDP, is not generally accountable for retarding economic growth in OECD countries. Using government consumption spending as an index of government size and covering 130 countries from 1960-85, Lin (1994) used cross-country single and simultaneous equation models to find government size had a positive impact on economic growth in the short run, but not in the intermediate one (25 years in his study).

Ram (1986) used cross-sectional as well as time-series data on 115 developed and developing countries employing a two-sector, government and nongovernment, production function framework based on Feder’s (1982) paper. He found a positive and highly significant relationship between government size and economic growth. Ram’s (1989) later analysis resulted in a similar outcome. Employing the Denison growth accounting approach on cross-sectional data of 42 developing countries, Diamond (1989) found a positive, but insignificant, relationship between the economic growth rate and the overall size of government, measured by the ratio of total government expenditures to GDP. When the structure of these expenditures was examined, he concluded social government expenditures on housing, health, and welfare exerted a positive significant effect on growth in the short run, while capital infrastructure expenditure had little influence on growth. On the other hand, he concluded that directly productive capital expenditure exerted a negative influence on economic growth.

Landau (1983) used cross-sectional data covering 96 countries and found that government size, measured by the share of government consumption to GDP, made a negative contribution to economic growth. In a more comprehensive and detailed study, Landau (1986) found consistent results. He used pooled cross-section and time-series data on 65 developing countries from 1960-
When the government expenditure was categorized, he found that government capital expenditure was slightly harmful to economic growth.

Barro (1989) employed an endogenous growth model on cross-sectional data covering 98 countries from 1960-85, finding the size of government, proxied by the ratio of government consumption spending, excluding defense and education, to GDP has a negative impact on the economic growth. Barro (1991) employed an endogenous growth model on cross-sectional data covering 72 countries from 1960-85, finding the size of government, measured by the ratio of government consumption spending, excluding defense and education, to GDP has a negative impact not only on the economic growth but also on the investment ratio, i.e., the ratio of public and private investment to GDP.

Grier and Tullock (1989) employed pooled cross-section data on 113 countries over the period 1950-81, and found a negative correlation between government size, measured by government consumption expenditures to GDP, and the rate of economic growth. In a sample of 107 countries during the period from 1970-85, Engen and Skinner (1992) used a generalized production function approach assuming a two-sector model, taxed and untaxed, economy. They found government spending and taxation were negatively associated with economic growth. Using a sample of 79 developed and developing countries, Sachs and Warner (1995) found a negative relationship between the growth rate and the ratio of real government consumption spending, net of military and education spending, to real GDP.

Miller (1996) employed data on 22 OCED countries from 1960-88 using time-series and pooled cross-section models and found the share of real government public expenditures in GDP may not affect the real economic growth, while the increase in this share may have a negative impact on the rate of economic growth. Employing a fixed effect model on a sample of 59
middle-income developing countries over the period 1960-85, Guseh (1997) found a negative relationship between the government size, indexed by the share of government consumption expenditure in GDP, and the rate of economic growth.

Easterly and Rebelo (1993) followed Barro’s (1991) cross-country regression and reported a negative relationship between the growth rate and the government size, measured as the ratio of tax revenue to GDP. However, they indicated this result was fragile. In their study of sensitivity analysis of cross-country growth regressions, Levine and Renelt (1992) employed different scenarios to investigate the relationship between government size and the rate of economic growth. First, they used cross-sectional data on 64 countries and found a negative relationship between the ratio of government consumption expenditures to GDP and growth rate. Second, they used total government expenditures to GDP. Third, they used government consumption share minus defense and educational expenditures. Finally, they used central government surplus/deficit to GDP. All the results were negative, albeit not robust. Using a model based on conventional demand theory framework and using time-series data on 20 African countries from 1960-85, Bairam (1990) argued whether the size of government, indexed by the size of total government expenditure, has positive or negative effects on economic growth is country specific and therefore cannot be generalized.

4. East Asian Miracle and Government Intervention

One of the most controversial issues in the economic literature on economic growth and the role of government in the economic activities centers on what is known as the East Asian Miracle. Eight east Asian countries, including China, Japan, Hong Kong, Singapore, Indonesia, Malaysia, South Korea, Thailand, and Taiwan, recorded a spectacular rate of rapid and sustained
economic growth over the last three decades. These high-performing Asian economies (HPAE) outperformed the OECD economies.

The high rates of sustained economic growth in these countries cast more doubt on the validity of the neoclassical growth theory. This theory is based on the exogeniety of the saving ratio and population growth and it assumes diminishing marginal productivity of inputs. Furthermore, it is assumed that technology, which is exogenous, is the only factor to account for economic growth. Given these assumptions, the theory predicts the developing countries will achieve higher rates of economic growth than developed countries for a certain period of time. Due to the assumed diminishing returns, however, the rates of economic growth in the developing countries are expected to converge to a steady state.

In the case of the East Asian Miracle, the convergence expected in the neoclassical theory did not exist. The celebrated work of Romer (1986) and Lucas (1988) introduced what is known as endogenous growth theory. This theory assumes that technological change is endogenous and emphasizes the importance of human capital and the accumulation of knowledge as important factors in the economic growth process. These factors are not subject to a diminishing return to scale, and the convergence, as the theory argues, is not necessary and the rates of economic growth are related over time.

There is no consensus among the economists about the determinants of high economic growth in the HPAE. An array of explanations has been introduced including cultural, religious, regional, and economic factors. Nonetheless, the range and the effect of government interventions with respect to this outstanding performance has not been settled yet. The governed market theory, which is sometimes called the structuralist or revisionist school (e.g., Wade, 1990), argues this experience lends support to the state-led growth policies and emphasizes the
importance of government intervention in achieving high rates of economic growth. Not only this, but this theory argues the governments in these countries deliberately got the prices wrong to affect the incentive system in favor of the industrial sector.

Free market theory (e.g., Chen, 1979), which is imbued with the principles of the neoclassical theory, argues the state intervention in the HPAE was largely absent and the startling performance of these economies was based on a market-led environment. There is also a group of economists who argue that government intervention in these countries had negative impacts on economic growth, which could have been larger in the absence of government intervention (see Krueger, 1995).

Furthermore, there is a simulated free market theory or market friendly theory (e.g., World Bank, 1991; 1993) which recognizes the government intervention and believes this intervention was wider than the creation of the suitable growth environment. This theory argues the governments in these countries were simulating the free market.

The World Bank (1993) acknowledges the importance of the systematic government intervention in these economies while emphasizing that these economies got the fundamentals right. These fundamentals include low level of inflation, realistic exchange rates, building human capital by giving much attention to the educational and training systems, creating effective and secure financial systems, implementing successful technological catch-up, limiting the price distortions, and limiting the bias against the agricultural sector. These economies adopted outward-oriented policies, achieved egalitarian distribution of income, and encouraged or forced high levels of domestic saving, which led to high levels of domestic investments.
5. Theoretical Modeling

As indicated earlier, the vast majority of empirical studies used cross-country models to investigate the effect of government size on economic growth. However, these models suffer from the following shortcomings. First, different countries have different specific effects. Nonetheless, cross-country models ignore this fact and treat all countries as having the same characteristics. If the country-specific effects are correlated with the explanatory variables, there will be what is known as the omitted variable bias. Second, some variables might be time variant, but the time factor is ignored in cross-country models. Third, cross-section data provide few observations, which negatively affects the efficiency of econometric estimates. Because of the aforementioned shortcomings, the validity of cross-country studies is cast in doubt. In addition, Levine and Zervos (1993, pp. 426-427) argue that “cross-country regressions should be viewed as evaluating the strength of partial correlation and not as behavioral relationship that suggest how much growth will change when policies change.”

Panel data models avoid these shortcomings for the following reasons. First, they accommodate across-country and across-time differences. Second, they provide a large number of data points, which increases the degrees of freedom and improves the efficiency of the econometric estimates by reducing the collinearity among the explanatory variables. Therefore, in our study, we employ the following theoretical econometric model using panel data to investigate the relationship between the government size and the rate of growth of per capita income:

\[ Y_{it} = \beta_1 X_{it,1} + \beta_2 X_{it,2} + \ldots + \beta_k X_{it,k} + \epsilon_{it} \quad (I = 1,2,\ldots,N; \; t = 1,2,\ldots,T). \]
That is, the sample data are represented by observations on $N$ cross-section units over $T$ time periods. $Y_{it}$ is the independent variable for the $ith$ country in the $tth$ time period. $X_{it}$ are explanatory variables, $B$s are parameters to be estimated, and $\varepsilon_i$ is the stochastic disturbance.

In the classical linear regression model (CLRM), it is assumed the error term, which includes the effect of unobserved variables, is independently distributed from the explanatory variables. However, in the case of panel data, the omitted variables can be classified into three groups: (1) time-varying country-invariant, (2) country-varying time-invariant, and (3) country and time-varying variables. If these variables are correlated with the explanatory variables, the CLRM estimation yields biased estimates of $\beta$s.

Therefore, when panel data are employed, equation 1 can be estimated employing two different approaches, depending on whether the unobserved effects are assumed to be correlated or uncorrelated with the explanatory variables included in the model. These approaches are incorporated in the fixed effect model and the random effect model.

**Fixed Effect Mode**

This approach assumes individual effects are fixed in nature (Islam, 1995) and uncorrelated with the error term and are treated as fixed parameters. If the problem is that the omitted time-varying or country-varying variables are correlated with the error term, the problem can be solved by adjusting the dependent and independent variables through transformation from individual means. Using this approach, equation 1 can be written as follows:

$$Y_{it} = \theta_i D_{i,1} + \theta_{i,2} D_{i,2} + \ldots + \beta_1 X_{it,1} + \beta_{i,2} X_{it,2} + \ldots + \beta_k X_{it,k} + \varepsilon_i$$

where $\theta_i$'s are individual specific constants, $D_i$'s are group dummy variables, and $\varepsilon$ is the classical stochastic disturbance with mean zero and variance $\sigma^2_{\varepsilon}$.
This model is estimated by using the least square dummy variable (LSDV) method and is based on the assumption that only the intercept parameter varies and this variation occurs across countries, but not over time. Hence all behavior differences between individual countries and over time are captured by the intercept (Griffiths et al., 1993). Therefore, Equation 2 can be simplified as follows:

\[ Y_{it} = \theta + \beta_1 X_{it,1} + \beta_2 X_{it,2} + \ldots + \beta_k X_{it,k} + \varepsilon_{it} \]  

(3)

However, this model is not without caveats. First of all, if the employed sample is drawn from a large population, it is unreasonable to assume that differences between countries are nothing but parametric shifts. Second, the estimation results of this model cannot be generalized on countries out of the sample. Third, in case of correlation of both time-varying country-varying effects with the explanatory variables, this model cannot be estimated.

Random Effect Model

As mentioned earlier, the fixed effect model cannot be used when the omitted variables are time and country-varying. In this case the random effect model is the appropriate method. This model is suitable when the countries included in the sample have been chosen randomly to represent larger population. Consequently, this model deals with the individual effects as random variables. The error term has three components, time-specific effect \( (w_i) \), country-specific effect \( (v_i) \), and time and country-specific effect \( (\mu_{it}) \). These effects are assumed to be independent of the regressors. The error term can be written as follows (Kmenta, 1986; Greene, 1992; Miller, 1996; Miller and Russek, 1997):

\[ \varepsilon_{it} = v_i + w_i + \mu_{it} \quad (i=1,2,\ldots,N; \; t=1,2,\ldots,T) \]  

(4)
Further, it is assumed the error term has the following properties (Kmenta, 1986; Greene, 1992; Miller, 1996; Miller and Russek, 1997):

\[ E(v_i) = E(w_i) = E(\mu_{it}) = 0 \]

\[ E(v_i w_i) = E(v_i \mu_{it}) = E(w_i \mu_{it}) = 0 \]

\[ E(v_i v_j) = \sigma_v^2, \quad \forall \ i \neq j ; \ 0 \text{ otherwise} \]

\[ E(w_i w_s) = \sigma_u^2, \quad \forall \ t \neq s ; \ 0 \text{ otherwise} \]

\[ E(\mu_{it} \mu_{js}) = \sigma_\mu^2, \quad \forall \ i = j \text{ and } t = s ; \ 0 \text{ otherwise} \] (5)

These implications imply \( \varepsilon_{it} \) is homoscedastic with the following variance:

\[ \sigma^2 = \sigma_v^2 + \sigma_u^2 + \sigma_\mu^2 \] (6)

Substituting equation 4 into equation 1:

\[ Y_{it} = \beta_1 X_{it,1} + \beta_2 X_{it,2} + \ldots + \beta_k X_{it,k} + v_i + w_i + \mu_{it} \] (7)

If the components of the error term are known, this model can be estimated using generalized least square (GLS). However, if these components are unknown, the model should be estimated using feasible generalized least square (FGLS).

6. Data Set and Empirical Estimation

The Data Set

The study employs a panel data set of 30 developing countries over the period 1970-90. Of these countries, 15 are low-income countries and 15 are middle-income countries. The countries were classified based on the World Bank classification by level of income in 1992-93. The countries included in the study are listed in table 1. Figure 1 shows the secular growth of government size in these countries, measured by government consumption to GDP, over the
study period. It is apparent that government size recorded sustained growth during the last three decades.


As mentioned earlier, the economic theory does not provide a clear framework to estimate the relationship between government size and economic growth and there is no consensus among the economists about a given framework to investigate this issue. Different approaches and various sets of dependent and explanatory variables have been employed in the existing empirical literature without proving the superiority of a particular one over the others. Levine and Renelt (1992, p. 942) indicated "that over 50 variables have been found significantly correlated with growth in at least one regression."

Based on what can be deduced from the economic theory and the existing empirical literature, our empirical model will have the following *ad hoc* formulation:

\[ y_{it} = \alpha_i + \beta \text{Govt}_{it} + \delta \text{Inv}_{it} + \gamma \text{Opn}_{it} + \lambda \text{Pop}_{it} + \phi \text{CAD}_{it} + \theta \text{ExtD}_{it} + \varepsilon_{it} \]  

(8)

where \( y \) is the growth rate of per capita income, \( \text{Govt} \) is the size of government proxied by the share of government consumption expenditures in GDP, \( \text{Inv} \) is the investment share, public plus private investment, of GDP, \( \text{Opn} \) is an indicator of the economy openness measured by the ratio of exports plus imports to GDP, \( \text{Pop} \) is the annual growth rate of population, \( \text{CAD} \) is the ratio of current account deficit, before official transfers, to GDP, and \( \text{ExtD} \) is the ratio of total external debt, private and public, to GDP. \( \alpha, \beta, \delta, \gamma, \lambda, \phi, \) and \( \theta \) are coefficients to be estimated and \( \varepsilon \) is the stochastic disturbance term.
Set of Hypotheses

Through the estimation of this model, the following hypotheses will be tested: Hypothesis 1: There is a negative relationship between government size and economic growth, i.e., $\beta$ has a negative sign. This hypothesized relationship is attributed to the inefficiency of the public sector, the crowding out effect of government expenditure, the price distortion because of government policies, and the deterioration in saving rates as a result of government budget deficits.

Hypothesis 2: Public and private investment exerts positive influence on economic growth, i.e., the predicted sign of $\delta$ is positive. This is attributed to the investment role in capital accumulation which is vital for economic growth. It is noteworthy here that Levine and Renelt (1992) indicated that the investment rate was found to be one of the most robust variables in the economic growth empirics.

Hypothesis 3: The open economies experience a high and positive rate of economic growth, i.e., the hypothesized sign of $\gamma$ is positive. The positive sign is due to the effect of trade openness on specialization, efficient resource allocation, economies of scale, and technological improvement.

Hypothesis 4: There is not an a priori relationship between the rate of economic growth and population growth rate, i.e., the sign of $\lambda$ is unknown. The difficulty in predicting this sign has theoretical, as well as empirical roots. In the neoclassical growth theory there should be one-for-one effect of population growth on rate of economic growth if all countries are in a steady state of economic growth (Kormendi and Meguire, 1985). However, we do not have any prediction about the stage of the steady state in our sample of developing countries. Moreover, no significant correlation was found between the two variables over the last century in those countries now considered as developed (Simon, 1976).
Hypothesis 5: There is a negative relationship between the current account deficit and economic growth, i.e., $\phi$ has a negative sign. This is attributed to the negative contribution of this deficit to the country foreign reserve, budget deficit, and vulnerability to the external shocks.

Hypothesis 6: The higher the ratio of external debt to GDP, the lower the level of economic growth, i.e., the sign of $\omega$ is hypothesized to be negative. This is due to the effects of the external debt on exchange rate, state independence, and capital outflows.

Of course these hypotheses will be tested against the simple null hypothesis that no relationship exists between economic growth and each one of these macroeconomic variables.

The Empirical Estimation

First of all, we have conducted different specification tests to choose the most plausible model for our empirical estimation. The F-test was performed to compare the performance of the fixed effect model versus the OLS model, which is the null hypothesis. The Lagrange multiplier (LM) test was conducted to test the random effect model against the OLS model, which is the null hypothesis. The Wald test was performed to compare the performance of the fixed effect model against the random effect model, which is the null hypothesis.

The result of the F-test was in favor of the fixed effect model. Moreover, the LM test led to rejection of the random effect model, and the Wald test indicated the superiority of the fixed effect model against the random effect model. Therefore, the fixed effect model dominates the random effect model and the OLS model. However, the empirical results of the OLS, random effect, and fixed effect models are presented in table 2.

It is evident the coefficient of the government size variable is negative and statistically significant at less than 5% level of significance. This purports that the larger the government size, the lower the rate of economic growth. Figure 2 plots the economic growth rate against the
government size for the whole sample. Apparently the simple correlation between the two variables is strongly negative.

The empirical results indicate there is a negative relationship between the economic growth rate and the current account deficit. However, this relationship is insignificantly different from zero. Figure 3, which shows the simple correlation between the current account deficit and the rate of economic growth, reflects an ambiguous relationship. It seems our hypothesis regarding the negative relationship between the ratio of external debt to GDP is not supported by the empirical estimation. The coefficient of the external debt ratio to GDP is negative but statistically insignificant. Furthermore, figure 4, which shows the simple correlation between the two variables, reveals the absence of any clear cut relationship between the two variables.

As indicated earlier, the investment rate was found to be one of the most robust variables of the economic growth empirics. This has been confirmed in our study, which shows a highly significant positive relationship between the rate of investment and the rate of economic growth. The strongly positive simple correlation between the two variables, as shown in figure 5, supports this result. The influence of trade openness on economic growth is found to be positive, but statistically insignificant. Nonetheless, figure 6 purports a positive simple correlation between the two variables. Lastly, the population growth is found to exert a negative and highly significant influence on the rate of economic growth. The coefficient of this variable is negative and statistically significant at less than 1% level of significance. In addition to that, when the two variables are plotted against each other in figure 7, the negative simple correlation between the two variables is vividly captured. This negative relationship can be attributed to different factors such as the increase in the dependency ratio and the trade off between the quality and quantity of human capital.
7. Conclusions

In this essay, we have employed a panel data approach to investigate the relationship between government size and economic performance in terms of economic growth. Different specification tests have been conducted to choose the most appropriate model for our empirical investigation. The fixed effect model proved to be the most plausible one. The results of this model lend support to the argument that the larger the government size, the worse the economic performance.


Table 1. Developing countries included in the study

<table>
<thead>
<tr>
<th>Country</th>
<th>Country Code</th>
<th>Country Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Income Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>BGD</td>
<td>Asia</td>
</tr>
<tr>
<td>Benin</td>
<td>BEN</td>
<td>Africa</td>
</tr>
<tr>
<td>China</td>
<td>CHN</td>
<td>Asia</td>
</tr>
<tr>
<td>Egypt</td>
<td>EGY</td>
<td>Africa</td>
</tr>
<tr>
<td>Ghana</td>
<td>GHA</td>
<td>Africa</td>
</tr>
<tr>
<td>Honduras</td>
<td>HND</td>
<td>Central America</td>
</tr>
<tr>
<td>India</td>
<td>IND</td>
<td>Asia</td>
</tr>
<tr>
<td>Indonesia</td>
<td>IDN</td>
<td>Asia</td>
</tr>
<tr>
<td>Kenya</td>
<td>KEN</td>
<td>Africa</td>
</tr>
<tr>
<td>Lesotho</td>
<td>LSO</td>
<td>Africa</td>
</tr>
<tr>
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<td>MLI</td>
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<td>NGA</td>
<td>Africa</td>
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<td>Pakistan</td>
<td>PAK</td>
<td>Asia</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>LKA</td>
<td>Asia</td>
</tr>
<tr>
<td><strong>Middle Income Group</strong></td>
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<td></td>
</tr>
<tr>
<td>Algeria</td>
<td>DZA</td>
<td>Africa</td>
</tr>
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<td>Brazil</td>
<td>BRA</td>
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<td>--------------------</td>
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<td>TTO</td>
<td>Central America</td>
</tr>
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<td>Turkey</td>
<td>TUR</td>
<td>Europe</td>
</tr>
<tr>
<td>Uruguay</td>
<td>URY</td>
<td>South America</td>
</tr>
</tbody>
</table>

1 Country codes are based on Heston and Summers (1995).
Table 2. Parameter estimates of the growth equation from the pooled sample, 1970-90

<table>
<thead>
<tr>
<th>Variable</th>
<th>OLS</th>
<th>Fixed effect</th>
<th>Random effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.00124</td>
<td>0.06231</td>
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</tr>
<tr>
<td></td>
<td>(-2.511)</td>
<td>(3.890)</td>
<td></td>
</tr>
<tr>
<td>Govt</td>
<td>-0.00015</td>
<td>-0.00454</td>
<td>-0.00158</td>
</tr>
<tr>
<td></td>
<td>(-0.336)</td>
<td>(-5.512)</td>
<td>(-2.955)</td>
</tr>
<tr>
<td>Cad</td>
<td>0.00002</td>
<td>-0.00025</td>
<td>-0.00010</td>
</tr>
<tr>
<td></td>
<td>(0.149)</td>
<td>(-0.477)</td>
<td>(-0.217)</td>
</tr>
<tr>
<td>Extd</td>
<td>0.00095</td>
<td>-0.00003</td>
<td>0.00002</td>
</tr>
<tr>
<td></td>
<td>(2.083)</td>
<td>(-0.205)</td>
<td>(0.139)</td>
</tr>
<tr>
<td>Inv</td>
<td>0.00005</td>
<td>0.00210</td>
<td>0.00089</td>
</tr>
<tr>
<td></td>
<td>(0.435)</td>
<td>(2.591)</td>
<td>(1.827)</td>
</tr>
<tr>
<td>Opn</td>
<td>-1.07380</td>
<td>0.00017</td>
<td>0.00006</td>
</tr>
<tr>
<td></td>
<td>(-4.032)</td>
<td>(0.624)</td>
<td>(0.520)</td>
</tr>
<tr>
<td>Pop</td>
<td>-1.48420</td>
<td>-1.13338</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-4.450)</td>
<td>(-4.092)</td>
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</tr>
<tr>
<td>F-test</td>
<td>1.87</td>
<td></td>
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</tr>
<tr>
<td>LM test</td>
<td></td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Wald test</td>
<td></td>
<td>28.48</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.06</td>
<td>0.14</td>
<td>0.06</td>
</tr>
</tbody>
</table>

*Figures in parentheses are asymptotic t-ratios for the corresponding coefficients.
Fig. 1. Government growth for 30 developing countries, 1960-90

Fig. 2. Economic growth vs. government size, 1970-90
Fig. 3. Economic growth vs. current account deficit, 1970-90

Fig. 4. Economic growth vs. external debt, 1970-1990
Fig. 5. Economic growth vs. investment rate, 1970-90

Fig 6. Economic growth vs. trade openness, 1970-90
Fig. 7. Economic growth vs. population growth, 1970-90
Appendix

Wagner’s Law

Consider an economy of two sectors, i.e., government and nongovernment sectors, respectively. The utility function for a representative consumer in this economy can be written as follows:

\[ U = U(G, NG) \]  
\[ \text{Max } U = U(G, NG) \]  
Subject to:

\[ P_G G + P_{NG} NG = I \]  
where \( I \) is the consumer income

\[ \frac{P_G dG}{dI} + \frac{P_{NG} dNG}{dI} = \frac{dI}{dI} \]  
\[ \frac{P_G G}{I} \times \frac{I}{G} \times \frac{dG}{dI} + \frac{P_{NG} NG}{I} \times \frac{I}{NG} \times \frac{dNG}{dI} = 1 \]

Let \( K_G \) and \( K_{NG} \) denote the share of government and nongovernment in consumer income, respectively.

Let \( \eta_G \) and \( \eta_{NG} \) denote income elasticity of demand for government and nongovernment produced goods and services, respectively. Under the assumption of full employment, the income elasticity of demand for all goods and services produced in the economy is unity (Johnson, 1973). Therefore, equation A6 can be written as follows:

\[ K_G \eta_G + K_{NG} \eta_{NG} = 1 \]
This equation implies that the weighted average of income elasticities is equal to 1.

\[ \frac{dK_G}{dl} = \left( \frac{P_G}{I} \right) \frac{dG}{dl} \]

Therefore, if \( \eta_G > 1 \), then \( \frac{dK_G}{dl} > 0 \) (A8)

\[ \frac{dK_G}{dl} = \frac{d}{dl} \left( \frac{P_G G}{I} \right) \]

(A9)

\[ P_G \frac{dG}{dl} \frac{I - P_G G}{I^2} \]

(A10)

\[ = P_G \frac{dG}{dl} \times \frac{I}{G} - P_G G \]

(A11)

\[ = P_G \frac{G(\eta_G - 1)}{I^2} \]

(A12)

Therefore, if \( \eta_G > 1 \), then \( \frac{dK_G}{dl} > 0 \)

Baumol’s Effect

Let us consider an economy with two sectors, i.e., government sector and nongovernment sector. Figures A1 and A2 represent the demand for and supply of government and nongovernment goods and services, respectively. Since the numeraires are chosen arbitrarily, it is assumed that \( P_G = P_{NG} = 1 \).

If the income elasticity of demand for government produced goods and services, i.e., \( \eta_G \), is greater than unity, the income elasticity of demand for nongovernment produced goods and services, i.e., \( \eta_{NG} \), should be less than unity. Therefore, if real per capita income increased, the \( D_G \) will shift to the right more than \( D_{NG} \) as portrayed in figures A1 and A2, respectively. Given the assumption that the government sector is less capital intensive than the nongovernment one, the supply function for the former will shift to the right less than that of the latter as shown in
figures A1 and A2, respectively. The net result will be an increase in the price of government produced goods and services from \( P_G \) to \( P_G^1 \) and a decrease in the price of nongovernment produced goods and services from \( P_{NG} \) to \( P_{NG}^1 \).

Proof:

\[ P_G + P_{NG} = I \]  \hspace{1cm} (A14)

Let \( \omega \) and \( r \) denote the price of labor and capital, respectively,

\[ P_G = a_{L,G} \omega + a_{L,G} r \]  \hspace{1cm} (A15)

\[ P_{NG} = a_{L,NG} \omega + a_{L,NG} r \]  \hspace{1cm} (A16)

Let \( \theta_i \) (\( i = L, K \)) denote the share of input i in producing a dollar worth of goods and services,

\[ \hat{P}_G = \theta_{L,G} \hat{\omega} + \theta_{K,G} \hat{r} \]  \hspace{1cm} (A17)

\[ \hat{P}_{NG} = \theta_{L,NG} \hat{\omega} + \theta_{K,NG} \hat{r} \]  \hspace{1cm} (A18)

As assumed in this hypothesis \( \theta_{L,G} > \theta_{L,NG} \) and \( \theta_{K,G} < \theta_{K,NG} \)

Assume now that \( \hat{r} = 0 \), from equations A17 and A18

\[ \frac{\hat{P}_G}{\hat{P}_{NG}} = \frac{\theta_{L,G}}{\theta_{L,NG}} \]  \hspace{1cm} (A19)

But

\[ \theta_{L,G} > \theta_{L,NG} \]  \hspace{1cm} (A20)

From equation A19:

\[ \frac{\hat{P}_G}{\hat{P}_{NG}} > 1 \]  \hspace{1cm} (A21)