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Abstract

Empirical results through a fixed effects regression model show that government size has a negative effect on growth mainly through hampering capital accumulation. When a sample is divided into OECD and non-OECD countries, the negative effect of government size on capital accumulation persists for non-OECD countries but not for OECD countries.

Keywords: Government size, Efficiency improvement, Capital accumulation, Fixed effects

JEL classification: H11, O43

1. Introduction

Government failure is thought to have a negative effect on economic growth. If resources were allocated less efficiently by larger governments, economic growth would be hindered. This conjecture is supported by several existing works (e.g., Landau, 1985; Peden & Bradley, 1989; Fölster & Herekson, 2001). On the other hand, some studies do not find an obvious association between government size and economic growth (e.g., Ram, 1986; Bairam, 1990; Easterly and Rebelo, 1993; Mendoza et al., 1997). There is also argument that the relationship between government size and growth is non-linear (Barro 1997; Grossman, 1988; Chen & Lee, 2005). However, government size influences growth through some channels, but previous studies pay little attention to it. For closer examination, it is necessary to examine through which channels government size affects growth.

To analyze the channels of economic growth Kumar and Russell (2002) used data envelopment analysis (hereafter, DEA) to construct the world production frontier and decomposed labor-productivity growth into three components: technological catch-up, capital deepening, and technological change. Furthermore, through regression analysis, they examined how the initial output per worker affects these components. In that study, it was found that capital accumulation contributed the most to growth, rather than technological change or catch-up.

This paper aims to improve the above method and apply it to an investigation of the influence of government size on growth in an attempt to produce new empirical evidence[1]. The main findings of the estimation indicate that government size hampers economic growth mainly by impeding capital accumulation in developing but not in

[1] Yamamura and Shin (2008) applied the same method to analyze the long-term economic growth in Japan.

developed countries.

2. Data and Model

By using DEA, Kumar and Russell (2002) constructed a cross-country data set by decomposing labor-productivity growth into three components. They conducted a simple OLS regression model where the independent variables were the output per worker in 1965; while the dependent variables were the percentage change between 1965 and 1990 for output per worker, technological change, the efficiency index, and the capital accumulation index. In their estimation, unobservable individual and time effects were ignored. This leads to estimation bias.

Following Kumar and Russell (2002), this paper uses DEA to construct a panel dataset spanning the years 1965 to 1990 for 57 countries[2]. Second, using this dataset I use fixed effects estimation to reduce omitted variable bias caused by time invariant features of the country. I also incorporate year dummies into this model to capture individually invariant time specific effects[3]. The estimated function takes the following form:

$$Gr_{iT\text{-}to} = \alpha_1 \mathrm{Ln}(Output)_{it0} + \mathrm{Ln}(Government\ size)_{it0} + \mathrm{Ln}(Openness)_{it0} + \varepsilon_i + \nu_t + u_{it},$$

where $Gr_{iT\text{-}to}$ represents labor-productivity growth and the change in any of the three dependent variables (i.e., *Efficiency, capital,* and *Technique*) in country i from each base year t0 to year T (t0 = 1965, …, 1989 and T = 1966, …, 1990, respectively). α's represent regression parameters, ε is the time-invariant individual effect of each country, ν

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[2] Kumar and Russell (2002) admitted that their method includes the possibility of an implosion of the technological frontier. Henderson and Russell (2005) precluded an implosion of the frontier over time. In this paper, it is also precluded.

[3] This estimator is identical to that of a two-way fixed effects estimator (Baltagi, 2005; Ch. 3).

represents the year specific effects, and u is an error term. As stated earlier, ε and ν are controlled. All independent variables are the values in the base year t0 and take log-form. I incorporate the level of the per capita GDP in t0 to control the initial level of productivity. Openness is measured by exports plus imports divided by GDP (the total trade as a percentage of GDP). These data are collected from the Penn World Table (pwt 6.3) [4]. Government size is measured by general government final consumption expenditure (% of GDP) gathered from the World Bank (2006)[5].

3. Results

The estimation results of the fixed effects model with year dummy variables from 1966 to 1990 are reported in Table 1, Table 2 and Table 3. All countries are included in Table 1. OECD and non-OECD samples are used in the estimations found in Tables 2 and 3. In each table, the results of the dependent variables of output per capita change are shown in column (1). The results of the efficiency change, capital accumulation, and technological progress are exhibited in columns (2), (3) and (4)[6].

Table 1 shows that government size takes a significant negative sign in columns (1) and (3). This shows that government size hinders economic growth mainly through hampering capital accumulation. On the other hand, openness values are positive and are statistically significant at the 1% level in columns (1), (2) and (4). Hence, the degree

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[4] The data are available from Center of International Comparisons at the University of Pennsylvania. http://pwt.econ.upenn.edu/ (accessed May 1, 2007).

[5] Other key variables such as social trust, corruption, and human capital determine the dependent variables. If these variables are included, observations are excluded from the sample because I cannot obtain these variables from some countries. Hence, I do not incorporate these variables from the sample in order to maintain a large sample size.

[6] Yamamura and Shin (2007) used the same data set to conduct the same estimation method even though government size and openness were not included as independent variables. The results for per capita GDP are almost the same as those exhibited in Yamamura and Shin (2007).

of international trade leads to economic growth through efficiency improvement and progress of technology. Turning to Table 2, both government size and openness are positive but statistically insignificant in column (1), suggesting that they do not influence the economic growth in the developed countries such as OECD member countries.

Contrary to the results for OECD countries, the results for non-OECD countries in Table 3 show that the coefficient of government size is significantly negative and the coefficient of openness is significantly positive in column (1). Furthermore, it is interesting to observe that government size is negative and is statistically significant at the 1% level in column (3) and that openness is positive and is significant at the 1% level in column (2). From Table 3, I conclude that openness improves efficiency and hence becomes an engine of economic growth. On the other hand, government size impedes capital accumulation and therefore hampers economic growth in non-OECD countries.

I interpret the evidence presented above to mean that increase in the government sector crowds out private investment, resulting in a reduction of capital accumulation. This tendency is especially noticeable in developing countries, but not in developed countries. This might be because people can more easily access official information such as government expenditure in developed countries than they can in developing countries. As a result of this information asymmetry, governments of developing countries can easily manipulate information concerning their expenditure. Accordingly, effective investment by the private sector would be crowded out.

4. Conclusions

This study uses panel data from 57 countries during the period 1965-1989 to examine how government size influences economic growth, and decomposes the effect of government size. Using a fixed effects regression model with year dummies, I found that government size has a negative effect on growth, mainly through hampering capital accumulation. But when considering OECD and non-OECD countries separately, the negative effect of government size on capital accumulation persists for non-OECD countries but not for OECD countries. I infer that the public sector crowds out private sector investment for developing countries and economic growth is thereby impeded.

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Table 1 Fixed effects estimates for all countries (1965-1989).

	Growth (1)	*Efficiency improvement* (2)	*Capital accumulation* (3)	*Technological progress* (4)
Ln(Output)	-0.069*** (-6.48)-	-0.08*** (-8.28)-	0.018*** (5.51)-	0.002 (0.86)-
Ln(Government size)	-0.020** (-2.30)	-0.004 (-0.52)	-0.012*** (-4.52)	-0.003 (-1.30)
Ln(Openness)	0.047*** (6.26)	0.03*** (5.28)	0.001 (0.79)	0.005*** (2.61)
Groups	57	57	57	57
Samples	1362	1362	1362	1362

Note: Not reported here, year dummies are included in all estimations as independent variables. Numbers in parentheses are *t*-statistics. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Table 2 Fixed effects estimates for OECD countries (1965-1989).

	Growth (1)	*Efficiency improvement* (2)	*Capital accumulation* (3)	*Technological progress* (4)
Ln(Output)	-0.103*** (-6.92)-	-0.045*** (-2.96)-	-0.027*** (-5.85)-	-0.027*** (-5.37)-
Ln(Government size)	0.002 (0.13)	0.004 (0.31)	-0.002 (-0.44)	-0.001 (-0.24)
Ln(Openness)	0.015 (1.32)	0.057*** (4.86)	-0.040*** (-11.3)	-0.001 (-0.43)
Groups	24	24	24	24
Samples	585	585	585	585

Note: Not reported here, year dummies are included in all estimations as independent variables. Numbers in parentheses are *t*-statistics. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Table 3 Fixed effects estimates for non-OECD countries (1965-1989).

	Growth (1)	*Efficiency improvement* (2)	*Capital accumulation* (3)	*Technological progress* (4)
Ln(Output)	-0.067*** (-4.57)-	-0.093*** (-6.37)-	0.022*** (5.23)	0.005 (1.60)-
Ln(Government size)	-0.029** (-2.45)	-0.003 (-0.31)	-0.017*** (-5.22)	-0.007** (-2.48)
Ln(Openness)	0.043*** (3.83)	0.042*** (3.75)	0.001 (0.38)	-0.0007 (-0.29)
Groups	57	57	57	57
Samples	1362	1362	1362	1362

Note: Not reported here, year dummies are included in all estimations as independent variables. Numbers in parentheses are *t*-statistics. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.