THE EFFECT OF GOVERNMENT SIZE ON ECONOMIC GROWTH

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INTRODUCTION

In recent years, there has been a renewed interest in studying the determinants of economic growth [Kormendi and Meguire, 1984; Grier and Tullock, 1989; Barro, 1989; 1991]. A major question posed in these studies is whether the relative share of government expenditures in gross domestic product (GDP) has an impact on growth. While empirical studies do not consistently find either a positive or a negative impact, they generally limit themselves to testing for a monotonic relationship. This paper focuses on an aspect of this question that is developed in the theoretical literature but has not yet been explored in empirical studies, namely, that the net impact of government on growth may initially be positive and then weaken or become negative beyond some threshold of government size or level of development. In the privatization literature, for example, while the impact of providing basic public services is positive at first, it diminishes and gradually becomes negative as government expenditures rise and become closer and closer substitutes for private expenditures.[1] Similarly, a continuing theme in the development literature is that in poor countries structural barriers and market failure are more pervasive and therefore the scope for government interventions to raise the rate of growth is greater.[2] This study uses cross-country data and a production function framework to test for the impact of changes in relative government size on growth while allowing the relationship to vary in strength or sign with the starting share of government in GDP and the level of development.

METHODOLOGY

Previous empirical studies have readily acknowledged that government has both positive and negative effects on growth. These counterbalancing influences have been taken into account, for the most part, either by acknowledging the possibility that the coefficient measuring the net impact of government on growth may be positive or negative [Landau, 1983; Ram, 1986; Grier and Tullock, 1989] or disaggregating government expenditures into various subcategories, some of which may stimulate (retard) growth more than others [Landau, 1986; Barro, 1989; Diamond, 1989].[3] But an examination of the literature on the links between government and growth suggests that two different criteria, the relative size of government and the level of development, may be used to distinguish between those countries in which the positive effects dominate and those in which the negative ones are more powerful.

Much of the recent theoretical literature on this topic describes a non-linear relationship that is positive when the share of government in economic activity is low, but changes sign as the relative size of government grows. This reversal of sign is evident in the public choice and privatization literature.[4] Here government contributes to economic growth by providing basic public goods, including a stable framework of law and security. However, as government expands its scope, the likelihood that its activities may lower economic efficiency grows. Since there are only a limited number of truly public goods that raise the efficiency of the private sector, additional government programs will mean more and more expenditure decisions made by elected officials and public employees with less incentive to act efficiently than private, profit-oriented firms. Further, as government gets larger, rent-seeking activities by special interest groups become potentially more profitable and consequently more widespread which reduces the efficiency with which government goods and services are provided. Higher government expenditures also require increased tax rates, which will reduce work incentives. This same reversal of sign is also postulated in some recent endogenous growth models [Barro, 1989; Easterly, 1990]. In the Barro model, for example, when government is relatively small, growth rises with increases in government services and taxation as the positive effects of more public goods dominate, but beyond some point the harmful effects of higher taxes on savings and investment reduce the growth rate. Below I test for this change in sign by dividing the sample into two parts based on the initial share of government in GDP.

The economic development literature implies another possible division of countries by the impact of government expansion on productivity. Proponents of government intervention argue that various growth-limiting characteristics specific to developing countries call for an expanded role for government to promote growth. These characteristics are usually described as structural inflexibilities and/or instances of market failure and include the problems of infant industries, a higher degree of monopoly and oligopoly power, inadequate information about markets and products, an inability to hedge against the risks of doing business, and low short-run elasticities of supply and demand.[5] However, critics of a development strategy based heavily on intervention to overcome such limitations claim that the evidence shows that developing country markets generally display a strong degree of price elasticity and resource mobility. They argue as well that the overregulation of markets in low income countries has itself slowed growth [Little, 1982, 118-21; Bauer, 1984, 30-31].

In recent years, opinion on developing countries has favored privatization of government-owned enterprises and a reduction in state regulation, policies that could be seen as consistent with a reduction in the relative size of government. But the World Bank's *World Development Report 1991*, while advocating deregulation and privatization where markets can work well, also argues that governments need to do more in areas such as health, education, the environment and physical and administrative infrastructure where markets alone are insufficient. The *Report* calls for a realignment of the roles of state and market in a "market-friendly" development strategy and suggests that the need for public goods is generally larger

in a developing than a developed country and that in many developing countries this need is far from being fully met. Thus both in the traditional literature on structural barriers to development and in the more recent debate on the proper role of government in a market-oriented development strategy, support exists for the contention that increases in government expenditures may lift the rate of growth in less developed countries. Below, using initial real GDP per capita as a proxy for the level of development, I test the hypothesis that increases in the share of government expenditures have a more positive (less negative) impact on growth for countries at a less advanced stage of development.

EMPIRICAL TESTS

Cross-country empirical tests of the impact of government size on growth typically regress the annual rate of growth of real GDP averaged over several years on variables measuring the growth of physical capital, the growth of the labor force and the share of government expenditures. In those studies where the coefficient of the share of government expenditures has been significant, its sign usually has been negative [Levine and Renelt, 1991, 50-52].[6] The measure of government expenditure most often used in these studies and employed below is government consumption. It is the only measure of government economic activity for which data are available in internationally comparable prices. It is important, however, to note that this variable has certain limitations, the most significant of which is that government consumption excludes capital formation, a component of government expenditures often thought to have a positive impact on growth in low income countries. Also, the improvements in health and education that are thought to raise growth in low income countries will not be captured by this measure to the extent that countries choose to finance them privately.

Apart from the division of the sample on the basis of the starting levels of the share of government consumption and per capita GDP, this study differs from most earlier ones by using first differences in averages of the variables between two periods, 1960-70 and 1970-80, rather than averages for a single period. Most of the studies to date are not at all dynamic in that they have only one observation on each variable for each country and therefore reason about changes over time from cross-country variation. First differencing directly tests for the impact of changes in government expenditures on growth rates.

Our test formulation is the same as that used in Saunders [1985] for twenty Organization for Economic Cooperation and Development (OECD) countries between 1960-73 and 1975-81, namely,

$$DY = a_0 + a_1 DIY + a_2 DGY$$

where D indicates the difference in the average value of a variable between 1960-70 and 1970-80; Y is the growth of real GDP; IY is the share of gross domestic

investment in real GDP; and GY is the share of government consumption in real GDP.[7] The data for this study, consisting of 102 countries with a population of over one million in 1960, are from Ram [1986]. Two countries, Angola and Mozambique, which experienced very sharp declines in the growth of GDP in the 1970s for reasons unrelated to the factors under discussion, are excluded here.

The main results are presented in Table 1. The first regression is based on data for the full sample. The negative constant term indicates a downward trend in growth between the 1960s and 1970s, and the size and significance of the positive coefficient of DIY closely conforms with the results of other studies. Despite considerable variation in the value of DGY across countries, its positive coefficient is small and insignificant, implying that on average, changes in the share of government do not affect growth. In regressions 2 and 3, the sample consists of countries for which the share of government in 1960 was less than 15 percent. Regression 4 includes countries where the share was 15 percent or greater.[8] Based on the positive and significant coefficients of DGY in regressions 2 and 3, these results offer support for the contention that when the share of government consumption is low, further increases have a positive impact on GDP growth. In regression 3, when DGY^2 is added, the coefficient of DGY rises in size and significance. The negative coefficient of DGY^2 suggests that for countries with an initially low share of government expenditures, the marginal contribution of the transfer of resources to government consumption between the 1960s and 1970s on growth declined as the transfer increased. For countries where the share of government was initially larger (regression 4), the coefficient of DGY is negative but small and not significantly different from zero. While a Chow test does not reject the hypothesis that the coefficients are the same for these two samples, the positive and significant coefficients of DGY in regressions 2 and 3 suggest future research. Since it was not possible to differentiate between the two regression samples by means of statistical tests, the indentification of a share of 15 percent was done on an *ad hoc* basis.[9]

In regressions 5-7, the sample is divided on the basis of real GDP per capita in 1960. In this case, over a certain range that included the midpoint of the sample, Chow tests do reject the hypothesis that the coefficients are the same in the two sets of countries and the level of real GDP chosen to partition the sample was that which maximized the F statistic in this test.[10] These results suggest that the significantly negative impact of a larger government share is confined to the high income countries. For the low income countries, an expanded government share had a significantly positive effect on growth, although the overall fit of the equation is weak.[11]

The final question raised was how the initial levels of the government share and GDP per capita interact in determining the impact of government size on growth. One would expect, for example, that in those poor developing countries where government is already relatively large, a further increase in government size would not serve as a stimulus to growth. For this test, a set of dummy variables was constructed for the four possible combinations of high and low government size and level of development where the dummy variable is DGY for that set of countries and

TABLE 1
Regression Results

#	CONSTANT	DIY	DGY	DGY²	DGY1	DGY2	DGY3	n	R̄²
Full Sample									
1	-1.14	0.213	0.061					100	0.113
	(3.62)ᵇ	(3.81)ᵇ	(0.92)						
Low Government Share (<15%)									
2	-2.01	0.223	0.282					44	0.217
	(3.74)ᵇ	(2.27)ᵃ	(2.18)ᵃ						
3	-2.38	0.217	0.819	-0.069				44	0.280
	(4.38)ᵇ	(2.31)ᵃ	(2.93)ᵇ	(2.15)ᵃ					
High Government Share (≥15%)									
4	-0.79	0.158	-0.027					56	0.062
	(1.89)	(2.20)ᵃ	(0.32)						
Low Income Countries									
5	-0.59	0.140	0.205					51	0.094
	(1.17)	(1.76)	(2.16)ᵃ						
High Income Countries									
6	-1.60	0.249	-0.195					49	0.367
	(5.34)ᵇ	(4.03)ᵇ	(2.69)ᵇ						
High Income LDCs									
7	-1.10	0.219	-0.261					29	0.455
	(2.17)ᵃ	(2.63)ᵃ	(2.97)ᵇ						
Full Sample									
8	-1.24	0.167			0.510	0.084	-0.231	100	0.304
	(4.40)ᵇ	(3.32)ᵇ			(4.49)ᵇ	(0.93)	(2.58)ᵃ		

Notes: All variables measure differences in average values between 1960-70 and 1970-80. The dependent variable is DY where D indicates a first difference, Y is the rate of growth of real GDP, IY is the share of gross domestic investment in real GDP, and GY is the share of government consumption in real GDP. The figures in parentheses are t statistics. $DGY1$ is a dummy variable for DGY for the low income-low government share countries, $DGY2$ is one for the low income-high government share countries and $DGY3$ is one for the high income countries.
ᵃ Indicates significance at the .05 level. ᵇ Indicates significance at the .01 level.

zero for the other countries. The results already presented would suggest that the impact of a change in government size on growth would be most positive for the low income-low government share countries and most negative for the high income-high income-low government share group. The preliminary results with these dummy variables government share group. The preliminary results with these dummy variables indicated that the coefficient of DGY differed significantly across these groups as expected, except that for the high income countries starting government size did not matter. In regression 8, then, there are only three dummy variables for the change in government size: $DGY1$ for the low income-low share countries, $DGY2$ for the low income-high share countries, and $DGY3$ for all high income countries. A change in the share of government consumption has a significantly positive effect for the low income-low government share countries and a significantly negative one for the high income group. But for the low income countries in which the government share was already high, the coefficient for further expansion is small and insignificant.[12]

While the results in Table 1 suggest the possibility that an expansion of government services can raise the growth rate for some developing countries, the scope for such action appears to be limited. The set of countries in our low income-low government share category is only 16. For most countries that are usually counted as developing, the impact of a further expansion of government consumption is either insignificant or, in the case of those countries that fall into our high income category (regression 7), strongly negative.

CONCLUSION

This study advances and tests the hypothesis that the impact on growth of allocating a larger or smaller share of GDP to government varies with the ratio of government to GDP and with the level of development. This hypothesis is clearly present in the literature on government and growth and finds empirical support in the preliminary results presented here. Should these results hold up to further scrutiny, the implication would be that recent efforts to differentiate between the positive and negative effects of government on growth by considering separate categories of government expenditure may be insufficient. For the broad category used here, government consumption, previous studies have generally found no effect or a negative effect on growth. The results presented above, however, imply a range of different effects from significantly positive to significantly negative, depending on the relative size of the government sector and the level of per capita GDP.

NOTES

1. For references to and a brief summary of this literature, see Barth, Keleher and Russek [1990].
2. This literature is cited and summarized in Hogendorn [1992, 383-423].
3. An exception is Grossman [1990] who argues that the positive effects of government on growth can be captured by the growth rate of government expenditures while the negative effects are related to changes in the relative size of government.
4. The discussion below relies on Barth, Keleher and Russek [148-150].
5. For a more complete list, see Hogendorn [1992, 384-5] and Gillis, Perkins, Roemer and Snodgrass [1992, 102-5].
6. The negative coefficient for the share of government in a regression in which the share of investment is also on the right side lends itself to another interpretation implying no direct relationship between fiscal policy and growth. If changes in the share of investment tend to represent a closer tradeoff with government than with private consumption, then the negative relationship between government share and growth may reflect the positive relationship between investment share and growth. Levine and Renelt [1992], however, found that when they made the investment share the dependent variable, the coefficients on the government share variables were more often positive than negative.
7. In preliminary tests, the change in labor force growth was included as an independent variable but its coefficient was insignificant.
8. The measure of the share of government in 1960 is the share of government consumption in real GDP. The data for this variable and for per capita real GDP in 1960 were taken from Summers and Heston [1984], the source for Ram's data.
9. When the same tests were done with the division between high and low shares of government based on the average value of GY for 1960-70, the results were similar but the negative coefficient of DGY^2 in regression 3 achieved significance at only the 10 percent level.
10. The income level dividing high and low income countries was just under $900 in constant 1975 dollars.
11. Two other studies which divided their samples on the basis of level of development found that for the low income countries the impact of the share of government expenditures on output growth was either positive and insignificant [Landau, 1983] or less negative than for higher income countries [Grier and Tullock, 1989]. These studies differ from the present one in that they do not employ first differences and they neither hypothesize nor search for a threshold level of development beyond which the government share variable changes sign.
12. The differences between the coefficients of $DGY1$, $DGY2$, and $DGY3$ in regression 8 are significant at at least the 2 percent level. Alternatively, if the constant term or the coefficient of DIY is allowed to vary in this formulation across the four basic groups, the differences in their size are never significant at the 5 percent level.

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