JOURNAL OF ECONOMIC DEVELOPMENT
Volume 18, Number 1, June 1993

The Differential Effects on Economic Growth of Government Expenditures on Education, Welfare, and Defense*

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This paper investigates the differential impact of the various types of the government expenditures on economic growth. Evidence from 58 countries suggests that (1) the growth rate of educational expenditures has a significant positive impact on economic growth; (2) the growth rate of welfare expenditures has an insignificant negative impact on economic growth; and (3) the growth rate of defense expenditures has a positive impact on economic growth that is insignificant for all 58 countries but significant for a subset of 47 countries for which data is available for a longer time period.

I. Introduction

The impact of government size on economic growth is still, despite extensive debate, an unsettled issue. According to Ram (1986), government provides public goods and services which enhance the productivity of private sector inputs, harmonizes conflicts between private and social interests, and prevents exploitation by foreigners. Therefore, government expenditures are critical in the process of economic development, and increased government expenditure is necessary for output growth. On the other hand, supply siders argue that government regulations impose costs

* Research for this paper has been supported by a Summer Research Fellowship from the University of Nebraska at Omaha University Committee on Research.

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growth rate of per capita GDP using cross-section data from both developed and developing countries for the period of 1975-1985. We use Summers and Heston's (1988) international comparable data for 121 market economies on real GDP, investment, and government expenditures, and data on each component's share of total government expenditures published by the International Monetary Fund to determine expenditures on each component of government expenditure. Our main contribution is to establish, using an estimating equation derived from an aggregate production function, that growth of education expenditures has a significant positive impact on the growth rate of per capita real GDP, that growth of welfare expenditures has an insignificant negative impact on the growth rate, and that the impact of defense expenditures on the growth rate is less clear.

Our analysis differs from Landau's (1986) in the following ways: we conduct a cross-section analysis, while Landau preformed a pooled cross-section time series analysis. Our estimating equation is derived from an aggregate production function. Our measure of government expenditure, the compound annual growth rate of government expenditure over the period of study, differs from Landau's measure, the lagged three-year average ratio of government expenditure to GDP. Our data is for a different set of countries and for a different time period. Our choice of countries and time period was dictated by the availability of IMF data on government expenditure shares.

The next section describes our theoretical framework. Section 3 describes our data set. Section 4 presents and discusses our empirical results. Section 5 concludes the paper.

II. The Anlaytical Framework

The theoretical framework is based on a constant returns to scale aggregate production technology that incorporates government expenditures as well as the labor force and the capital stock.[1] The aggregate production function can be written as:

$$(1) \qquad Y = F(L, K, G_e, G_d, G_w),$$

where Y is real aggregate output, L is the labor force, K is the total capital

[1] Ashauer's (1989) study is based on a similar aggregate production function with labor, capital, and total government expenditures as the arguments.

estimating equation which includes the share of GDP spent on various government activities and Kormendi and Meguire's (1985) specification which includes the growth rate of the share of GDP spent by government. Ram has argued that specifications such as ours which include the growth rate of government expenditures are preferred on both theoretical and empirical grounds to those which include the share of government expenditures.

It is difficult to sign the coefficients of government expenditures. The sign of b_2 (the coefficient for the growth rate of educational expenditures) should be positive, as educational expenditures contribute to the formation of human capital which should have a positive effect on the rate of economic growth. The sign of b_3 (the coefficient for the growth rate of defense expenditures) is a matter of dispute. It has been argued that defense expenditures increase the productivity of private capital and labor, and thus increase the rate of economic growth by increasing national security, by increasing the level of research and development and by introducing new technologies. Others have argued that defense expenditures reduce the rate of economic growth by increasing political tensions and thus reducing national security and by diverting scarce investment and technical talents from the civilian economy. However, Gold (1990) has argued that defense spending is not an important explanation of the performance of the U.S. economy. Thus, empirical evidence is required to determine the impact of defense expenditures on economic growth. The sign of b_4 (the coefficient for the growth rate of welfare expenditures) is also theoretically indeterminate. Lack of food may limit workers in low income developing countries to a few hours of hard work per day, according to Schultz (1961). In these countries an increase in the growth rate of welfare expenditures that benefits the poor may increase both the quality of labor and the quantity of labor. In the developed nations, given their higher absolute living standards and large welfare expenditures, an increase in the growth rate of welfare expenditures may cause a decrease in both the quality of labor and the quantity of labor. Also, inefficiencies resulting from the additional taxes required to finance these expenditures can decrease output growth.

The sign of b_1 (the marginal product of capital) should be positive. The sign of b_5 (the negative sum of the capital elastiticy of output and the government expenditure elasticities of output) will be negative unless the sum of the government expenditure elasticities of output, $b_2 + b_3 + b_4$, which can be positive or negative, is negative and larger in absolute value than the capital elasticity of output, $f_1 K/Y$, which should be positive.

Table 1

ESTIMATED COEFFICIENTS FOR EQUATION (5)

	1	2	3	4
Variable (Coefficient)	**N = 47**	**N = 58**	**N = 47**	**N = 58**
Constant	−0.012	0.011	−0.854	0.008
	(−0.093)	(1.04)	(−0.4)	(0.65)
Capital, I/Y	0.22	0.112	0.216	0.128
(b_1)	(3.60)	(2.06)	(3.43)	(2.08)
Education exp., $\dot{G}_e$	0.20	0.169	0.18	0.157
(b_2)	(2.71)	(2.49)	(2.11)	(2.07)
Defense exp., $\dot{G}_d$	0.138	0.021	0.14	0.022
(b_3)	(2.76)	(0.49)	(2.81)	(0.52)
Welfare exp., $\dot{G}_w$	−0.089	−0.002	−0.096	0.009
(b_4)	(−1.76)	(−0.05)	(−1.73)	(0.18)
Population, $\dot{L}$	−0.672	−1.04	−0.51	−1.065
(b_5)	(−2.33)	(−4.56)	(−1.46)	(−4.12)
Africa			−0.007	0.005
(b_6)			(0.79)	(0.57)
Latin America			−.005	−.001
(b_7)			(−0.63)	(−0.095)
Adjusted r^2	0.48	0.41	0.55	0.51

t values are in parentheses.

for 58 countries for the period 1976-1985 or 1975-1984. Each observation in the cross-section consists of a country's average value for each variable for the relevant time period. We also estimated equation (5) for the 63 countries for which complete data is available for at least eight consecutive years and for each subset with the members of OPEC, identified in the Appensix, excluded. These results, which are available from the authors, do not differ significantly from the results reported in Table 1.

The equation's explanatory power as measured by the adjusted r squres is high for cross-section data. The signs and significance of the coefficients are consistent with our hypotheses. The estimated coefficient for investment's share of real GDP, b_1, and for the growth rate of educational expenditures, b_2, are both positive and significant for both subsets. The

Table 2

SUMMARY STATISTICS

Variable (Notation)	Data Subset All Countries N = 47	N = 58
Growth rate of per capita GDP ($\dot{y}$)	0.0186	0.0142
	(0.024)	(0.0261)
Population growth rate ($\dot{L}$)	0.0154	0.0179
	(0.0114)	(0.0137)
Investment share of GDP (I/Y)	0.161	0.1539
	(0.0502)	(0.0537)
Growth rate of defense exp. y ($\dot{G}_d$)	0.0323	00378
	(0.0619)	(0.075)
Growth rate of welfare exp. ($\dot{G}_w$)	0.0323	0.0357
	(0.0771)	(0.0728)
Growth rate of educational exp. ($\dot{G}_e$)	0.0207	0.0211
	(0.0452)	(0.0567)
Growth rate of total gov. exp. ($\dot{G}$)	0.0361	0.0382
	(0.0259)	(0.0292)

Standard deviations are in parentheses.

penditures published by the IMF and Summers and Heston's (1988) international comparable data on real GDP, investment, and government expenditures we determined that expenditures on defense, welfare, and education have different impacts on economic growth. The growth rate of education expenditures has a positive and significant impact on economic growth in all cases. The growth rate of welfare expenditures has a negative impact on economic growth in all but one case, but this impact is insignificant in all cases. The growth rate of defense expenditures has a positive impact on economic growth that is significant for one subset of countries but is insignificant for the other subset.

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