THE SCOPE OF GOVERNMENT AND THE WEALTH OF NATIONS

James Gwartney, Randall Holcombe, and Robert Lawson

Pushed along by the failures of socialism, the idea that a market economy provides the foundation for prosperity has gained widespread acceptance in recent years. Many countries have moved toward an environment more consistent with economic freedom and the smooth operation of a market economy. Trade barriers have been reduced, monetary systems have become more stable, marginal tax rates have been lowered, and various price controls—including exchange and interest rate controls—have been liberalized or eliminated.[1] Yet in one critical dimension—the size of government—most nations have moved in the other direction. Over the past several decades, government expenditures as a share of GDP have been rising, resulting in more resource allocation through government.

Table 1 illustrates the growth of government in countries that are members of the Organization for Economic Cooperation and Development (OECD). Data for the 1960–96 period are shown for all 23 nations that have been members throughout the period. Measured as a share of GDP, total government expenditures have grown substantially in every one of the OECD countries. In 1960 government

---

Cato Journal, Vol. 18, No. 2 (Fall 1998).

James Gwartney is Professor of Economics and Policy Sciences at Florida State University. Randall Holcombe is DeVoe Moore Professor of Economics at Florida State University and Chairman of the Research Advisory Council of the James Madison Institute for Public Policy Studies. Robert Lawson is Assistant Professor of Economics at Capital University in Ohio and Director of Fiscal Policy Studies for the Buckeye Institute for Public Policy Solutions. This paper draws on the authors' Joint Economic Committee study, *The Size and Functions of Government and Economic Growth* (1998).

[1]For a discussion of the multifaceted nature of economic freedom and evidence that there have been significant recent moves toward economic liberalism in several areas, see Gwartney, Lawson, and Block (1996). Economic theory indicates that such liberalization will promote economic growth (see Barro 1996; Kreuger 1993, 1997; Gwartney and Lawson 1997; Scully 1988; and Torstensson 1994).

TABLE 1

THE SIZE OF GOVERNMENT IN OECD COUNTRIES, 1960–96

Total Government Outlays as a Percentage of GDP

Country	1960	1970	1980	1990	1996	Increase 1960–96
Australia	21.2	25.5	34.0	37.7	37.5	16.3
Austria	35.7	39.2	48.9	49.3	52.7	17.0
Belgium	34.5	36.5	50.7	54.6	54.5	20.0
Canada	28.6	35.7	40.5	47.8	46.4	17.8
Denmark	24.8	40.2	56.2	58.6	60.8	36.0
Finland	26.6	31.3	36.6	46.8	59.4	32.8
France	34.6	38.9	46.1	49.9	54.7	20.1
Germany	32.4	38.6	48.3	45.7	56.0	23.6
Greece	17.4	22.4	30.5	49.6	49.4	32.0
Iceland	28.2	29.6	32.2	39.9	37.3	9.1
Ireland	28.0	39.6	50.8	40.9	37.7	9.7
Italy	30.1	34.2	41.9	53.8	52.7	22.6
Japan	17.5	19.3	32.6	31.9	36.9	19.4
Luxembourg	30.5	33.1	54.8	45.5	49.3	18.8
Netherlands	33.7	46.0	57.5	57.5	58.1	24.4
New Zealand	27.7	34.4	47.0	50.0	42.3	14.6
Norway	29.9	41.0	48.3	51.3	46.4	16.5
Portugal	17.0	21.6	25.9	41.9	46.0	29.0
Spain	13.7	22.2	32.9	43.0	45.4	31.7
Sweden	31.0	43.7	61.6	60.8	66.1	35.1
Switzerland[a]	17.2	21.3	29.3	30.9	36.9	19.7
United Kingdom	32.2	39.2	44.9	42.3	43.7	11.5
United States	28.4	32.5	33.7	34.8	34.6	6.2
Average	27.0	33.3	42.8	46.3	48.0	21.0

[a]The data for Switzerland are for current government expenditures only.

SOURCES: *OCED Economic Outlook* (December 1997); OECD *Historical Statistics* (various issues); *IMF Government Finance Statistics Yearbook, 1994* (for 1990 Luxembourg data); *New Zealand Official Yearbook* (various issues); and *Economic Report of the President (February 1997).*

expenditures in this group averaged 27 percent of GDP. By 1996 they had grown to 48 percent of GDP. This is a staggering increase, especially when one considers the conservative nature of the measure employed. If government expenditures had been measured in constant purchasing power units, or on a per capita basis, the increases in the size of government would have been much greater.

This increase in government expenditures reflects a substantial broadening in the scope of government beyond its traditional functions. Economic theory provides some basis for belief that certain government activities—for example, the protection of property rights, the provision of a legal structure for settling disputes, and the allocation of funds for investment in infrastructure and human capital—may enhance economic growth. However, as we will show, the growth of government in recent decades has not been in those core areas. On the contrary, government has expanded into activities the legitimacy of which is highly questionable. As this has happened, economic growth has slowed. The evidence examined below illustrates that there is a persistent robust *negative* relationship between the level (and the expansion) of government expenditures and the growth of GDP.[2] Our findings indicate that a 10 percent increase in government expenditures as a share of GDP results in approximately a 1 percentage point reduction in GDP growth.

Expenditures on the Core Functions of Government

Economic theory indicates that various functions of government—we will refer to them as core functions—can improve economic efficiency and thereby enhance economic growth. What are these core functions? While there is some room for debate concerning the precise activities that comprise the core functions, two general categories emerge: (1) activities that protect persons and their property from plunder, and (2) provision of a limited set of goods that for various reasons markets may find it difficult to provide.[3]

Long ago, Thomas Hobbes (1651) described life without government as ''nasty, brutish, and short'' and argued that the law and order provided by government was a necessary component of civilized life.[4]

[2]The impact of government spending on economic growth has been addressed by Barro (1989), Barth and Bradley (1987), Grier and Tullock (1987), Grossman (1988), Kormendi and Meguire (1985), Landau (1983, 1986), Peden (1991), Peden and Bradley (1989), and Scully (1992, 1994).

[3]Buchanan (1975: 95) refers to these two functions as the protective state and the productive state. In his discussion of the proper role of government, Adam Smith ([1776] 1937: 653–81) listed three factors: (1) ''protecting the society from the violence and invasion of other independent societies,'' (2) ''protecting, as far as possible, every member of the society from the injustice or oppression of every other member,'' and (3) ''erecting and maintaining those public institutions and public works, which, though they be in the highest degree advantageous to a great society, are however of such a nature that the profit could never repay the expense to any individual or small group of individuals.'' This list is also reflective of our core functions of government.

[4]Not everyone would agree with Hobbes, of course. Rothbard (1973) provides an interesting argument that the private sector could more effectively undertake all of the functions normally done by government.

Viewed from another angle, economic theory indicates that secure property rights, enforcement of contracts, and the operation of a court system to resolve disputes provide the foundation for the smooth operation of a market economy.[5] These activities reflect the protective functions of government. A stable monetary regime can also facilitate the operation of markets and business planning across time periods. In addition, government provision of some public goods, such as roads and national defense to protect the citizenry from intrusions by foreigners, may also promote economic growth. While governments may have a comparative advantage in the provision of this legal and physical infrastructure, it should be noted that market supply of those services is not uncommon. As Bruce Benson (1990) has shown, private sector actions often create legal structures and provide for their enforcement. Private police and security guards outnumber public police in the contemporary United States, and many people choose private arbitration for dispute resolution despite the availability of public courts. The private sector also successfully produces physical infrastructure and one might question, in the post-cold war era, the magnitude of military expenditures to defend a nation's borders.

Despite these reservations, we will assume all of these activities are core functions of government. We also include education, even though it does not exhibit the characteristics of a public good and the private sector has shown itself quite capable of providing high-quality education. Table 2 presents data for total government spending on all of these activities at all levels of government—federal, state, and local—in the United States for various years since 1960. Protection of persons and property—including expenditures on police, courts, and the operations of a penal system—consumed only 1.5 percent of GDP in 1992, up from 0.64 percent in 1960. Expenditures on national security (including international affairs) summed to 5 percent of GDP in 1992, down substantially from 9.3 percent in 1960. Government expenditures on education totalled 5.67 percent of GDP in 1992. Government expenditures on physical infrastructure (highway, sewage, sanitation, and the environment) and the operational costs of the Federal Reserve System are also included. Even with this generous concept of core functions, total government spending on these items summed to less than 15 percent of GDP in 1992. They were only

[5]See Knack and Keefer (1995) and Keefer and Knack (1997) for evidence that a legal system that protects property rights, enforces contracts, and relies on rule-of-law principles for the settlement of disputes among parties enhances economic growth. Also see Bauer (1972) and North (1990) for a comprehensive analysis of how the development of property rights and legal institutions has influenced economic performance.

TABLE 2

U.S. FEDERAL, STATE, AND LOCAL GOVERNMENT EXPENDITURES FOR SELECT BUDGET CATEGORIES AS A PERCENTAGE OF GDP, 1960–92

Budget Categories	1960	1970	1980	1990	1992
Protection of Persons and Property					
Police Protection	0.39	0.49	0.54[b]	0.55	0.66
Corrections	0.14	0.16	0.24[b]	0.43	0.50
Judicial	0.11	0.11	0.13[b]	0.16	—
Other Criminal Justice System Activities	na[a]	0.06	0.11[b]	0.14	0.34[c]
Subtotal	0.64	0.82	1.02[b]	1.28	1.50
National Security					
National Defense	8.72	7.75	4.81	5.21	4.78
International Affairs	0.58	0.34	0.46	0.24	0.26
Subtotal	9.30	8.09	5.27	5.45	5.04
Education					
Elementary and Secondary Education	2.88	3.62	3.34	3.52	3.67
Higher Education	0.61	1.06	1.22	1.28	1.35
Other Education	0.20	0.70	0.61	0.52	0.65
Subtotal	3.69	5.38	5.17	5.32	5.67
Highways	1.82	1.61	1.21	1.08	1.08
Sewage, Sanitation, and Environmental Protection	0.53	0.60	0.97	0.80	0.85
Federal Reserve System: Expenses	—	0.03	0.03	0.02	0.02
TOTAL	15.98	16.53	13.67	13.95	14.16

[a]Legal representation and other related activities were not counted toward criminal justice system expenditures prior to 1969.
[b]These percentages were calculated from 1979 expenditures and GDP because detailed data were not collected in 1980.
[c]Judicial, legal, and other activities were combined into a single category in the 1992 data.
SOURCES: Bureau of the Census, *Statistical Abstract of the United States* (various issues); *Board of Governors of Federal Reserve System: 1996 Annual Report*; and *Economic Report of the President* (February 1997).

slightly higher in 1960 and 1970. As Table 1 shows, total government expenditures in the United States are currently about 35 percent of GDP, suggesting that they are more than twice as high as would be necessary to provide for the core functions of government.

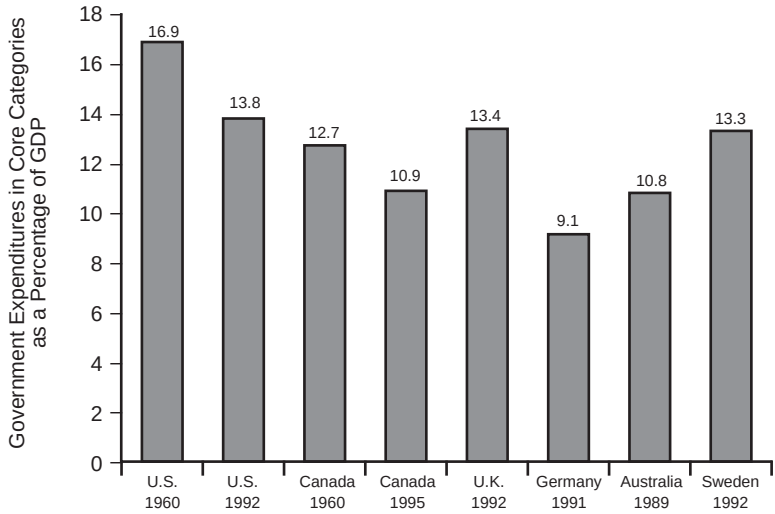
Figure 1 provides data from other developed economies for various years and tells a similar story. The categories are slightly different, due to data availability, but the message is the same: The core functions of government can be financed with spending of less than 15 percent of GDP. Even countries like Sweden, with very large public sectors, do not spend more than 15 percent of GDP in these core areas.

Expansion of Government beyond the Core Functions

While economic theory suggests that government expenditures on core functions may enhance growth, it also indicates that expansion of government much beyond those core activities will exert a negative impact on the economy. There are several reasons why this is true. First, the higher taxes and/or additional borrowing required to finance government expenditures impose an excess burden on the economy. As government expands and taxes increase, the economic loss emanat-

FIGURE 1

CORE GOVERNMENT EXPENDITURES AS A SHARE OF GDP



NOTES: The core categories are: (1) public order and safety, (2) national defense, (3) education, and (4) transportation and communication. Many would also include expenditures on the operation of a central banking system, sanitation, and environmental protection. Since these figures were not available for all countries, we did not include them here. In the United States and Canada, government expenditures in these two additional areas were approximately 1 percent of GDP. Government expenditures in core categories have been between 9 percent and 14 percent of GDP in major OECD countries in recent years.

ing from the excess burden of taxation increases more than proportionally.[6] Even if the productivity of government expenditures did not decline, the increasing costs of higher taxes (and additional borrowing) would eventually overwhelm the benefits of additional government spending.

Second, as government grows, its productivity will decline. Government expenditures that protect individuals and their property and provide for the smooth operation of a market economy may yield a high rate of return. As government expands into areas such as the provision of infrastructure and education, the returns may still be attractive. However, as government continues to grow relative to the market sector, diminishing returns will set in. Eventually, as more and more expenditures are channeled into activities for which government is ill suited, negative returns will set in and economic growth will be retarded.[7]

Third, the political process inhibits the entrepreneurship that drives economic growth. To a large degree, growth is a discovery process. As entrepreneurs discover new and improved technologies, better methods of production, and opportunities that were previously overlooked, they are able to combine resources into goods and services that are more highly valued (Kirzner 1973, 1997; Schumpeter 1912; and Holcombe 1998). This is the central element of wealth creation and growth. While markets encourage alertness and impose swift and sure punishment on those who make bad decisions, adjustment to change is much slower in the public sector. By way of comparison with markets, the required time for weeding out errors (for example, bad investments) and adjustments to changing circumstances, new information, and improved technologies is more lengthy for governments. Thus, expansion of government relative to the market sector slows this important source of economic growth.

Fourth, as government grows, it invariably becomes more heavily involved in the redistribution of income and regulatory activism. In turn, these activities will encourage individuals to seek personal income via government favors rather than through production in exchange for income. As this happens, resources are shifted away from wealth-creating activities toward the pursuit of wealth transfers. This shift

[6]Browning (1987) was one of the first to document the magnitude of the marginal excess burden accompanying the tax levels currently imposed in the United States. His estimates indicate that the deadweight loss of an additional dollar of tax revenue is between 30 cents and 50 cents. See also Crook (1997: S18).

[7]Holcombe (1995) suggests that many activities normally considered appropriate for government would be better performed by the market.

will retard economic growth and lead to income levels well below the economy's potential.[8]

A fundamental model of economic growth developed by Robert Solow (1956) suggests that while some economies may be wealthier than others, in the long run they should all grow at the same rate. More recent work has suggested that not only do economies actually have substantially different growth rates over lengthy time periods (Quah 1996, Gwartney and Lawson 1997), there are also good theoretical reasons for believing that countries can maintain the different rates (Lucas 1988, Romer 1990). This issue is important because if long-run growth rates across countries are all the same (or approximately the same), the long-term consequences of economic policies that impede growth are less severe. This study will examine the issue empirically by looking at how the size of government has affected economic growth.

Size of Government and Growth: OECD Countries

Our analysis indicates that even though government expenditures on core functions will initially promote growth, there is good reason to believe that additional spending beyond the core areas will impede efficiency and retard economic growth.[9] We now turn to an empirical investigation of this issue.

Compared to most other countries around the world, the institutional arrangements and income levels of the 23 long-term OECD members are relatively similar. Politically, all are currently stable democracies. Their legal structures reflect a commitment to the rule of law. Monetary arrangements have been stable enough to avoid hyperinflation during the post-World War II era. In the area of international trade, OECD members have been at the forefront of those promoting more liberal trade policies within the framework of GATT and the World Trade Organization. Yet, despite their similarities in many areas, the size of government as a share of the economy has varied substantially among OECD countries (and across time periods). This section examines the effect of different levels of government expenditures on the economic growth in these countries.

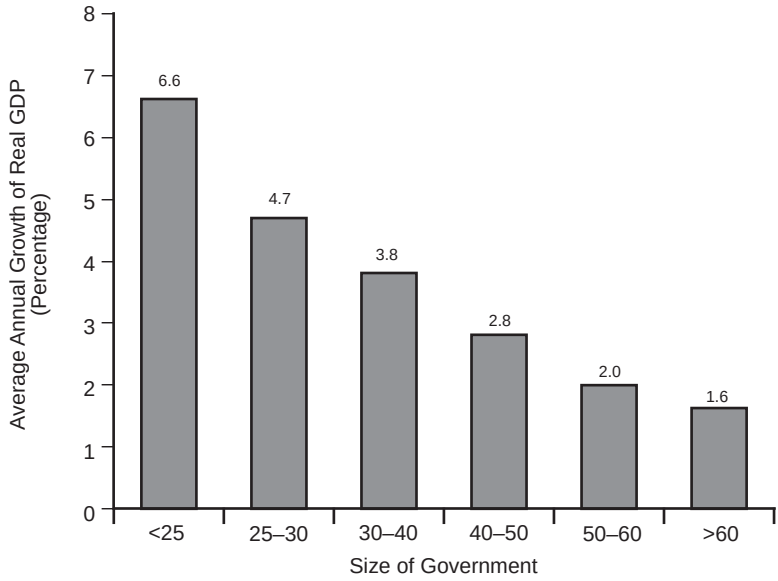
[8]Economists use the term "rent seeking" to describe the actions of individuals and groups that pursue personal income via income transfers and other government favors (rather than through production in exchange for income). See Tullock (1967) and Kreuger (1974) for additional details and analysis of the harmful side effects of rent seeking.

[9]See Barro (1990) for the development of a formal model with the characteristics we have outlined here.

Figure 2 presents a bar graph showing the relationship between the size of government and the average year-to-year growth rate of real GDP. An observation consists of the size of government for a country and its GDP growth rate during that year. Therefore, the total number of observations is 851, reflecting the 37 years of the time period (1960–96) and the 23 countries included in the analysis. In total, there were 81 cases during the 1960–96 period where a nation had government expenditures of less than 25 percent of GDP.[10]

FIGURE 2

SIZE OF GOVERNMENT AND THE ANNUAL GROWTH OF REAL GDP FOR OECD COUNTRIES, 1960–96



(Total Government Spending as a Percentage of GDP)

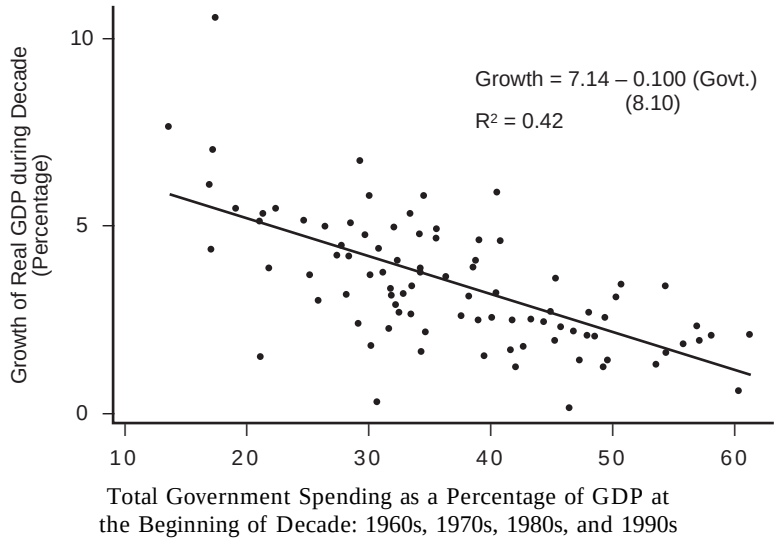
[10]Throughout this paper, total government expenditures as a share of GDP are used to measure the size of government. Total government expenditures include spending on government consumption, transfers and subsidies, net interest on outstanding debt, and capital goods. Previous cross-country studies have generally used government consumption (or central government expenditures) as a share of GDP to measure the size of government. While those figures are easier to obtain and available for more countries, they are often highly misleading. The government consumption figures substantially understate the size of government for countries with either (a) large transfer and subsidy sectors or (b) a high level of government investment. Similarly, the central government figures will understate the size of government for countries (for example, United States and Switzerland) where substantial expenditures are undertaken at lower levels of government. Thus, the total government expenditure figure is both a more accurate and more comprehensive indicator of government size.

Countries in that category averaged a GDP growth rate of 6.6 percent. As the size of government increased, the average growth rate persistently fell. When the size of government exceeded 60 percent of GDP, the average growth of real GDP was an anemic 1.6 percent. The data clearly illustrate an inverse relationship between the year-to-year growth of real GDP and the size of government in OECD countries during the 1960–96 period.

Figure 3 examines the relationship between the size of government and economic growth over a more lengthy time period. The size of government at the beginning of a decade is measured on the x-axis, while growth of real GDP during the decade is recorded on the y-axis. The figure contains four dots for each of the 23 OECD members—one for each of the four decades—for a total of 92 dots. As the plot illustrates, there is a clearly observable negative relationship between the size of government and long-term growth of real GDP. The line drawn through the plotted points is the least-squares regression line showing the relationship that best fits the data. The slope of the line indicates that a 10 percentage point increase in government

FIGURE 3

HIGHER GOVERNMENT SPENDING REDUCES ECONOMIC GROWTH AMONG OECD COUNTRIES



NOTE: These data indicate that a 10 percentage point increase in government expenditures as a share of GDP reduces the annual rate of growth by 1 percentage point.

expenditures as a share of GDP leads to approximately a 1 percentage point reduction in economic growth. The R-squared of .42 indicates that government spending alone explains about 42 percent of the differences in economic growth among OECD nations during the sample period.

Looking at the regression line in Figure 3, government expenditures of 20 percent of GDP are associated with a decade-long average annual growth rate of approximately 5 percent, while government expenditures of about 45 percent are associated with only half as much economic growth. Among these countries, a 25 percent increase in the size of government as a share of GDP retarded the annual rate of economic growth by approximately 2.5 percent. This evidence indicates that big government imposes a heavy penalty in the form of a lower rate of economic growth.[11]

Several other things are worth noting about Figure 3. First, although in theory government expenditures could be too low if they were insufficient to finance the core activities of government, there is no evidence in Figure 3 that any government actually spent so little that the performance of the economy was harmed. There are six observations for nations with government expenditures as a percentage of GDP well below 20 percent. Of these six observations, five lie above the "best fit" line, and the remaining point is only slightly below. The empirical evidence indicates that all of these countries had government expenditures that exceeded the amount necessary to maximize economic growth.

The OECD countries represented in Figure 3 are developed economies with relatively high per capita incomes. With the possible exception of Japan, none are "growth miracles"—less developed economies that might have high rates of growth because their current level of income is relatively low. Japan did register very high growth rates for several decades. But even here there is a revealing story. At the beginning of the 1960s, the total expenditures of the Japanese government were only 17.5 percent of GDP and they averaged only 22.0 percent of GDP during the decade. With that environment, the Japanese economy registered an average annual growth rate of 10.6 percent

[11]Increases in government expenditures, even expenditures on government consumption, do not necessarily mean a proportional increase in the "volume" of goods supplied by the government. Government subsidies may simply increase the prices of privately supplied goods, without exerting much impact on the quantity produced. When goods are supplied by government enterprises, greater expenditures may merely reflect inefficiency and higher cost. Interestingly, this latter factor actually enlarges GDP. To the extent these factors are important, the real GDP figures overestimate the growth rates of countries with substantial increases in the size of government.

in the 1960s. During the 1960s, the Japanese economy fit the small government, high growth mold. Over the next three decades, the Japanese government grew steadily; by 1996, government spending had soared to 36.9 percent of GDP. At the same time, Japan's growth rate moved in the opposite direction, falling to 5.4 percent in the 1970s, 4.8 percent in the 1980s, and sagging to 2.2 percent in the 1990s. The growth of government in Japan has brought with it a slowdown in the rate of economic growth.

Additional insights on the relationship between the size of government and economic growth can be gleaned from comparisons between OECD members with large increases in government expenditures and those with small increases. The size of government as a share of GDP rose in all OECD countries between 1960 and 1996. However, there was substantial variation. The top part of Table 3 shows data for those countries with the smallest increases in size of government as a share of GDP, while the bottom portion of the table presents the figures for those with the largest increases. The bottom row of Table 3 indicates the average for all 23 OECD members.

In five OECD countries (United States, Iceland, United Kingdom, Ireland, and New Zealand), government's share of GDP increased by less than 15 percentage points. As a share of GDP, the average size of government for this group rose from 28.9 percent in 1960 to 39.1 in 1996, an increase of 10.2 percentage points. In contrast, government expenditures increased by more than 25 percent of GDP in six OECD countries (Spain, Portugal, Greece, Finland, Sweden, and Denmark). The size of government in those six countries averaged 54.5 percent of GDP in 1996, a dramatic increase from the 21.8 percent figure for 1960.

The right side of Table 3 shows the annual growth rates of real GDP at the beginning (1960–65) and ending (1990–96) of the period for both the countries with "slow" and "rapid" expansion in the size of government. Both groups experienced increases in the size of government and reductions in economic growth. However, the growth rate reductions were substantially greater for the countries with the largest expansion in the size of government. The reduction in the average growth rate of real GDP was 5.2 percentage points for the rapid expansion in government group compared to an average decline of 1.6 percentage points for those with the least increase in the size of government. The reduction in the growth rate of every nation in the "big growth of government" group exceeded the OECD average (bottom line of table). In contrast, each country in the top group—those with the least expansion in government—registered a below average reduction in growth. Moreover, every nation in the bottom

TABLE 3

THE GROWTH RATE OF REAL GDP IN THE 1990S COMPARED TO 1960–65, ACCORDING TO INCREASES IN THE SIZE OF GOVERNMENT BETWEEN 1960 AND 1996: OECD COUNTRIES

	Govt. Spending as a Percentage of GDP			Growth Rate of Real GDP		
	1960 (1)	1996 (2)	Change (3)	1960–65 (4)	1990–96 (5)	Change (6)
Countries with Smallest Increases in Size of Govt.						
United States	28.4	34.6	6.2	4.4	2.2	−2.2
Iceland	28.2	37.3	9.1	4.5	1.5	−3.0
Ireland	28.0	37.7	9.7	4.1	5.9	1.8
United Kingdom	32.2	43.7	11.5	3.5	1.2	−2.3
New Zealand	27.7	42.3	14.6	5.0	2.5	−2.5
Average	28.9	39.1	10.2	4.3	2.7	−1.6
Countries with Largest Increases in Size of Govt.						
Portugal	17.0	46.0	29.0	6.5	1.7	−4.8
Spain	13.7	45.4	31.7	8.5	1.8	−6.7
Greece	17.4	49.4	32.0	7.2	1.2	−6.0
Finland	26.6	59.4	32.8	5.6	0.0	−5.6
Sweden	31.0	66.1	35.1	4.9	0.6	−4.3
Denmark	24.8	60.8	36.0	5.9	2.0	−3.9
Average	21.8	54.5	32.7	6.4	1.2	−5.2
All OECD Countries						
Average	27.0	48.0	21.0	5.5	1.9	−3.6

SOURCES: Derived from *OECD Historical Statistics and OECD Economic Outlook.*

group had a larger reduction in growth than any of the nations in the top group.

It is interesting to note that in 1960 government expenditures as a share of GDP for every country in the top part of Table 3 exceeded the OECD average of 27 percent, and their average GDP growth rate of 4.3 percent was below the OECD average (5.5 percent). The situation was exactly the opposite for this same set of countries in the 1990s. By the 1990s, the ratio of government expenditures to GDP of the countries in the top group was below the OECD average, while their growth rates were above the average. Just the reverse happened to the nations in the bottom part of Table 3. In 1960 their government expenditures as a share of GDP were below the OECD average, while their growth rates exceeded the OECD average. By 1996 their expenditures had risen above the OECD average (except for Portugal and Spain, which were just slightly below it) and their growth rates had fallen below the average.

Because these figures are for the same countries (and country groupings with relatively similar political structures, incomes, and levels of development), the potential impact of differences in such things as culture, natural resources, and motivation of the people is minimized. It would have been difficult for a researcher seeking to isolate the impact of size of government on economic growth to have designed a more relevant experiment. This is what makes the pattern of the results presented in Table 3 so compelling. When the size of government was below the OECD average—the 1990s for the top group and 1960s for the bottom group—those nations enjoyed above average growth. In contrast, when the size of government exceeded the OECD average—the 1960s for the top group and 1990s for the bottom group—those nations suffered below average growth.

Using the entire sample of 23 OECD countries, the regression results of Table 4 add precision to these findings. As in Figure 3, there are four observations for each nation. The dependent variable in the first two regressions is the growth of real GDP in a nation during a decade, and the first independent variable is government expenditures as a share of GDP at the beginning of that decade. The second independent variable is the change in government expenditures as a share of GDP during the decade. The regression shows that there is a strong negative relationship between the share of GDP going to government and the growth rate of GDP during the subsequent decade, with a *t*-statistic of 8.14 (indicating significance at the 99 percent level of confidence). There is a weaker relationship, although still statistically significant at better than the 90 percent level, between the change in government expenditures and GDP growth.

TABLE 4

THE IMPACT OF GOVERNMENT EXPENDITURES ON INVESTMENT AND GROWTH IN OECD COUNTRIES, 1960–96

Independent Variable	Dependent Variable: Growth of Real GDP during the Decade (1)	(2)	Dependent Variable: Investment as a Share of GDP during the Decade (3)
Government Expenditures as a Share of GDP at Beginning of the Decade	−0.11*** (8.14)	−0.099*** (6.81)	−0.159*** (5.14)
Change in Government Expenditures during the Decade	−0.046* (1.70)	−0.055** (2.06)	—
Investment as a Percentage of GDP	—	0.087** (2.08)	—
Constant	7.724	5.365	28.4
Adjusted R^2	.43	.45	.22
Number of Observations	92	92	92

NOTE: *t*-ratios are in parentheses below estimated coefficients; * indicates coefficient is statistically significant at the 90 percent confidence level; ** indicates coefficient is statistically significant at the 95 percent confidence level; *** indicates coefficient is statistically significant at the 99 percent confidence level.

SOURCES: Derived from *OECD Historical Statistics and OECD Economic Outlook*.

The second regression adds total gross investment as a percentage of GDP as an independent variable. Investment would be expected to increase economic growth, and the positive sign on the investment coefficient shows that more investment is correlated with higher economic growth.[12] The coefficient of the investment variable is significant at better than the 95 percent level of confidence. Even after adjusting for cross-country differences in investment rates, both the level of government expenditures and the change in the size of government during the decade remain highly significant. This provides additional support for the hypothesis that a larger public sector reduces economic growth.

The 0.11 coefficient for government expenditures at the beginning of the period in equation 1 of Table 4 indicates that a one unit increase in the size of government as a share of GDP at the beginning of the period reduces the growth rate during the decade by 0.11 percentage points. At the same time, an increase in government expenditures during the decade reduces growth by an additional 0.046 percentage points. Even when investment is included as an independent variable in the model (equation 2), growth is reduced by approximately one-tenth of a percentage point when the size of government is one unit greater at the beginning of the period (and by approximately five hundredths of a percent for each percentage point expansion in the size of government during the decade). This indicates that if government expenditures were 10 percentage points higher (for example, 35 percent rather than 25 percent) as a share of GDP at the beginning of the period, the long-term growth rate of real GDP would be a full percentage point lower.[13] Correspondingly, a 10 percentage point increase in the size of government during the decade would reduce growth by five-tenths of a percentage point.

Higher government expenditures can crowd out investment, and the third regression in Table 4 indicates that this has been true for

[12]We also analyzed models that included both investment in human capital (changes in the mean years of schooling of persons 25 years and older during a decade) and variability in the rate of inflation for OECD countries. Neither of the variables was significant. In the case of the human capital variable, we suspect this reflects that years of schooling are an imperfect measure—they do not reflect differences in quality of schooling and other factors that might influence learning. For OECD countries, differences in the variability of inflation were relatively small during the time period under consideration. This may account for the insignificance of this variable.

[13]When maintained over a lengthy time period, relatively small differences in growth rates can exert a dramatic impact on income levels. For example, if the growth rate of the U.S. economy had been 1 percent lower during the 1870–1990 period, today the per capita income level of the United States would be approximately the same as that of Mexico (see Barro and Sala-i-Martin 1995).

the OECD countries in this sample. In this equation, investment as a share of GDP is the dependent variable, while size of government is the independent variable. There is a strong negative correlation between the two. The 0.159 coefficient for the size of government variable indicates that a 10 percentage point increase in the government expenditures as a share of GDP reduces an economy's investment rate by approximately 1.6 percentage points. The *t*-statistic (5.14) is significant at more than the 99 percent level, illustrating that the estimated negative impact of the government expenditures on investment is highly reliable.

Evidence From a Broader Set of Countries

This section examines another data set of 60 countries, including both less-developed and high-income industrial economies. Because these nations are more diverse than OECD members, adjustment for differences in political economy characteristics is important. Data limitations restrict this analysis to the 1980–95 period. Table 5 summarizes the statistical results from four different regression models. All countries for which the required data could be obtained are included in the analysis. The average annual growth rate of real GDP during the 1980–95 period is the dependent variable. The various independent variables included in the alternative models are indicated down the left side of the table.

The first four independent variables are measures of government expenditures and their changes. In addition to these size-of-government variables, alternative models also consider the impact of (a) security of property rights, (b) variability in the rate of inflation, (c) schooling (investment in human capital), and (d) investment in physical capital. These control variables are included in order to help us better isolate the independent effects of the size of government.

The data on security of property rights come from the *International Country Risk Guide*, a private rating service that has tracked the political, financial, and economic risks accompanying business and investment activities in various countries since 1982. While these ratings cover several areas, three of them pertain specifically to the security of property rights and presence of rule of law. These three factors are risk of expropriation, risk of contract violation, and presence of rule of law. We placed the ratings on a scale of 1 to 10; a higher rating is indicative of more secure property rights and stronger support for rule of law principles.[14] Because the data series begins in 1982,

[14]The country ratings for risk of expropriation and risk of contract violation were on a scale of 1 to 10, while that for rule of law was on a scale of 1 to 6. After the rule of law variable was converted to a scale of 1 to 10, the three components were averaged to derive the property rights rating.

TABLE 5

IMPACT OF THE SIZE OF GOVERNMENT ON ECONOMIC GROWTH IN DEVELOPED AND LESS-DEVELOPED COUNTRIES, 1980–95

	Dependent Variable: Annual Rate of Real GDP Growth			
Independent Variables	(1)	(2)	(3)	(4)
Government Expenditures as a % of GDP, 1980	−0.62*** (2.86)	−0.49** (2.36)	−0.42* (1.73)	−0.40* (1.69)
Change in Govt. Expenditures as a % of GDP, 1980–85	−1.15** (2.60)	−1.17** (2.81)	−1.01** (2.30)	−1.09** (2.58)
Change in Govt. Expenditures as a % of GDP, 1985–90	−1.15** (2.50)	−0.97** (2.29)	−0.83* (1.72)	−0.81* (1.76)
Change in Govt. Expenditures as a % of GDP, 1990–95	−0.68 (1.30)	−0.6 (1.22)	−0.31 (0.55)	−0.40 (0.74)
Property Rights (Initial Rating)	1.37*** (6.50)	1.30*** (6.53)	1.13*** (4.48)	1.17*** (4.85)
Change in Property Rights, 1982–95	1.46*** (5.50)	1.36*** (5.38)	1.25*** (4.30)	1.25*** (4.50)
Std. Dev. of Inflation Rate	−0.82* (1.78)	−0.57 (1.29)	−0.68 (1.49)	−0.52 (1.17)

Change in Years of Schooling (Age 25 and older) between 1980 and 1995	—	0.61** (2.80)	—	0.55** (2.38)
Investment as a % of GDP	—	—	0.085* (1.67)	0.048 (0.92)
Constant	−8.27	−8.72	−8.81	−8.98
Adjusted R2	.48	.54	.49	.54
Number of Observations	60	60	60	60

NOTE: *t*-ratios are in parentheses below estimated coefficients; * indicates coefficient is statistically significant at the 90 percent confidence level; ** indicates coefficient is statistically significant at the 95 percent confidence level; *** indicates coefficient is statistically significant at the 99 percent confidence level.

the initial rating is for 1982 rather than 1980. Components for both the property rights rating in 1982 and the change in the rating during the 1982–95 period are incorporated into the analysis.

High and variable rates of inflation may also retard economic growth. Nations with high levels of inflation tend to have high variability in their inflation rates, but there is a slightly stronger statistical relationship between the variability of the inflation rate (as measured by its standard deviation) and GDP growth than is true for the level of inflation. Thus, the standard deviation of the inflation rate was used to measure the impact of inflation on economic growth.[15] Both human and physical capital can also be expected to enhance economic growth. Mean years of schooling for persons age 25 and over is used as a measure of improvements in the level of human capital.[16] The physical investment component is the average investment rate as a share of GDP during the 1980–95 period.

In addition to the size of government variables, equation 1 of Table 5 includes the initial property rights rating in 1982, the change in the rating between 1982 and 1995, and the standard deviation of the inflation rate in the model. Both property rights variables are highly significant and the inflation variable is also significant at the 90 percent level. With regard to the size of government variables, the coefficients for the level of government expenditures as a share of GDP, and the changes between 1980 and 1985 and between 1985 and 1990 were all negative and highly significant. The adjusted R^2 of .48 in equation 1 indicates that the variables incorporated into this model explain 48 percent of the variation in growth rates among this diverse set of countries.

The coefficient for the level of government expenditures indicates that a 10 percentage point increase in size of government at the beginning of the period was associated with approximately a six-tenths of a percentage point reduction in growth during the entire 15-year period. The coefficients for the change in size of government variables between 1980 and 1985 and between 1985 and 1990 indicate that a 10 percentage point increase during each of these periods reduced the growth of real GDP by 1.15 percentage points during the 1980–95 period. While the change in size of government between 1990 and 1995 is negative, it is insignificant. The larger coefficients (and greater significance) of the variables reflecting the changes in the size of

[15]Robert Lucas, Thomas Sargent, Robert Barro and others have highlighted the adverse side effects of variability of the rate of inflation. For a theoretical analysis of this subject and related issues, see Miller (1994).

[16]The years of schooling data are from Barro and Lee (1993).

government for the earlier five-year periods compared to the five years of the 1990s make sense. After all, the expansion in government between 1980 and 1985 (and 1985 and 1990) will influence growth for a decade or more of the 1980–95 period, whereas the government growth of the 1990s will exert an impact over only a short portion of the 1980–95 period.

Equation 2 adds the schooling variable to the model. The changes in the years of schooling between 1980 and 1995 exert the expected positive impact, and the variable is significant at the 95 percent level of confidence. With the exception of the inflation variable, all of the other variables remain significant. Equation 3 deletes the schooling variable from the model and inserts the investment rate. The investment variable has the expected sign and it is significant at the 90 percent level of confidence. The size and significance of the other variables is very similar to that of equation 2.

Finally, equation 4 incorporates both the schooling and investment variables into the model along with the property rights, inflation, and size of government measures. In this more comprehensive model, both the initial level of government expenditures and the change during both of the five-year periods of the 1980s continue to be significant at the 90 percent level or more. The property rights and schooling variables are also highly significant. While the inflation and investment variables have the expected signs, they are no longer significant. The R^2 for equation 4 indicates that the variables of this model explain 54 percent of the variation in the ratings among this diverse set of countries.

The results in Table 5 illustrate that there is a strong positive correlation between the security of property rights and economic growth.[17] This relationship highlights the importance of a legal structure that protects property rights, helps with the enforcement of contracts, and provides a fair mechanism—rule of law—for the settlement of disputes between parties. Table 5 also indicates that improvements in human capital are an important source of growth. Increases in educational attainment consistently lead to increases in the growth rate of GDP. While the statistical links between growth and the price level stability and investment variables were weaker, their significance may well have been reduced because of their correlation with other variables in the model.

The primary reason for including the ''control variables'' in Table 5 was to see whether size of government exerted a strong independent

[17]See Knack and Keefer (1995) and Keefer and Knack (1997) for additional evidence on this point.

impact on the growth of real GDP. The results indicate that it does. Even after accounting for differences across countries in protection of property rights, inflation, education, and investment, the level of government expenditures at the beginning of the period and the growth of those expenditures during the first decade of the 15-year period exerted statistically significant effects on the growth of GDP during the 1980–95 period. As in the case of the OECD nations, the magnitude of these coefficients indicates that the negative impact of size of government on growth is sizeable.

Evidence From OECD Nations with Shrinking Government

Despite the pervasive growth of government, there have been a few instances where nations have substantially reduced their government expenditures. Table 6 isolates the only three instances of a substantial decline in government expenditures as a share of the economy among OECD countries during the 1960–96 period. Ireland saw government expenditures as a share of GDP grow from 28 percent in 1960 to 52.3 percent in 1986. This situation was reversed during the 1987–96 period when government expenditures as a share of GDP declined from the 52.3 percent level of 1986 to 37.7 percent in 1996, a reduction of 14.6 percentage points. From 1960 to 1977, when government expenditures increased from 28 percent to 43.7 percent, Ireland's real GDP growth rate was 4.3 percent. It declined to 3.4 percent during the 1977–86 period, as the government further expanded to 52.3 percent of GDP. During the recent decade of shrinking government, the annual growth rate in Ireland's real GDP rose to 5.4 percent. As government expenditures shrank in Ireland, Ireland's economic growth increased.[18]

The experience of New Zealand is also revealing. Between 1974 and 1992, New Zealand's government expenditures as a share of GDP rose from 34.1 percent to 48.4 percent. Its average growth rate during this period was 1.2 percent. Recently New Zealand began moving in the opposite direction. The percentage of GDP devoted to government expenditures was reduced from 48.4 percent in 1992 to 42.3 percent in 1996, a reduction of 6.1 percentage points. Compared to the earlier period, New Zealand's real GDP growth has increased by more than 2 percentage points to 3.9 percent.

[18]Interestingly, Ireland is the only OECD country with a higher growth rate of real GDP during the 1990s than during the 1960s.

TABLE 6

COMPARING PERIODS OF EXPANSION IN THE SIZE OF GOVERNMENT WITH PERIODS OF SHRINKAGE: IRELAND, NEW ZEALAND, AND THE UNITED KINGDOM

Country and Time Period	Government Outlays as a Percentage of GDP			Growth Rate of Real GDP during Period
	Beginning of Period	End of Period	Change	
Ireland				
Periods of Expanding Government				
1960–77	28.0	43.7	15.7	4.3
1977–86	43.7	52.3	8.6	3.4
Period of Shrinking Government				
1987–96	52.3	37.7	−14.6	5.4
New Zealand				
Period of Expanding Government				
1974–92	34.1	48.4	14.3	1.2
Period of Shrinking Government				
1993–96	48.4	42.3	−6.1	3.9
United Kingdom				
Period of Expanding Government				
1960–82	32.2	47.2	15.0	2.2
Period of Shrinking Government				
1983–89	47.2	40.7	−6.5	3.7

SOURCES: Derived from *OECD Economic Outlook* and *OECD Historical Statistics.*

The United Kingdom provides additional evidence. Government's share of GDP rose from 32.2 percent in 1960 to 47.2 percent in 1982. During that period, the UK's GDP growth rate was 2.2 percent and there was widespread reference to the "British disease." Between 1982 and 1989, government's share of GDP declined by 6.5 percentage points to 40.7 percent. Responding, the UK's rate of GDP growth increased from 2.2 percent to 3.7 percent. While shrinking government has been rare in the past few decades, evidence from places where government has shrunk is consistent with the hypothesis that larger government lowers economic growth. The evidence illustrates that economic growth can accelerate if the size of government is reduced.

Conclusion

The findings of this paper show a strong and persistent negative relationship between government expenditures and growth of GDP, both for the developed economies of the OECD and for a larger set of 60 nations around the world.[19] In the few isolated cases where nations reduced their government expenditures by an appreciable amount, this reduction in the size of government was correlated with an increase in the growth rate of real GDP. The United States has followed the world trend toward larger government expenditures. Government outlays in the United States have grown from 28.4 percent of GDP in 1960 to 34.6 percent in 1996, and the GDP growth rate has fallen from an average of 4.4 percent in the 1960s to an average of 1.9 percent during the 1990–96 period. All this evidence points in the same direction: Larger government means slower economic growth.

After several decades of declining growth rates, the conventional wisdom is that high-income developed economies can no longer achieve and sustain real growth rates of 3.5 percent and higher. For a while, the sluggish growth rates were blamed on rising energy prices. But real energy prices have been declining during the last 15 years, and there is no sign of a turnaround in growth. Some now argue that wealthy high-income nations are unable to grow rapidly because their citizens are unwilling to save very much. Still others argue that constraints imposed by technology, or the global movement of capital, or some other factor explains why today's growth rates are so much lower than a few decades ago.

[19]The sample of countries did not include any of the components of the former Soviet Union, China, or former communist nations from Eastern Europe, which keeps the collapse of communism from affecting the empirical results.

The evidence presented in this paper provides an alternative explanation: Increases in the size of government have slowed economic growth. More rapid growth is possible, but the higher potential growth can only be achieved if we are willing to reduce the relative size of government. The regression results presented above suggest that a decrease of 10 percent in government expenditures as a share of GDP will produce an increase in the GDP growth rate of about 1 percent. Within the context of the U.S. economy, if government spending as a share of GDP had remained at the 28.4 percent level of 1960, these estimates indicate that real GDP in 1996 would have been 20 percent greater.[20] The 1996 real GDP would have been $9.16 trillion rather than $7.64 trillion, which would have increased per capita income by $5,860.[21] For the average household of four, family income would have been $23,440 *higher* if the size of government had remained at the level of the 1960.[22] Big government extracts a heavy toll.

What level of government expenditures would maximize economic growth? The data analyzed here can only present an upper bound, because there is no evidence that any country in the data sets examined in this paper had a level of government expenditures insufficient to maximize growth. Some nations had government expenditures between 15 and 20 percent of GDP, and as Figure 3 indicates, those countries had higher rates of growth than nations with government expenditures in the range of 20 to 25 percent of GDP. There is no evidence that any of the nations examined here had governments so small that they inhibited growth.

These findings are highly consistent with the level of government spending on core functions—those activities that economic theory indicates are most likely to promote efficiency and enhance growth. These functions were defined generously and expenditures tabulated

[20]On average, government expenditures were 5 percent more than the 28.4 percent figure of 1960. This would reduce the GDP growth rate by half a percent a year, which compounded over the 36 year time period is 20 percent.

[21]It is even more striking to consider what would have happened if *non*-defense government expenditures had remained at their 1960 level as a share of GDP, while defense expenditures followed the downward path that actually occurred. In this case, the size of government would have fallen to 25.4 percent of GDP by the end of the 1960s, and it would have been just slightly lower throughout the rest of the period. If this had occurred, our estimates indicate that real GDP in 1996 would have been $10.6 trillion, more than 40 percent greater than the actual figure.

[22]Ironically, because government spending would have been a smaller share of a larger economy, the 1996 real value of government expenditures would have been almost unchanged. Spending 28.4 percent of $9.16 trillion would produce total government spending of $2.60 trillion, compared with actual government spending of $2.70 trillion in 1996.

in a manner likely to err on the high side.[23] Even with this generous conceptualization of core functions, current government expenditures in the United States and other industrial nations indicate that these functions can be provided with less 15 percent of GDP.

There is no evidence that governments spending between 15 percent and 20 percent are too small to maximize economic growth. On the other hand, it is clear that the core functions of government can be provided with less than 15 percent of GDP. Taken together, these two findings indicate that the growth-maximizing level of government expenditures is no more than 15 percent of GDP.[24] The evidence clearly shows that when the scope of government expands beyond this level, there is a negative impact on the wealth of nations.

References

Barro, R.J. (1989) "Economic Growth in a Cross Section of Countries." NBER Working Paper No. 3120. Cambridge, Mass.: National Bureau of Economic Research.

Barro, R.J. (1990) "Government Spending in a Simple Model of Endogenous Growth." *Journal of Political Economy* 98: S103–S125.

Barro, R.J. (1996) "Democracy and Growth." *Journal of Economic Growth* 1: 1–27.

Barro, R.J., and Lee, J. (1993) "International Comparisons of Educational Attainment." *Journal of Monetary Economics* 32: 363–94.

Barro, R.J., and Sala-i-Martin, X. (1995) *Economic Growth*. New York: McGraw-Hill.

Barth, J.R., and Bradley, M.D. (1987) "The Impact of Government Spending on Economic Activity." Manuscript. George Washington University.

Bauer, P.T. (1972) *Dissent on Development: Studies and Debates in Development Economics*. Cambridge, Mass.: Harvard University Press.

Benson, B.L. (1990) *The Enterprise of Law*. San Francisco: Pacific Research Institute.

Browning, E.K. (1987) "The Marginal Welfare Cost of Taxation." *American Economic Review* 77: 11–23.

[23]For example, all public education expenditures were included, even though experience has shown that the private sector is at least as adept at providing education as the public sector. All national defense spending and expenditures on highways and infrastructure were included as well.

[24]This figure is somewhat smaller than the estimates derived by other researchers, using different methodologies (and data sets). Peden (1991) estimates that for the United States the "maximum productivity growth occurs when government expenditures represent about 20 percent of GDP." Scully (1994) estimates that the growth-maximizing size of government (combined federal, state, and local) is "between 21.5 percent and 22.9 percent of gross national product (GNP)." However, these estimates have one thing in common with ours: they also indicate that government expenditures in the United States and other industrial countries are substantially greater than the growth-maximizing level.

Buchanan, J.M. (1975) *The Limits of Liberty: Between Anarchy and Leviathan*. Chicago: University of Chicago Press.
Crook, C. (1997) "The Hidden Cost of Taxes." *The Economist*, 20 September: S18.
Grier, K.B., and Tullock, G. (1987) "An Empirical Analysis of Cross-National Economic Growth, 1950–1980." Manuscript. California Institute of Technology.
Grossman, P.J. (1988) "Government and Economic Growth: A Non-Linear Relationship." *Public Choice* 56: 193–200.
Gwartney, J.D., and Lawson, R.A. (1997) *Economic Freedom of the World: 1997 Report*. Vancouver, B.C., Canada: Fraser Institute.
Gwartney, J.D.; Lawson, R.A.; and Block, W. (1996) *Economic Freedom of the World: 1975–1995*. Vancouver, B.C., Canada: Fraser Institute.
Gwartney, J.D., Lawson, R.A. and Holcombe R.G. (1998) *The Size and Functions of Government and Economic Growth*. Washington, D.C.: Joint Economic Committee of the U.S. Congress.
Hobbes, T. ([1651] 1950) *Leviathan*. New York: E.P. Dutton.
Holcombe, R.G. (1995) *Public Policy and the Quality of Life*. Westport, Conn.: Greenwood.
Holcombe, R.G. (1998) "Entrepreneurship and Economic Growth." *Quarterly Review of Austrian Economics* 1(Summer): 45–62.
Keefer, P., and Knack, S. (1997) "Why Don't Poor Countries Catch Up? A Cross-National Test of an Institutional Explanation." *Economic Inquiry* 35: 590–602.
Kirzner, I.M. (1973) *Competition and Entrepreneurship*. Chicago: University of Chicago Press.
Kirzner, I.M. (1997) "Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach." *Journal of Economic Literature* 35: 60–85.
Knack, S., and Keefer, P. (1995) "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures." *Economics and Politics* 7: 207–27.
Kormendi, R.C., and Meguire, P.G. (1985) "Macroeconomic Determinants of Growth: Cross-Country Evidence." *Journal of Monetary Economics* 16: 141–63.
Kreuger, A.O. (1974) "The Political Economy of the Rent-Seeking Society." *American Economic Review* 64: 291–303.
Kreuger, A.O. (1993) *Political Economy of Policy Reform in Developing Countries*. Cambridge, Mass.: MIT Press.
Kreuger, A.O. (1997) "Trade Policy and Economic Development: How We Learn." *American Economic Review* 87: 1–22.
Landau, D. (1983) "Government Expenditures and Economic Growth: A Cross-Country Study." *Southern Economic Journal* 49: 783–92.
Landau, D. (1986) "Government and Economic Growth in the Less Developed Countries: An Empirical Study for 1960–1980." *Economic Development and Cultural Change* 35: 35–75.
Lucas, R.E., Jr. (1988) "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22: 3–42.
Miller, P.J., ed. (1994) *The Rational Expectation Revolution: Readings From the Front Line*. Cambridge, Mass.: MIT Press.

North, D.C. (1990) *Institutions, Institutional Change, and Economic Performance*. Cambridge: Cambridge University Press.
Peden, E.A. (1991) "Productivity in the United States and Its Relationship to Government Activity: An Analysis of 57 Years, 1929–1986." *Public Choice* 69: 153–73.
Peden, E.A., and Bradley, M.D. (1989) "Government Size, Productivity, and Economic Growth: The Post-War Experience." *Public Choice* 61: 229–45.
Quah, D.T. (1996) "Convergence Empirics Across Economies with (Some) Capital Mobility." *Journal of Economic Growth* 1: 95–124.
Romer, P.M. (1990) "Endogenous Technological Change." *Journal of Political Economy* 98: S71–S102.
Rothbard, M.N. (1973) *For a New Liberty*. New York: Macmillan.
Schumpeter, J. ([1912] 1961) *The Theory of Economic Development*. Translated by R. Opie. Cambridge, Mass.: Harvard University Press.
Scully, G.W. (1988) "The Institutional Framework and Economic Development." *Journal of Political Economy* 96: 652–62.
Scully, G.W. (1992) *Constitutional Environments and Economic Growth*. Princeton, N.J.: Princeton University Press.
Scully, G.W. (1994) *What Is the Optimal Size of Government in the United States?* Dallas: National Center for Policy Analysis.
Smith, A. ([1776] 1937) *An Inquiry Into the Nature and Causes of the Wealth of Nations*. Modern Library ed. New York: Random House.
Solow, R.M. (1956) "A Contribution to the Theory of Economic Growth." *Quarterly Journal of Economics* 70: 65–94.
Torstensson, J. (1994) "Property Rights and Economic Growth: An Empirical Study." *Kyklos* 47: 231–47.
Tullock, G. (1967) "The Welfare Costs of Tariffs, Monopolies, and Theft." *Western Economic Journal* 5: 224–32.