What Is the Optimal Size of Government in the United States?

by

Gerald W. Scully

Executive Summary

American productivity has faltered since the 1950s. Productivity growth rates that were in the 3.0 to 3.5 percent range have fallen below 1 percent. As a result, many Americans have suffered a decline in their living standard. Considerable evidence points to the growth in the size of government since World War II and the accompanying increase in taxes as a cause.

Beyond some minimum level, government becomes a net drain on the private sector. When resources are allocated privately, the goal is the highest economic rate of return. When they are allocated by politicians or planners, the goal is the highest political return in the form of votes and campaign contributions.

What is this optimal level of government? A reliable econometric model developed for this study finds that:

- In order to maximize economic growth, the average rate for federal, state and local taxes combined should be between 21.5 percent and 22.9 percent of gross national product (GNP).

- Taxes as a share of GNP have not been in this range since 1949.

Real GNP increased at a compound growth rate of 3.5 percent per year from 1949 to 1989. If an average tax rate of 23 percent had been in effect throughout the 40-year period, the growth rate would have been 5.56 percent per year. As a result:

- Real GNP would have been $13.6 trillion by 1989.

- The average American family would have twice as much real income today as it actually has.

Would Americans have had to sacrifice important government programs in order to keep the overall tax rate down? Not at all. At the lower tax rate, higher growth would have produced more government revenue than the amount government actually collected at higher tax rates. Specifically:

- At a tax rate of 23 percent, government at all levels would have collected $11.6 trillion more in taxes.

- *This is enough money to have funded all actual spending programs enacted during that period with no public debt.*

Introduction[1]

Economist Adam Smith in the 18th century observed that tariff rates beyond a certain level became self-defeating because they reduced imports and hence tariff revenue. One reason was that high tariffs encouraged smuggling. Smith's interest in an inverse relationship between tax rates and government revenue reappeared in the 20th century among those who have been termed supply-side economists. Economist Arthur Laffer, who devised the Laffer Curve, popularized the idea that high tax rates give people incentives to not report, or to underreport, income or to change their behavior and simply earn less taxable income.

Laffer and his disciples noted that beyond a certain point government realizes less revenue when the tax rate rises. This new look at a 200-year-old finding was the basis of what has come to be known as the supply-side revolution, and it furnished the impetus for the Reagan administration's cuts in marginal tax rates. These cuts were responsible for a tremendous expansion of the economy during the 1980s.[2] Both tax compliance and tax revenue rose.[3] At lower tax rates, people are encouraged to realize more taxable income, base their investments on economic rather than tax considerations and spend less on wasteful tax avoidance.

But the thrust of supply-side economics was misfocused. Rather than determining what rates would maximize tax revenues to the government, conservative economists should have concerned themselves with what levels of taxation would maximize economic growth. Economists have done comparatively little work on this subject, and much of the research that has been done has concentrated on the various disincentives and distorting effects of taxation that cause efficiency losses.[4] However, determining the tax rates that lead to the greatest creation of private wealth is the key to solving some of the major economic problems of our time.

"Determining the tax level that leads to the greatest creation of private wealth is the key to solving our most important economic problem."

The Growth of the Tax Burden

A low tax rate was a major contributor to America's early economic growth.

- In the 18th century, federal, state and local taxes were less than 5 percent of gross national product, and 95 percent of federal revenue came from tariffs.

- In the 19th century, tax revenue as a share of GNP gradually rose, but it never exceeded 10 percent.

The personal income tax, introduced by the federal government in 1913, was the instrument that made possible the transformation of the United States from a low-tax to a high-tax economy, and two world wars supplied the impetus. Most state governments, and some city governments, have since

enacted their own income taxes — essentially piggybacking on the federal tax system.[5]

- With America's participation in World War I, total (federal, state and local) tax revenue exceeded 10 percent of GNP for the first time.

- The 20 percent barrier was broken with the onset of World War II.

- By 1969, at the beginning of the Nixon administration, tax revenue had climbed to more than 30 percent of GNP.

- Today, federal, state and local taxation is about 40 percent of GNP.[6]

Table I helps to explain the transformation in federal taxes. The table shows the minimum and maximum marginal income tax rates in selected years, the income in 1993 dollars necessary to trigger those tax rates, the number of returns filed and the number of tax returns as a percentage of the labor force, which is a crude measure of the size of the tax base.[7]

The Personal Income Tax: Early Stages. In 1913, the minimum marginal tax rate was 1 percent on income of $300,000 or more (measured in 1993 dollars). The top marginal tax rate was 7 percent on income above $7.5 million. Very few people had incomes that met the filing requirement. As a fraction of the labor force, far less than one-tenth of 1 percent had to file.[8] Is it any wonder that political opposition to the federal income tax was not widespread? The tax was imposed only on the very rich, and the rate they paid was modest.

"Initially, the income tax was imposed only on the very rich, and the rate they paid was modest."

Provoked by World War I, within four years marginal tax rates were increased, income subject to taxation was lowered and the tax base was expanded. In 1917, a tax of 2 percent was imposed on incomes above $23,000 and 67 percent on incomes above $23 million. About 8.5 percent of the labor force filed a tax return that year.

World War II: A Majority Become Income Tax Payers. Prior to World War II, a tax of 10 percent was imposed on incomes above $20,000 and a rate of 81 percent on incomes above $50 million in 1993 dollars. With the advent of war, the minimum marginal tax rate nearly doubled and the maximum marginal tax grew to 88 percent on incomes above $1.8 million. Presumably, patriotism overcame tax resistance. For the first time, employers were required to withhold income tax from wages. This increased compliance and 60.4 percent of the labor force filed returns. At this point, the majority of Americans were paying income taxes, leaving only the bottom third or so of the labor force free of taxation.

After the war, marginal tax rates fell, but so did the level of income subject to tax. By 1970, the minimum marginal tax rate was 14 percent on

TABLE I

The Growth of Federal Income Taxation

Year	Minimum Tax Rate	Income Subject to Minimum Tax Rate[1]	Maximum Tax Rate	Income Subject to Maximum Tax Rate[1] (millions)	Tax Returns (millions)	Returns/ Labor Force
1913	1%	$300,000	7%	$7.5	0.36	0.009%
1917	2	23,000	67	23.0	3.5	8.5
1921	4	32,800	73	8.2	6.7	15.7
1941	10	20,000	81	50.0	25.8	44.8
1942	19	18,000	88	1.8	36.5	60.4
1944	23	16,700	94	1.7	47.1	71.3
1954	20	11,000	91	1.1	56.7	84.7
1964	16	2,400	77	.9	65.4	86.2
1970	14	1,900	72	.4	74.3	86.5
1992	15	10,000	31	.75	113.7	89.6

[1] 1993 dollars.

incomes above $1,900 and the maximum rate was 72 percent on incomes above $380,000; and 86.5 percent of the labor force filed returns. Since 1970, a creeping incrementalism has widened the tax base somewhat. During the Reagan administration, the top marginal rate was reduced to 28 percent. As a result, people were encouraged to realize more taxable income, and the share of total income taxes paid by the wealthiest 1 percent of taxpayers rose from 18 percent to 27 percent.

"State and local governments also have become inventive in devising taxes."

State and Local Taxes. State and local governments also have become inventive in devising taxes. Where no state had a sales tax in the early 20th century, now very few states lack one. In some cases, their rates reach 8 percent of consumption expenditures. All but a few states have an income tax as well. In some cases, states take 10 percent or more of income. More than 30 states sanction gambling as a source of tax revenue.[9] Further, some cities have enacted their own sales and income taxes. And state and local governments also impose property taxes.

Some of the gains achieved during the Reagan years have been reversed by the Bush and Clinton administrations. Today, the top income tax rate is 39.6 percent and, when the phase-out of the standard deduction and the

personal exemption are figured in, the marginal tax rate on income reaches 43 percent for some taxpayers.

Why Taxes Matter

That American productivity has slid since the 1950s is a fact.[10] Annual productivity growth rates that were in the 3.0 to 3.5 percent range have fallen below 1 percent. As a result, many Americans have suffered a decline in their living standard.

Many excuses and rationalizations for the productivity slowdown have been offered, including inadequate physical and human capital formation, too much regulation (especially environmental regulation), low research and development expenditures and the energy crisis. There is considerable evidence, however, that the underlying cause is the growth in the size of government since World War II and the accompanying increase in taxes.[11]

How Taxes Affect Saving and Investment. In our tax code, interest on savings is taxed as ordinary income (rare among industrial nations). This lowers the return on saving and tends to reduce the amount saved. Until recently, we subsidized consumer credit by making it deductible. We heavily subsidize home ownership by making interest payments deductible. While perhaps laudable as social policy, this leads to more investment in housing and less in other productive activities than would be the case in the absence of the subsidy. On the investment side, if capital expenditures are financed with borrowed money, the interest is deductible. If they are financed with equity issues, they are not deductible. This leads to a distortion in debt-equity ratios for business. Also, tax depreciation schedules differ for different assets and often bear little relationship to economic depreciation. And since these schedules are not indexed for inflation, investment in long-lived assets is discouraged.[12]

How Taxes Affect Labor. Taxes drive a wedge between work and leisure. Moreover, we tax effort (income) progressively, so that the income from the last hour worked is taxed more heavily than the income from the first hour worked. The net effect is to discourage people from working. In addition, we have subsidized not working through antipoverty programs that have consumed $5 trillion (constant 1992 dollars) since the War on Poverty began during the Johnson administration.[13]

The Effects of Regulations.[14] Further distortions arise because different assets are subject to different regulations. A regulation is an implicit tax on an asset. For example, current regulations require gasoline stations to bury gasoline tanks in concrete bunkers and provide access to continuous inspection and monitoring. This adds about $250,000 to the cost of being in

the business, not a small sum for a marginal business.[15] Partly as a result of stiffer environmental regulation, we have half the gas stations we had a generation or so ago. In general, air and water quality standards have differing impacts on different industries. As a result, we get more output from less polluting industries and less output from more polluting ones.

The Costs versus the Benefits of Government Activities. Most people acknowledge that at least a minimum of government is necessary to the functioning of a free society and a growing economy. By providing a common defense against foreign enemies, a criminal justice system that promotes law and order and perhaps other "public goods"[16] as well, government expenditures contribute positively to private economic activity.

Beyond some level, however, government becomes a net drain on the private sector. Resources in a society may be allocated privately through the market system or politically through government. When resources are allocated privately, they tend to be allocated to the highest-valued use as entrepreneurs and capitalists seek the highest economic rate of return on their assets. When politicians (or central planners) allocate resources, they seek the highest political return (e.g., votes and campaign contributions).

Additionally, public choice literature shows that collective choice (through government) leads to the overproduction of public goods and the expansion of "rent-seeking" activities.[17] The government has a monopoly of legal coercion. It is the only entity that can use coercion to create a right that can be licensed or sold (e.g., a monopoly, tariff or subsidy). Those activities create permanent rents for special interests — a source of income that would be competed away in an unregulated market. Government-sanctioned exclusivity in a line of business can lead to a very high rate of return in that activity. For example, until recent years network-affiliated television stations in the 100 top markets had annual operating profits in excess of 35 percent.[18]

Thus, government expenditures and the taxes necessary to finance them provide both benefits and costs to the economy. National defense, a legal system, roads, airports and harbors are government-funded goods that are likely to make private economic activity more productive. Therefore, taxes collected to pay for these public expenditures are likely to increase the rate of economic growth over some range, as illustrated in Figure I. However, beyond some level, taxes are a drain on economic activity because the higher taxes lower the rate of economic growth.

"The optimal size of government is the size that maximizes economic growth."

This line of reasoning suggests that there is an optimal size of government. It further suggests that the optimal size is defined by the level of taxation that maximizes economic growth (or what is the same thing, private wealth creation).

Estimating the Tax Rate
That Maximizes Growth

The simple but reliable econometric model developed for this study was based on data from standard statistical sources. The parameters of the model [which is described in the Appendix] were estimated using established econometric techniques, and the equations of the model were then solved to calculate the growth-maximizing tax rate — the rate at which increased taxes and spending cease to increase economic growth and begin to decrease it. For the United States, the model was used to find that:

● The optimal (growth-maximizing) average rate for federal, state and local taxes combined is between 21.5 percent and 22.9 percent of GNP.

● Taxes as a share of GNP were at the optimal rate in 1949 and have not been there since.

FIGURE I

Economic Growth and Taxation

Economic Growth Rate

Maximum Growth Rate

0

Tax Rate That Maximizes Economic Growth
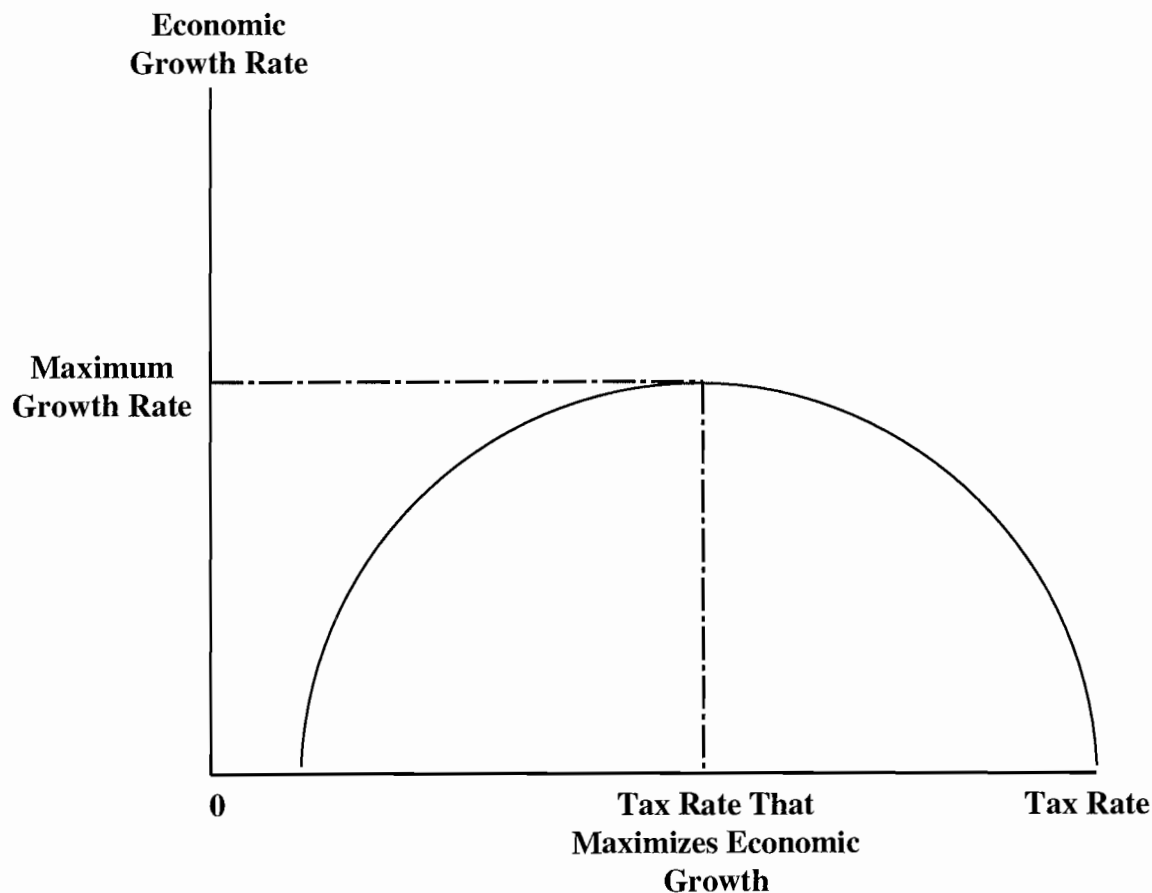
Tax Rate

The optimal tax rates derived from this model are consistent with previous studies that conclude that an optimal size of government is 19 percent of GNP and that government spending of 20 percent of GNP maximizes productivity.[19] All of these estimates imply that the economic growth rate and hence the level of GNP is far below what would have been achieved had the nation's total tax rate been kept at its 1949 level.

How Americans Could Have Been Twice as Wealthy

In 1929, federal, state and local taxes combined consumed a 10.9 percent share of GNP. In 1949, they were 21.7 percent of GNP — roughly the optimal tax rate calculated from the econometric model. By 1969, the tax share broke the 30 percent barrier and has been rising slowly since then. Real GNP was $1.563 trillion in 1949 (in 1993 dollars). By 1989, real GNP was near $6.2 trillion, reflecting a compound growth rate of 3.5 percent per year. The path of real GNP is shown in Figure II.

"If the optimal tax rate had been in effect since 1949, the average American family would have twice as much income as it has today."

Loss of Personal Income. As the model in the appendix shows, the optimal tax rate is at most 22.9 percent of GNP. At the 22.9 percent level, the corresponding real compound economic growth rate would have been 5.56 percent instead of the actual 3.5 percent.

- Had the optimal tax rate been in effect throughout the 40-year period, real GNP (1993 dollars) would have been $13.6 trillion rather than $6.2 trillion in 1989.

- As a result, the average American family would have twice as much real income as it has today.

Cumulative Loss of Income. From the time the tax rate exceeded the optimal point, more and more American resources have been devoted to less and less productive uses. The annual loss of income accumulates over time. Because taxes have been too high since 1949, the resulting lower economic growth and failure to maximize wealth have robbed the nation of almost *$95 trillion worth of output*. Specifically:

- The accumulated real GNP from 1949 to 1989 was $146.5 trillion.

- At the 1949 tax rate, however, accumulated real GNP from 1949-89 would have been $240.7 trillion — a difference of $94.2 trillion from the actual amount. [See Figure II.]

- On the average, this represents roughly $750,000 in lost income over the lifetime of every American family.

In general, the U.S. economy has sacrificed $2 worth of income for every $1 of tax paid beyond the level of optimal taxation. The implications of this finding are staggering.

Path of Real Gross National Product
(Trillions of 1993 dollars)

With Optimal Tax

Actual

$13.6

$6.2

$1.5

1949   1959   1969   1979   1989

Year
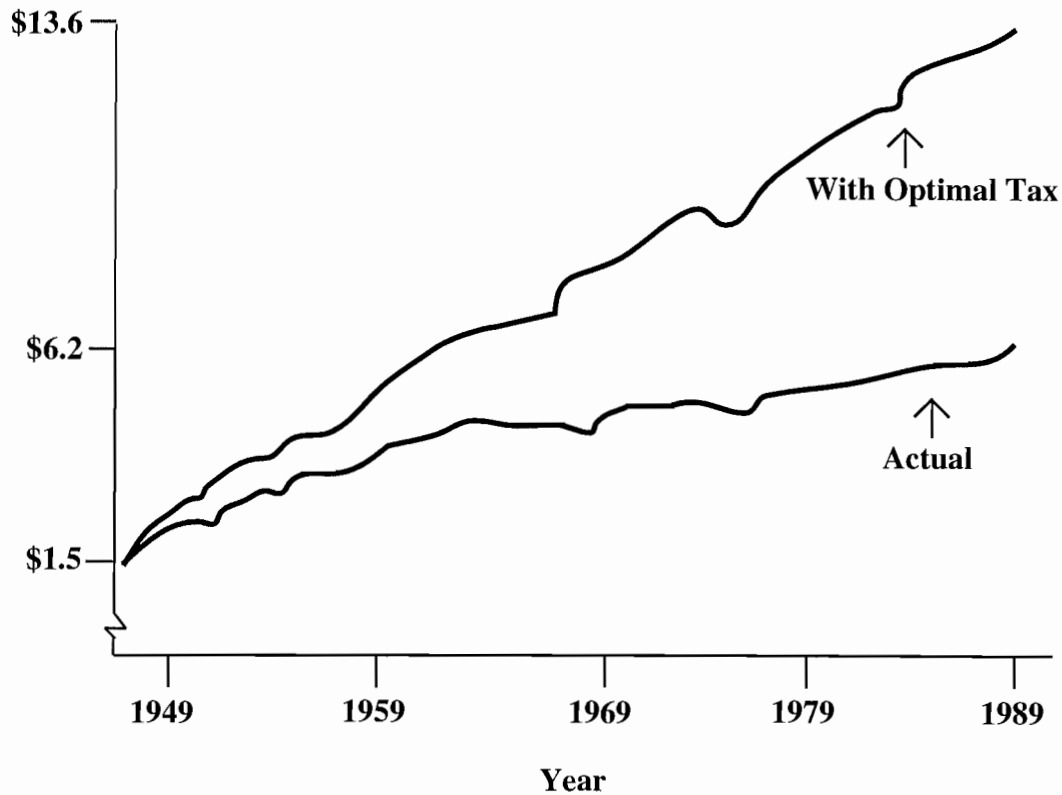
"The lost wealth is equal to $100,000 for every American household."

Loss of Personal Wealth. If received, most of the lost income would have been consumed. But a fraction would have been saved, adding to the average family's wealth over time. Because the wealth that would have been generated will never be seen, it is difficult to visualize what it would have meant. To put it into perspective, consider that:

- The total wealth of the nation, estimated at $12 trillion to $15 trillion, would be closer to $25 trillion today.

- This higher national wealth would mean that every American family would have $100,000 more personal wealth than it has today, on the average.

Government Tax Revenues Lost. Exceeding optimal size has been costly to government at all levels, too. Over the period from 1949 to 1989, federal, state and local governments collected a real total of $43.5 trillion in taxes. But if the total tax rate had been limited to 22.9 percent of GNP, government would have been collecting taxes on a far larger GNP, thanks to a higher growth rate. As a result, the combined governments would have collected a real total of $55.1 trillion. This implies that:

- Had the nation's total tax rate been limited to 22.9 percent of GNP, government would have collected $11.6 trillion more in taxes.

- This additional revenue would equal the total of all deficits in real terms since 1949.

- *Not only would government have had enough revenue to fund all spending programs enacted but had the total rate been held at the optimal level, we would have had no public debt.*

Why Have Voters Allowed Such Private Wealth Destruction?

One might ask why citizens have allowed this destruction of private wealth through excessive taxation and why politicians have given up $11.6 trillion in real taxes since 1949. There are several explanations.

First, and perhaps foremost, people generally are cognizant only of their actual earnings, not their potential earnings. They do not miss the lost 2.1 percent growth in real output because they never had it. Also, many are ignorant of the intimate link between taxation, incentives and economic efficiency. Moreover, because of the compulsory deduction of taxes from wages, many workers are unaware of their actual tax burden. Politicians have been ingenious in hiding taxes. Most people have no idea how much of their total income actually goes to taxes because the taxes are hidden or are a negligible portion of an individual transaction.

"Had the optimal tax rate been in effect, government could have funded all actual spending programs with no public debt."

Second, we do not have a very good theory of why government grows. As mentioned above, government has grown at times by distinct jumps (World War I and World War II each yielded a permanent 50 percent or so increase in the tax burden) and at times incrementally (e.g., the Roosevelt years, 1932-40, and during Johnson's Great Society of the 1960s). Patriotism silenced objection to higher tax rates and expansion of the tax base during the wars. The Great Depression conditioned people to the idea of a larger role for government. New and expanded government redistribution programs tend toward what might be called creeping incrementalism. For example, our food stamp program began in the early 1960s as a modest $175 million effort and now costs $28 billion. Another discrete jump in the size of government is on the horizon if it assimilates the $1 trillion health industry — an act equivalent to government absorption of the fifth largest economy in the world.

Third, politicians face a different set of priorities than do other citizens and often fail to appreciate how the world works. Since most politicians are lawyers, whose function is to redistribute income between the functional equivalent of plaintiffs and defendants, they often misunderstand how productive activities occur and how their decisions affect such activities. For example, for 200 years politicians have been told of the benefits of free trade,

yet with a couple of exceptions (e.g., Britain in the 19th century and the United States after World War II), protectionism has been preferred by politicians and generally favored by the public. For 200 years, politicians have been warned that excessive taxation promotes inefficiency and discourages compliance (from Adam Smith's observations about tariffs and smuggling to the supply-siders' observations about marginal tax rates). The deleterious effect of massive regulation on productivity is well known, yet the burden grows. Henry Manne, dean of the law school at George Mason University, has suggested that the amount of law, mainly statutes, is 100 to 1,000 times greater today than in 1933.[20]

Conclusion

Most Americans, scholars included, subscribe to the Anglo-American public finance tradition of thinking of government as benign. From this point of view, policy choices often seem irrational and enigmatic. Public choice theorists see the behavior of the politicians and the constituencies that elect them as rational, self-interested and self-serving, having more to do with reelection and rent-seeking than with economic efficiency. In this view, excessive taxation may arise simply because the tax rate consistent with political equilibrium among competing special interest groups exceeds the rate that maximizes economic growth.[21]

"Excessive taxation arises because of pressure from competing special interest groups."

NOTE: Nothing written here should be construed as necessarily reflecting the views of the National Center for Policy Analysis or as an attempt to aid or hinder the passage of any bill before Congress.

Appendix

This appendix describes the model and reports the econometric tests used to determine the optimal (growth-maximizing) tax rate. Let annual national output, Y, be related to the fraction of output that is government expenditure, G/Y, and the fraction that is retained by citizens after taxation, 1 - t, where t is the tax rate, in the following manner:

$$Y = a \, (G/Y)^b \, (1 - t)^c. \tag{1}$$

In logarithmic form, equation (1) is:

$$\ln Y = \ln a + b \, \ln(G/Y) + c \, \ln(1 - t). \tag{2}$$

It can be shown that the effect of an increase in government expenditure on output is positive, but at a diminishing rate. This relationship is established by differentiating (twice) the relationship between lnY and G in equation 2.

$$\partial \ln Y / \partial G = \{[\partial \ln Y / \partial \ln(G/Y)] \, [\partial \ln(G/Y)/\partial(G/Y)] \, [\partial(G/Y)/\partial G]\}$$

$$= b \, (Y/G) \, (1/Y)$$

$$= b \, G^{-1}, \text{ and}$$

$$\partial^2 \ln Y / \partial G^2 = -b \, G^{-2}.$$

Since, by definition, government expenditures equal government revenues $(G = tY)$, substitution into equation (2) yields:

$$\ln Y = \ln a + b \, \ln t + c \, \ln (1 - t). \tag{3}$$

It can be established also that the effect of an increase in the tax rate on output is negative at an increasing rate. This relationship is established by differentiating (twice) the relationship between lnY and t in equation 3.

$$\partial \ln Y / \partial t = \{[\partial \ln Y / \partial \ln(1 - t)] \, [\partial \ln(1 - t)/\partial(1 - t)] \, [\partial(1 - t)/\partial t]\}$$

$$= c \, (1 - t)^{-1} \, (-1)$$

$$= - c \, (1 - t)^{-1}, \text{ and}$$

$$\partial^2 \ln Y / \partial t^2 = - c \, (1 - t)^{-2}.$$

The growth-maximizing tax rate, t*, is obtained by differentiation of ln Y with respect to the tax rate, setting the result to zero, and solving for t*.[22] Solving for the growth-maximizing tax rate, yields:

$$t^* = b/(b + c).$$

The data utilized in empirically estimating the relationship between taxes and economic growth are from standard statistical sources: *The Historical Statistics of the United States* and *Statistical Abstract of the United States.* The variables are real gross national product and total federal, state and local taxes. The period over which estimation occurs is 1929-1989. [See Appendix Table.] Certain statistical tests on stationarity of the time series and autocorrelation were undertaken but are not reported here. See the article cited in Note 1 for the details.

All of the coefficients are of the right sign and are statistically significant above the 95 percent level (in equation (1), the coefficient of 1n(1 - t) is significant at the 94 percent level). Solving for the growth-maximizing tax rate, the result in equation (1) yields 21.5 percent = .64/(.64 + 2.34) and for equation (2) yields 22.9 percent.

APPENDIX TABLE

Estimates of Growth-Tax Relationship, 1929-1989

Variables/Statistics[1]	(1) ln RGNP[2]	(2) ln GROWTH[3]
Constant	-12.285	-10.367
	(1.95)	(2.65)
ln t_{-1}	0.641	0.586
	(2.53)	(2.84)
ln $(1 - t)_{-1}$	2.344	1.976
	(1.94)	(2.61)
WW2	0.075	0.070
	(2.39)	(2.47)
ln $RGNP_{-1}$	1.024	-
	(17.76)	
R^2 Adj.	.995	.434
DW	1.81	1.80

[1] Variables: $\ln t_{-1}$= logarithm of tax rate lagged one year; ln $(1-t)_{-1}$= logarithm of 1-tax rate lagged one year; WW2= dummy variable for World War II years (1941-1945); ln RGNP $_{-1}$= logarithm of real GNP lagged one year; R^2Adj.= coefficient of determination adjusted for degrees of freedom; DW= Durbin-Watson statistic.

[2] Logarithm of real GNP.

[3] Logarithm of rate of economic growth.

Footnotes

[1] This study is based on Gerald W. Scully, "The 'Growth Tax' in the United States," *Public Choice*, in press.

[2] The best analysis of the economic effects of supply-side policies is in Lawrence Lindsey, *The Growth Experiment: How the New Tax Policy Is Transforming the U.S. Economy* (New York: Basic Books, 1990). Lindsey began his research convinced that supply-side responses were negligible. After examining the evidence, he became one of the strongest proponents of supply-side policies. Lindsey concluded that, because of the dynamic economic response to the tax cuts, 70 percent of the potential direct revenue loss from the 1981 tax reductions was regained.

[3] By comparison, note that the average burden of taxation in Canada is about 25 percent higher. Smuggling and noncompliance are widespread. It is estimated that half of the Canadian budget deficit arises from noncompliance, including unreported barter agreements, ("I'll build your barn if you build mine") or unreported cash transactions. Heavy taxation of cigarettes (five times the U.S. level) and liquor encourages otherwise law-abiding citizens to cross the U.S. border or head for the Indian reservations. About a quarter of the tobacco and whiskey market is served by smugglers. *Wall Street Journal*, January 4, 1993, p. A8.

[4] See Richard A. Musgrave and Peggy B. Musgrave, *Public Finance in Theory and Practice* (New York: McGraw Hill, 1980), especially ch. 14, "Excess Burden and Efficiency," and ch. 31, "Fiscal Effects on Capacity Output," and references therein; and A. Sandmo, "Optimal Taxation — An Introduction to the Literature," *Journal of Public Economics,* July/August 1976.

[5] With few exceptions, state and local governments use the federal definition of income and rely on the federal government as protagonist in litigating whether particular income is taxable.

[6] Proposals to enact national health insurance, if passed, would push taxes as a percent of GNP above the 50 percent level.

[7] The trouble with this measure is that a joint return counts as a single filing whether or not the wife has income. If the wife works, she will be counted in the labor force but will be underrepresented in the tax base measure.

[8] In 1913, each tax filer was required to sign an oath attesting to the veracity of the return and all 360,000 returns were audited.

[9] When the Mafia ran the numbers rackets, its "juice" was 10 percent, but the states retain about 50 percent of the money garnered from Lotto!

[10] See E. A. Peden and M. D. Bradley, "Government Size, Productivity and Economic Growth: the Post-War Experience," *Public Choice,* Vol. 61, 1989, pp. 229-45.

[11] Economic sclerosis infects Europe as well, and now one hears of the end of the German miracle. While the size of government is larger in Europe, much of the difference is due to the European custom of providing national health care. If private spending on health care were added to government expenditures, the size of the U.S. government as a share of GDP would be comparable.

[12] See the discussion in Lindsey, *The Growth Experiment,* pp. 117-18.

[13] Peter J. Ferrara, ed., *Issues '94: The Candidate's Briefing Book* (Washington, DC: Heritage Foundation, 1994), p. 122.

[14] The cost of complying with federal regulation was estimated at $580 billion in 1993. See Thomas D. Hopkins, "The Cost of Federal Regulation," *Journal of Regulation and Social Costs*, Vol. 2, No. 1, March 1992.

[15] Author's conversation with gasoline station owners.

[16] Public goods have the characteristics of nonrivalry and nonexclusion in consumption. Thus, my viewing a monument does not reduce your view and, since I can't be stopped from looking at it, no price can be charged for the view. Very few goods have these characteristics: national defense, a system of weights and measures, the legal system, etc. Many goods have a publicness about them but are provided privately (e.g., a golf country club). Public goods should not be confused with goods and services provided at public expense (e.g., schooling, health care).

[17] Rent-seeking is the attempt to gain, through government action, more income than one could otherwise get for a good or service.

[18] Gerald W. Scully, *The Market Structure of Sports* (Chicago: University of Chicago Press, 1994).

[19] See P. J. Grossman, "The Optimal Size of Government," *Public Choice,* Vol. 56, 1987, pp. 193-200 and E. A. Peden, "Productivity in the United States and Its Relationship to Government Activity: An Analysis of 57 Years, 1929-1986," *Public Choice*, Vol. 69, 1991, pp. 153-73.

[20] Personal conversation with the author.

[21] A simple extension of the model [see the Appendix] shows that this is so. As noted in the Appendix, revenue to the state is $G = tY$. Converting to logs, substituting equation (3) for $\ln Y$, and differentiating $\ln G$ with respect to t yields

$$\partial \ln G/\partial t = b/t - c(1 - t) + 1/t = 0.$$

Solving for the revenue-maximizing tax rate, t^{**}, yields

$$t^{**} = 1 + b/(1 + b + c).$$

Clearly, $t^* < t^{**}$; i.e., the growth-maximizing tax rate is less than the revenue-maximizing tax rate.

[22] $\partial \ln Y/\partial t = [(\partial \ln Y/\partial \ln t) \, (\partial \ln t/\partial t)] +$

$\qquad [(\partial \ln t/\partial \ln(1 - t)) \, (\partial \ln(1 - t)/\partial(1 - t))$

$\qquad (\partial(1 - t)/\partial t)]$

$\quad = b/t - c/(1 - t) = 0.$

About the Author

Gerald W. Scully is a Senior Fellow of the National Center for Policy Analysis and a professor of economics in the School of Management at the University of Texas at Dallas. His articles have appeared in the *American Economic Review,* the *Journal of Political Economy,* the *Journal of Law and Economics, Public Choice* and other scholarly journals. Dr. Scully is also an expert on the economics of sports. His most recent book is *The Market Structure of Sports.*

About the NCPA

The National Center for Policy Analysis is a nonprofit, nonpartisan research institute, funded exclusively by private contributions. The NCPA originated the concept of the Medical IRA (which has bipartisan support in Congress) and merit pay for school districts (adopted in South Carolina and Texas). Many credit NCPA studies of the Medicare surtax as the main factor leading to the 1989 repeal of the Medicare Catastrophic Coverage Act.

NCPA forecasts show that repeal of the Social Security earnings test would cause no loss of federal revenue, that a capital gains tax cut would increase federal revenue and that the federal government gets virtually all the money back from the current child care tax credit. Its forecasts are an alternative to the forecasts of the Congressional Budget Office and the Joint Committee on Taxation and are frequently used by Republicans and Democrats in Congress. The NCPA also has produced a first-of-its-kind, pro-free enterprise health care task force report, written by 40 representatives of think tanks and research institutes, and a first-of-its-kind, pro-free enterprise environmental task force report, written by 76 representatives of think tanks and research institutes.

The NCPA is the source of numerous discoveries that have been reported in the national news. According to NCPA reports:

● Blacks and other minorities are severely disadvantaged under Social Security, Medicare and other age-based entitlement programs;

● Special taxes on the elderly have destroyed the value of tax-deferred savings (IRAs, employee pensions, etc.) for a large portion of young workers; and

● Man-made food additives, pesticides and airborne pollutants are much less of a health risk than carcinogens that exist naturally in our environment.

What Others Say About the NCPA

"...influencing the national debate with studies, reports and seminars."

— *TIME*

"...steadily thrusting such ideas as 'privatization' of social services into the intellectual marketplace."

— *CHRISTIAN SCIENCE MONITOR*

"Increasingly influential."

— *EVANS AND NOVAK*