

Optimal Taxation, Economic Growth and Income Inequality in the United States

Policy Report No. 316

by Gerald W. Scully

September 2008

Up to a point, government spending on public goods — such as national defense and protection of property — can raise the economic growth rate. However, as government spending rises, the tendency is to increase spending on nonproductive income transfers — such as subsidy and welfare programs. Research indicates that the high levels of taxation required to pay for such income transfers inhibit economic growth, whereas lower taxes can raise the rate of economic growth.

Executive Summary

However, nations with high rates of economic growth experience more income inequality among their citizens than would otherwise be the case. If there is a tax rate that maximizes the growth rate, and if there is a trade-off between income inequality and economic growth, there is also an income distribution that maximizes the growth rate.

This study uses an econometric model to analyze U.S. data on tax rates, gross domestic product (GDP) growth rates and income inequality from 1960 to 1990.

The results show that the growth-maximizing tax rate for the United States over the 1960–1990 period was an estimated 19.3 percent of GDP. During that time, however, federal, state and local governments consumed a much higher percentage of GDP, and the economy grew more slowly than it would have at the growth-maximizing level. For instance:

- At the mean tax rate of 30.7 percent, the growth rate predicted by the model was about equal to the observed mean GDP growth rate of 3.4 percent.
- At the optimal tax rate of 19.3 percent of GDP in the Scully model, the growth rate would have been 6.97 percent per year.

Using the optimal tax rate, one can determine the optimal level of income inequality that maximizes growth. A good measure of income inequality is the Gini coefficient, which is bound between 0 (a perfectly equal distribution of income) and 1 (a perfectly unequal distribution of income). The higher the value of the Gini coefficient, the more income inequality in a society. An analysis of the U.S. Gini coefficient for the years 1960 to 1990 revealed that:

- A 1 percentage-point change in the growth rate was associated with a 0.00075 point change (say, from 0.35 to 0.35075) in the Gini coefficient.
- The predicted Gini at a 3.4 percent growth rate is 0.354, which is very close to the actual mean Gini of 0.35 over the period.



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ISBN: 1-56808-192-8
www.ncpa.org/pub/st/st316/st316.pdf



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- Lowering the tax rate to 19.3 percent of GDP and multiplying the coefficient of growth on the Gini by 6.97 percent raises the Gini to 0.359, its growth-maximizing level.

Another way of looking at the Gini coefficient is to examine what a reduction in inequality costs. The results show that an improvement in the Gini of 0.001 costs 1.33 percent per year in per capita economic growth. Thus:

- Assuming a 3.4 percent annual growth rate, median household income (which was \$50,233 in 2007) would increase by nearly \$20,000 over 10 years.
- However, improving the Gini by 0.001 point per year would reduce the growth rate to 2.1 percent per year, and, as a result, median household income would increase by only \$11,422.

Some policy implications arise from this research and the research of others cited in this study. First, the size of the government is too large. Government expenditures have risen to levels that reduce the rate of economic progress. The evidence indicates that a fiscal size

(federal, state and local taxation) in the range of 15 percent to 20 percent of GDP is about the share that maximizes the growth rate. Beyond that share, further public expenditure, which will consist mainly of unproductive income transfers and subsidies, lowers the growth rate. At 30 percent or so of GDP, government outlays cut the economic growth rate by about half. With political pressure growing for such programs as a national health care system, one must keep in mind the effect that additional taxes, transfers and subsidies will have on economic growth and, thus, on the future economic prospects of those of whom such programs purport to help.

A second policy implication is that politicians need to be less concerned about income inequality and more concerned about the prospects for economic growth. Some factors, over which the government has little control, contribute to income inequality. Earnings differentials by educational and skill level, male-female wage differences and two-earner and single-mother households are the main sources of the rise in income inequality in recent decades. Government can do little to alter these structural trends.

About the Author

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Introduction

The three main fiscal functions of government are to provide public goods and services, to redistribute income and to stabilize the economy.¹ The use of government spending to stabilize the economy has largely been replaced by monetary policy.² Government remains heavily involved in the provision of public goods and in the redistribution of income.

A pure public good is a resource that people cannot be prevented from using and that cannot be exhausted by one person's use reducing another person's use. Examples include air, weather sirens, national defense and public roads. Conventional wisdom says that the market either fails to provide public goods or tends to underproduce them, and past debates have emphasized the necessity of taxation to provide these goods and services.

More recent research has emphasized the contribution of government expenditures to economic growth.³ Today, many economists recognize that certain types of government consumption and investment expenditure can raise the marginal productivity of the factors of production, thereby raising the economic growth rate.⁴

Economists also increasingly recognize that high levels of taxation inhibit economic growth and that lower taxes can raise the rate of economic growth. However, nations with high rates of economic growth pay for this progress with more income inequality among their citizens than would otherwise be the case.⁵ If there is a tax rate that maximizes the growth rate, and if there is a trade-off between income inequality and economic growth, there is also an income distribution that maximizes the growth rate.⁶

In this paper, the optimal (growth-maximizing) rate of taxation, the

trade-off between income inequality and economic growth and the degree of income inequality that maximizes growth are estimated for the United States over the period 1960–1990.

Whenever parameter estimates are to be obtained with the use of time series data, serious econometric issues arise. These issues center around the likely nonrandom nature of the distribution of the residuals obtained from time series estimation. A number of statistical tests and estimation procedures can be used to detect and correct these problems. All of these tests have been employed here, and estimation is by the appropriate econometric method.⁷

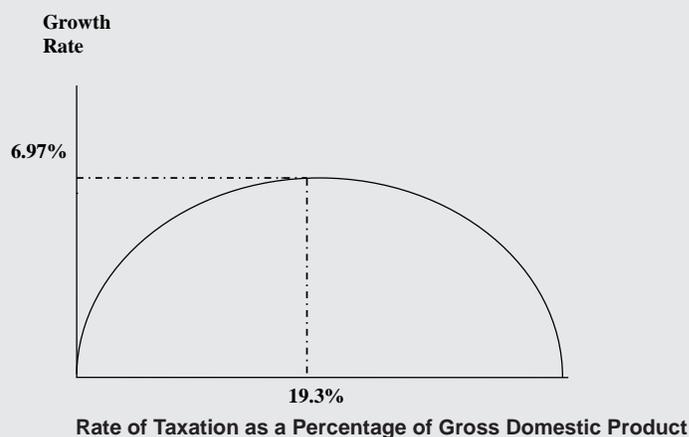
Optimal Taxation and Economic Growth

Since Nobel Laureate Paul Samuelson wrote about the government provision of public goods a half-century ago, some scholars have challenged the broadness of the role of government in the provision of public goods.⁸ Shortly after Samuelson's paper appeared, economist Charles Tiebout argued that people reveal their preferences for public goods, at least at the state and local level, by voting with their feet (moving from one locale to another). Because state and local governments offer a wide array of taxes and expenditures, individuals will locate in those areas that most match their preference for public goods.

Nobel Laureate James Buchanan argued that many goods that have a public aspect to them, such as golf courses, are privately provided and funded.⁹ That is, relatively few purely public goods exist. Rather, various goods are public only to a degree. Moreover, government need not be the only provider of public goods; Nobel Laureate Ronald Coase pointed out that the very public nature (nonexclusivity) of lighthouses did not prevent them from being built by private groups and from being paid for by voluntary fees collected from ship captains.¹⁰

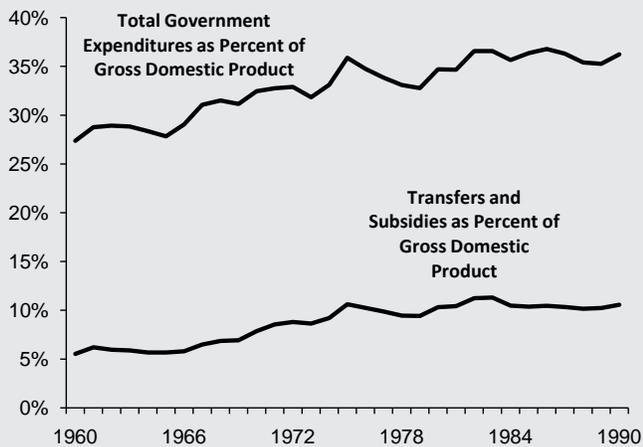
Most people believe that a government of a certain size is necessary for economic progress. Although it is legitimate to debate the cost in freedom and efficiency of state-provided services, some of these services do contribute to economic growth.¹¹ Expenditures on national defense, infrastructure, public health, schooling and protection of property and contract fall into this category. Much beyond these activities, however, the growth of government spending is primarily related to income redistribution.

Figure I
Optimal Rate of Taxation for the United States



Source: Author's calculations from the model; see the Appendix.

Figure II
Transfers and Subsidies
(1960–1990)



Source: Bureau of Economic Analysis; U.S. Department of Commerce.

The taxes levied to pay for such nonproductive government expenditures as benefit transfers and subsidies lower the growth rate.¹² In general, the taxes imposed (whether explicitly or implicitly through regulation and federal mandates) and the transfers and subsidies expended alter the prices in the economy and reallocate resources from their highest, privately employed use (the market allocation) to uses deemed more politically and socially acceptable.¹³ This reallocation lowers the growth rate. Thus, the government contributes to economic growth as it expands from a relatively low level but retards economic growth as it expands beyond an optimal point of taxation. This concept is now known as the *optimal size fiscal state*.¹⁴

In recent years, experts have tried to measure the growth-maximizing size of the fiscal state. Two models of growth-maximizing taxation have been developed: the Barro model and the Scully model [for details on both models see the Appendix].

Based on a model of economic growth and inequality developed by

the author (the Scully model), the optimal, or growth-maximizing, tax rate for the United States over the 1960–1990 period was an estimated 19.3 percent of gross domestic product (GDP).¹⁵ [See Figure I.] [See Appendix for model details.]

Over that period, however, federal, state and local gov-

ernments consumed a much higher percentage of GDP, and expenditures for transfers and subsidies roughly doubled. [See Figure II.] As a result, the economy (GDP) and per capita income grew more slowly than they would have if the growth of government had been constrained to the growth-maximizing level.

The model also shows that while the growth of real government consumption and investment expenditures over the 1960–1990 period contributed positively to economic growth (unlike transfers and subsidies), these expenditures were about one-fifth as productive as real private capital (physical and human) accumulation (0.22 compared with 1.11 and 0.96, respectively). Thus, at the margin, a dollar of public expenditure ought to have five times the rate of return of a dollar of private investment to justify the marginal dollar's worth of taxation to pay for it. Physical and human capital contribute equally to economic growth, suggesting that the rates of return are about equal.

Economic Growth and Income Inequality

The most popular single measure of income inequality is the Gini coefficient. The Gini coefficient measures the difference between the actual distribution of income among the population and an equal distribution of the income. The Gini coefficient is bound between 0 (a perfectly equal distribution of income) and 1 (a perfectly unequal distribution of income). If the Gini is equal to 0, everybody has exactly the same income. If the Gini is equal to 1, one person has all of the income, and the rest of the population has none. Thus, the higher the value of the Gini coefficient, the more income inequality in a society.

Income inequality in the United States has increased over the past few decades. Over the 1960–1990 period, the Gini coefficient ranged from a low of 0.335 (1968) to a high of 0.3816 (1989), a difference of 0.0466. Although an increase in economic growth is associated with a slight increase in inequality, research has shown that structural economic and social changes can have large effects on income inequality. These structural changes include changes in workers' accumulation of human capital (schooling and job skills), increasing earnings differentials associated with these differences in human capital and the changing demographic structure of households. The relative contribution of structural changes and economic growth to increasing inequality can be calculated by plugging values for these variables into a model of growth and inequality.

First, both the mean and median levels of schooling have been rising; the mean level of schooling in 1960 was 10.7 years, compared with 11.84 years in 1990, a rise of 1.12 years.¹⁶ Income differentials by schooling

level have grown, increasing the Gini coefficient.

Second, a substantial rise has occurred in the female labor force participation rate (FLR), and a less significant decline has occurred in the labor force participation rate of males.¹⁷ Earnings inequality is lower among two-earner households but has increased between two- and one-earner households. Moreover, rising female labor force participation is also associated with an increase in female-headed households. The participation of females in the labor force rose from 27.7 percent in 1960 to 57.5 percent in 1990.

Moreover, a well-documented female-male wage gap exists. A higher proportion of female-headed households with lower average earnings tends to increase the Gini coefficient over time, other things being equal.

Third, the Gini coefficient is lower during periods of low unemployment and higher during periods of high unemployment (as measured by the unemployment rate).¹⁸ Over the 1960–1990 period, the unemployment rate ranged from a low of 3.5 percent to a high of 9.7 percent.

Regression results from the Scully model show the effects of these variables on U.S. inequality over the 1960–1990 period:

- A one-year increase in education level increases the Gini coefficient by 0.048 points; thus the rise in average schooling (1.12 years) in the United States over the period was estimated to add 0.053 points, which is a substantial increase in income inequality.
- A 1 percentage-point increase in the female labor force participation rate increases the Gini coefficient by 0.001752; thus the rise in FLR of 19.8 percentage points increases the Gini coefficient by an estimated 0.035 points.

- Although unemployment is cyclical, it has a small positive effect on the Gini of 0.011 points.¹⁹
- Finally, a 1 percentage-point increase in economic growth increases the Gini coefficient by 0.00075 point, for example, from 0.35 to 0.35075.

Of particular interest here is the effect of economic growth on the Gini coefficient. It is positive and highly statistically significant, which indicates that a trade-off exists between economic growth and the income distribution.²⁰ However, the effect of this trade-off in the United States over the time period studied is rather small.

“Economic growth slightly increases inequality; but other factors have a much greater effect.”

Growth-Maximizing Income Inequality

Empirical evidence for the United States indicates that a switch from a relatively high tax-low growth regime to a relatively low tax-high growth regime was associated with a significant but very small increase in income inequality. Over the 1960–1990 period:

- At the mean (anticipated) tax rate of 30.7 percent, the growth rate predicted by the model was about equal to the observed mean GDP growth rate of 3.4 percent.
- At the optimal tax rate of 19.3 percent of GDP in the Scully model, the growth rate would have been 6.97 percent per year [see Figure I].²¹

- A 1 percentage point change in the growth rate was associated with a 0.00075 point change (say, from 0.35 to 0.35075) in the Gini coefficient.

Running the regression on the Gini variables in the Scully model yields the following results:

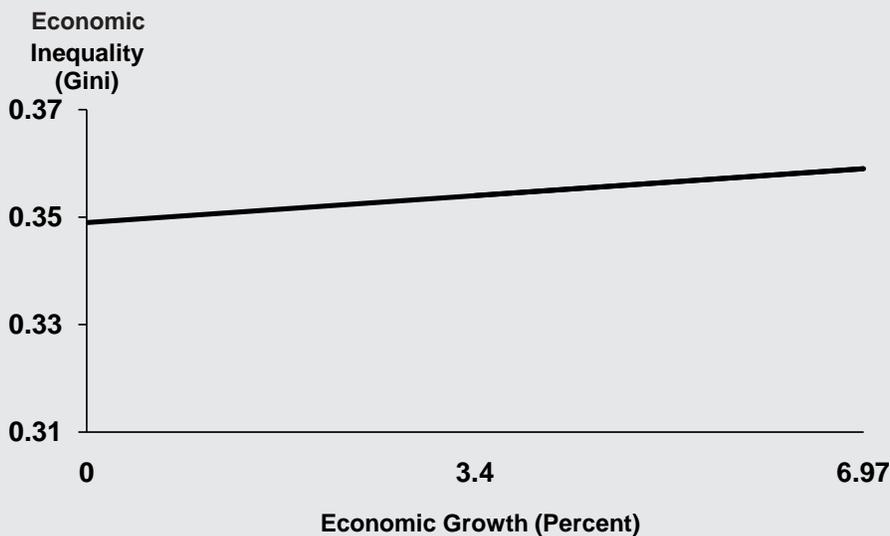
- The predicted Gini at a 3.4 percent growth rate is 0.354, which is very close to the actual mean Gini of 0.35 over the period.
- Lowering the tax rate to 19.3 percent of GDP and multiplying the coefficient of growth on the Gini by 6.97 percent raise the Gini to 0.359, its growth-maximizing level. [See Figure III.]

Another way of looking at the Gini coefficient is to examine what a reduction in income inequality costs. The results show that an improvement in the Gini of 0.001 costs 1.33 percent per year in per capita economic growth. Thus:

- Assuming a 3.4 percent annual growth rate, median household income (which was \$50,233 in 2007) would increase by nearly \$20,000 over 10 years.
- However, improving the Gini by 0.001 point per year would reduce the growth rate to 2.1 percent per year, and median household income would increase by only \$11,422.

But this increase in income inequality is trivial compared with the large difference in the growth of living standards associated with optimal or growth-maximizing taxation. Raising the U.S. rate of economic growth from its actual to its optimal size would approximately double the standard of living every 20 years. At the actual rate of growth, living standards take roughly 40 years to double.

Figure III
Relationship between Income Inequality and Economic Growth



Source: Author's calculations.

Policy Implications and Conclusions

Some policy implications arise from this research and the research of others cited in this study. First, the size of the government is too large. Government expenditures have risen to levels that reduce the rate of economic progress. The evidence appears to be that a fiscal size (federal, state and local taxation) in the range of 15 percent to 20 percent of GDP is about the share that maximizes the growth rate. Beyond that share, further public expenditure, which will consist mainly of unproductive income transfers and subsidies, lowers the growth rate. At 30 percent or so of GDP, government outlays cut the economic growth rate approximately in half. Therefore, robbing Peter to pay Paul harms not

only Peter but also Paul. Raising the U.S. rate of economic growth from its actual to its optimal size would result in approximately doubling the standard of living every 20 years. So, both Peter and Paul surrender a great deal of future income to pay for Paul's transfer payments and subsidies.

One is not particularly sanguine that much can be done to stop the ineluctable expansion of the state. In the current climate of global competition, U.S.-based production (both capital and labor) bears the costs of health care and retirement. Foreign competitors are free of these burdens, which are paid through general taxation. Facing imports that are cheaper, in part because of government-provided health care and retirement, and exports that are more expensive, in part because of

employer-provided health insurance and retirement, U.S. industries will demand relief from these burdens for reasons of global competitiveness. And growing middle-class alarm at the burden of health insurance will exert political pressure to provide some, if not all, health benefits at taxpayer expense. As with all past government programs, initially the role of government will be that which can be attained in the current political climate. This implies that initially some sort of subsidized universal health insurance eventually will be offered. Program creep will expand the government's rôle in the health system. If so, these public transfers will increase the size of the fiscal state to more than 40 percent or so of GDP, as it is in most of Europe. As the expense of such a program exhausts the will of Congress to continue financing ever-expanding demands for more government-provided health care benefits, some access and some care will be rationed. The expanded public claim on national output of a taxpayer-provided health care system will further lower the long-term growth rate.

A second policy implication is that politicians need to be less concerned about income inequality and more concerned about the prospects for economic growth. Earnings differentials by educational and skill level, male-female wage differences and two-earner and single-mother households are the main sources of the rise in income inequality in recent decades. Government can do little to alter these structural trends. Policies that tax success and subsidize failure harm the rate of economic progress and do little to alter the underlying structural income distribution. Such policies hardly advance economic well-being.

Appendix

Two models of growth-maximizing taxation have been developed: the Barro model²² and the Scully model.²³

The Barro model. In Barro's paper, government spending and taxation have opposite effects on economic growth. An increase in government consumption and investment spending raises the marginal productivity of capital, which increases the growth rate, but an increase in the tax rate lowers the growth rate.

In his model, output per worker, y , in a nonlinear framework, is:

$$y = kA(g/k)^\alpha,$$

where k and g represent capital and public services or government consumption expenditures per worker, respectively. Dividing both sides of the production function by k yields $y/k = A(g/k)^\alpha$. With this technology, the size of government that maximizes the growth rate is given by the condition $\alpha = g/y = \tau$, where τ is the tax rate.

Data on the variables were obtained for the period 1960–1990.²⁴ These variables are:

y/k = GDP/capital stock in constant (1987) prices and

g/k = all government (FSL) consumption and investment expenditures/capital stock in constant prices.

In a time series context, a number of issues arise about this type of specification. The first issue is whether these time series variables are stationary (that is, contain unit roots). Stationarity tests were performed on the variables. The result of these tests may be seen in Table 1 of the academic version of this study in *Public Choice*. The finding was that neither y/k nor g/k is stationary. Moreover, the order of integration differs for the two variables. A test of whether y/k and g/k (the residuals of the cointegrating regression) are cointegrated reveals that they are not cointegrated.

The second issue is that both variables are trending, which brings the prospect of spurious regression (that is, correlation arising from common trend). The regression of y/k and g/k on trend reveals that both series contain trend, with possibly spurious results in estimation of the optimal tax rate.

In light of these findings, it is appropriate to filter both series by removing the trend in them. The detrended values are designated as $(y/k)^\circ$ and $(g/k)^\circ$. With the trend removed, the variables are cointegrated.

The third issue is that these variables are autocorrelated (that is, contain nonrandom cycles in the residuals). Hence, estimation of the equation is with a correction for first-order serial correlation.

The parameters of the model were estimated for the period 1960–1990. The point estimate for the growth-maximizing tax rate is 25.1 percent of GDP, but the coefficient estimate is not statistically significant.²⁵ In further analysis, Barro subdivides government spending into a portion that is productive and a portion that is pure government consumption services to households (that is, mainly transfer payments): $\tau_g = g/y$ and $\tau_h = h/y$. In a cross-country context, Barro found a statistically significant inverse relationship between nonproductive government spending and the growth rate and a positive but insignificant association between productive spending and growth.²⁶ He interprets the second result as some evidence that governments typically come close to spending a share of GDP on publicly provided productive services that maximizes the growth rate, although the evidence for such a sweeping conclusion seems rather thin.

For nonproductive government spending in the United States, the series on federal, state and local (FSL) transfer payments in 1987 dollars is used.²⁷ Because h/y and h/k contain trend, the series h/k was detrended and is designated $(h/k)^\circ$. No attempt is made to remove any nonproductive spending from the government consumption and investment series because this is not possible. The result of estimating this version of the Barro model is that government productive spending contributes positively but not statistically significantly to economic growth in the United States and that nonproductive spending contributes negatively and statistically significantly to economic growth.²⁸

Tests on the residuals reveal that they are nonstationary. Thus, the series are drifting apart, and the distance between them is growing. The regression result needs to be taken with reservation. The result indicates that nonproductive government spending lowers economic growth in a statistically significant way and that productive spending raises the growth rate, although the parameter is not statistically different from zero. Thus, my results based on U.S. time series data support Barro's findings, which were based on cross-national data.

The Scully model. In the Scully model, total tax (that is, federal, state and local [FSL]) as a share of GDP is related to the growth rate. It is taken that at low levels of government spending as a share of GDP, an increase in the

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tax rate, τ , raises the growth rate because what is being provided (infrastructure, education, public health, protection of property) is productive. At high levels of government spending, the character of government spending is more toward nonproductive spending (such as welfare payments), and increases in the tax rate lower the growth rate.

The basic model is:²⁹

$$1 + g_Y = a\tau^b(1 - \tau)^{1-b}.$$

Differentiating the growth rate, g_Y , with respect to the tax rate, τ , yields:

$$\partial g_Y / \partial \tau = a\tau^{b-1}(1 - \tau)^{-b}(b - \tau).$$

The optimal tax rate, τ^* , is equal to the parameter b .

In the derivation of the Scully model, as with the earlier Barro model, a balanced budget constraint is imposed:

$$G/Y = \tau.$$

Because government in the United States has been in deficit for many years over this period, the anticipated tax rate G/Y , rather than the actual tax rate, T/Y , is used, where:

$$\tau = \text{government (FSL) consumption and investment spending} + \text{government (FSL) transfer payments} / \text{GDP}.$$

It makes relatively little difference whether G/Y or T/Y is used in the empirical estimation. With T/Y as the independent variable, the growth-maximizing tax rate is 0.18 and is statistically significant.

Trade-off between income inequality and economic growth. The model of the trade-off between income inequality and economic growth contains two equations: one for the variables that determine economic growth and one for the variables that affect income inequality. Economic growth is modeled in a strictly neoclassical fashion. The growth rate of real GDP is related to the growth of the real capital stock (g_k), the growth rate of the real stock of human capital (g_{hc}) and the growth rate of real government consumption and investment expenditures (g_{gcon}).³⁰

$$g_Y = f(g_k, g_{hc}, g_{gcon})$$

Income inequality is measured by the Gini coefficient.³¹ The Gini coefficient is the most widely used measure of income inequality. The value lies between 0 and 1, and higher the value of the Gini coefficient, the more inequality of income exists. Thus, the equity (EQ) equation is:

$$EQ = h(S, FLR, U, t, g_Y) [S, FLR, U, t, g_k, g_{hc}, g_{gcon}].$$

The dependent variable GINI is bounded in the unit interval, and as such the regression cannot have normally distributed residuals. A solution is to convert the variable to a log-odds transformation — that is, $\ln(y/(1 - y))$. A disadvantage of such a transformation is that it makes difficult discussion and interpretation of the regression coefficients of interest. This can be remedied by converting back to an arithmetical value calculated at the mean.³²

Results. Estimation of the parameters of the system model yielded solid and statistically significant results. Reasonably good statistical results are obtained for the growth equation. Because *a priori* all of the coefficients are positive, on a one-tail test all are statistically significant above the 95 percent level. The residuals are free of autocorrelation. Further tests were performed on the residuals, and they were found to be stationary.

In the growth rate regression, the growth rate of real government consumption and investment expenditures contributes positively to economic growth, but the size of the coefficient is about one-fifth of the effect of that of the growth rate of real private capital (physical and human).³³ Therefore, at the margin, a dollar of public expenditure ought to have five times the return of a dollar of private investment to justify the marginal dollar's worth of tax to pay for it. Physical and human capital contribute equally to economic growth, suggesting that the rates of return are about equal.

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.

Notes

- ¹ Richard Musgrave is recognized as the founding father of modern public finance theory. See Richard A. Musgrave, *The Theory of Public Finance* (New York, N.Y.: McGraw Hill, 1959).
- ² A widely recognized problem with fiscal stabilization policy is that when Congress finally gets around to passing a stimulus package of tax cuts and/or expenditure increases when there is a recession or tax increases and/or public expenditure reductions when there is full employment-inflationary pressure, it is most often too late. In these instances, the poor timing of the fiscal policy change may do more harm than good. On monetary policy, Federal Reserve changes in interest rates to stimulate or dampen economic growth work with long lags. While much progress has been made in controlling the path of economic growth through monetary policy, reading the data and timing the interest rate changes are inexact tools. With the federal government running a large budget deficit and with external trade in continuous and large deficits, the Federal Reserve cannot affect all of the main monetary instruments simultaneously — that is, control the rate of inflation, raise or lower the interest rate and strengthen or weaken the exchange rate of the U.S. dollar. In other words, one cannot have a strong dollar, a positive foreign trade balance and low inflation at the same time.
- ³ See Daniel Landau, “Government Expenditure and Economic Growth: A Cross-Country Study,” *Southern Economic Journal*, Vol. 49, No. 3, January 1983, pages 783–792; Edgar A. Peden and Michael D. Bradley, “Government Size, Productivity, and Economic Growth: The Post-War Experience,” *Public Choice*, Vol. 61, 1989, pages 229–245; Gerald W. Scully, “The Size of the State, Economic Growth and the Efficient Utilization of National Resources,” *Public Choice*, Vol. 63, 1989, pages 149–164; Gerald W. Scully, “The ‘Growth Tax’ in the United States,” *Public Choice*, Vol. 85, 1995, pages 71–80; Gerald W. Scully, “Taxation and Economic Growth in New Zealand,” *Pacific Economic Review*, Vol. 1, 1996, pages 169–177; and Robert J. Barro, “Government Spending in a Simple Model of Endogenous Growth,” *Journal of Political Economy*, Vol. 98, No. 5, 1990, pages S103–S125.
- ⁴ Hansson and Henrekson give several arguments on why government expenditure may have a positive effect on economic growth; Par Hansson and Magnus Henrekson, “A New Framework for Testing the Effect of Government Spending on Growth and Productivity,” *Public Choice*, Vol. 81, 1994, pages 381–401. Gwartney, Lawson, and Holcombe argue that the rule of law, infrastructure and public goods are essential for the functioning of a market economy but that beyond these core functions further spending adversely affects growth; James Gwartney, Robert Lawson and Randall Holcombe, “The Size and Functions of Government and Economic Growth,” Joint Economic Committee, April 1998, available at <http://www.house.gov/jec/growth/function/function.pdf>. Compare this with Joel Slemrod, William G. Gale and William Easterly, “What Do Cross-Country Studies Teach about Government Involvement, Prosperity, and Economic Growth?” *Brookings Papers on Economic Activity*, Vol. 1995, No. 2, 1995, pages 373–415.
- ⁵ Arthur M. Okun, *Equality and Efficiency* (Washington, D.C.: Brookings Institution, 1975); Gerald W. Scully, “Rights, Equity, and Economic Efficiency,” *Public Choice*, Vol. 68, 1991, pages 195–215.
- ⁶ For empirical evidence supporting the optimal tax rate theory and the trade-off between income inequality and economic growth, see Gerald W. Scully, “Taxes and Economic Growth,” National Center for Policy Analysis, Policy Report No. 292, November 2006; Gerald W. Scully, “Economic Freedom and the Trade-Off between Inequality and Growth,” National Center for Policy Analysis, Policy Report No. 309, March 31, 2008.
- ⁷ For further discussion of technical statistical issues, see Gerald W. Scully, “Optimal Taxation, Economic Growth and Income Inequality,” *Public Choice*, Vol. 115, 2003, pages 299–312.
- ⁸ The main arguments for government provision rest on a lack of exclusivity, on the unwillingness of individuals to reveal their preferences for such goods and on externalities. Thus, when the bombs start falling from an enemy, one cannot exclude those who did not pay for national defense. If surveyed on willingness to pay, people will understate their desire for the public good. Collectively, such understatement would lead to an underproduction of the public good. In the case of, say, education, particularly at the grammar and high school levels, reading, writing and a sense of our history and the nature of democracy and politics make for an educated voter, which benefits all. Such external benefits are not included in the price of education. See Paul A. Samuelson, “The Pure Theory of Public Expenditure,” *Review of Economics and Statistics*, Vol. 36, 1954, pages 387–389.
- ⁹ James M. Buchanan, “An Economic Theory of Clubs,” *Economica*, Vol. 32, 1965, pages 1–14.
- ¹⁰ In the 19th century, the British government took over the lighthouses. Ronald H. Coase, “The Lighthouse in Economics,” *Journal of Law and Economics*, Vol. 17, 1974, pages 357–376.
- ¹¹ This is not to deny that a whole host of services provided by government can be provided by private entities (toll roads, education, garbage collection, fire and some policing services, operation and management of forests, parks and so on). Some expansion of private provision has occurred over the last several decades by reason of public budgetary constraints, not by reason of a philosophical consideration that certain services should be provided by private entities competing to provide them. Thus, such activities as garbage collection paid for by a fee rather than by taxes, a toll road built because the public authority does not have the money to build and maintain a free public highway and so on occur.

Optimal Taxation, Economic Growth and Income Inequality in the United States

- ¹² Generally, no studies find that higher taxes are associated with economic growth. See, for example, Reinhard B. Koester and Roger C. Kormendi, "Taxation, Aggregate Activity and Economic Growth: Cross-Country Evidence on Some Supply-Side Hypotheses," *Economic Inquiry*, Vol. 27, 1989, pages 367–386; and Narayana R. Kocherlakota and Kei-Mu Yi, "A Simple Time Series Test of Endogenous vs. Exogenous Growth Models: An Application to the United States," *Review of Economics and Statistics*, Vol. 78, 1996, pages 126–134.
- ¹³ Certain social benefits (costs) can be increased (lowered) by government fiscal intervention, and market failures can be mitigated by government activity. Lacking much evidence, how much government fiscal activity and intervention are required is an open empirical question.
- ¹⁴ Scully, "Optimal Taxation, Economic Growth and Income Inequality."
- ¹⁵ Ibid. One might have wished for more recent data. However, much of the data utilized in this study are available only to 1990. It is highly unlikely that the addition of more recent data would change the empirical results to any important degree.
- ¹⁶ Vikram Nehru and Ashok Dhareshwar, "A New Database on Physical Capital Stock: Sources, Methodology and Results," *Revista de Analisis Economico*, Vol. 8, 1993, pages 37–59.
- ¹⁷ The data on the female labor force participation rate are from *Economic Report of the President 1996* (Washington, D.C.: Government Printing Office, 1996), available at <http://www.gpoaccess.gov/usbudget/fy97/pdf/erp.pdf>.
- ¹⁸ For the finding of the link between unemployment and income inequality, see Gerald W. Scully and Daniel J. Slottje, "The Paradox of Politics and Policy in Redistributing Income," *Public Choice*, Vol. 60, 1989, pages 55–70. The data on the unemployment rate are from *Economic Report of the President 1996*.
- ¹⁹ Based on Okun's law, the growth rate and the unemployment rate are related. However, for this time period the statistical relationship is quite weak (a zero order correlation of 0.33, which is not significant at the 0.95 percent level). Moreover, when the trend is removed from the unemployment rate, the statistical significance of the regression coefficient drops well below minimum statistical significance.
- ²⁰ Forbes, using a sample of 45 countries (1966–1995, five-year intervals), and Scully, using a sample of advanced industrial and rapidly industrializing Asian nations (1975–1990, five-year intervals), found a positive, statistically significant, but small trade-off between economic growth and the income distribution. See Kristin J. Forbes, "A Reassessment of the Relationship between Inequality and Growth," *American Economic Review*, Vol. 90, 2000, pages 869–887; Gerald W. Scully, "Economic Freedom, Government Policy and the Trade-Off between Equity and Economic Growth," *Public Choice*, Vol. 113, 2002, pages 77–96; Gerald W. Scully, "Economic Freedom and the Trade-Off between Inequality and Growth."
- ²¹ Scully, "Optimal Taxation, Economic Growth and Income Inequality."
- ²² Barro, "Government Spending in a Simple Model of Endogenous Growth."
- ²³ Scully, "The 'Growth Tax' in the United States"; and Scully, "Taxation and Economic Growth in New Zealand."
- ²⁴ The data for GDP and FSL government and investment expenditure are from *Economic Report of the President 1996*. Data on capital stock are from Nehru and Dhareshwar, "A New Database on Physical Capital Stock: Sources, Methodology and Results."
- ²⁵ Specifically, the estimated value of the α coefficient is 0.2511 with a standard error of 0.1641. This degree of error is too large to attach statistical significance to the coefficient value.
- ²⁶ Kneller, Bleaney and Gemmell find for OECD countries that "productive" government expenditure increases economic growth whereas nonproductive spending does not. See Richard Kneller, Michael F. Bleaney and Norman Gemmell, "Fiscal Policy and Growth: Evidence from OECD Countries," *Journal of Public Economics*, Vol. 74, 1999, pages 171–190.
- ²⁷ Data are from *Economic Report of the President 1996*.
- ²⁸ Specifically, the coefficient of productive government expenditure on growth is 0.1450 with a standard error of 0.1330. The coefficient of nonproductive government expenditure on growth is -0.1868 with a standard error of 0.0526.
- ²⁹ For the development of the model, see Scully, "Taxation and Economic Growth in New Zealand."
- ³⁰ Human capital is estimated as total civilian employment times mean years of schooling, from Nehru and Dhareshwar, "A New Database on Physical Capital Stock: Sources, Methodology and Results." The data on capital stock are also from Nehru and Dhareshwar. GDP and FSL government consumption and investment expenditure are from *Economic Report of the President 1996*.
- ³¹ The data on the Gini coefficient are from Klaus Deininger and Lyn Squire, "A New Data Set Measuring Income Inequality," *World Bank Economic Review*, Vol. 10, 1996, pages 565–591.
- ³² The procedure is to multiply the regression coefficient (the estimated parameter) by the mean GINI times one minus the mean Gini.
- ³³ The estimated parameters with their standard errors in parentheses are as follows: for government expenditure growth, 0.22 (0.12); for capital growth, 1.11 (0.63); and for human capital growth, 0.96 (0.24). Thus, physical and human capital growth yield about equivalent effects on economic growth; for example, a 1 percentage-point increase in capital accumulation yields about a 1 percent increase in per capita GDP growth.

About The NCPA

The NCPA is a nonprofit, nonpartisan organization established in 1983. Its aim is to examine public policies in areas that have a significant impact on the lives of all Americans — retirement, health care, education, taxes, the economy, the environment — and to propose innovative, market-driven solutions. The NCPA seeks to unleash the power of ideas for positive change by identifying, encouraging and aggressively marketing the best scholarly research.

Health Care Policy.

The NCPA is probably best known for developing the concept of Health Savings Accounts (HSAs), previously known as Medical Savings Accounts (MSAs). NCPA President John C. Goodman is widely acknowledged (*Wall Street Journal*, *WebMD* and the *National Journal*) as the “Father of HSAs.” NCPA research, public education and briefings for members of Congress and the White House staff helped lead Congress to approve a pilot MSA program for small businesses and the self-employed in 1996 and to vote in 1997 to allow Medicare beneficiaries to have MSAs. In 2003, as part of Medicare reform, Congress and the President made HSAs available to all nonseniors, potentially revolutionizing the entire health care industry. HSAs now are potentially available to 250 million nonelderly Americans.

The NCPA outlined the concept of using federal tax credits to encourage private health insurance and helped formulate bipartisan proposals in both the Senate and the House. The NCPA and BlueCross BlueShield of Texas developed a plan to use money that federal, state and local governments now spend on indigent health care to help the poor purchase health insurance. The SPN Medicaid Exchange, an initiative of the NCPA for the State Policy Network, is identifying and sharing the best ideas for health care reform with researchers and policymakers in every state.

**NCPA President
John C. Goodman is called the
“Father of HSAs” by *The Wall
Street Journal*, *WebMD* and the
National Journal.**

Taxes & Economic Growth.

The NCPA helped shape the pro-growth approach to tax policy during the 1990s. A package of tax cuts designed by the NCPA and the U.S. Chamber of Commerce in 1991 became the core of the Contract with America in 1994. Three of the five proposals (capital gains tax cut, Roth IRA and eliminating the Social Security earnings penalty) became law. A fourth proposal — rolling back the tax on Social Security benefits — passed the House of Representatives in summer 2002. The NCPA’s proposal for an across-the-board tax cut became the centerpiece of President Bush’s tax cut proposals.

NCPA research demonstrates the benefits of shifting the tax burden on work and productive investment to consumption. An NCPA study by Boston University economist Laurence Kotlikoff analyzed three versions of a consumption tax: a flat tax, a value-added tax and a national sales tax. Based on this work, Dr. Goodman wrote a full-page editorial for *Forbes* (“A Kinder, Gentler Flat Tax”) advocating a version of the flat tax that is both progressive and fair.

A major NCPA study, “Wealth, Inheritance and the Estate Tax,” completely undermines the claim by proponents of the estate tax that it prevents the concentration of wealth in the hands of financial dynasties. Actually, the contribution of inheritances to the distribution of wealth in the United States is surprisingly small. Senate Majority Leader Bill Frist (R-TN) and Senator Jon Kyl (R-AZ) distributed a letter to their colleagues about the study. In his letter, Sen. Frist said, “I hope this report will offer you a fresh perspective on the merits of this issue. Now is the time for us to do something about the death tax.”

Retirement Reform.

With a grant from the NCPA, economists at Texas A&M University developed a model to evaluate the future of Social Security and Medicare, working under the direction of Thomas R. Saving, who for years was one of two private-sector trustees of Social Security and Medicare.

The NCPA study, “Ten Steps to Baby Boomer Retirement,” shows that as 77 million baby boomers begin to retire, the nation’s institutions are totally unprepared. Promises made under Social Security, Medicare and Medicaid are completely unfunded. Private sector institutions are not doing better — millions of workers are discovering that their defined benefit pensions are unfunded and that employers are retrenching on post-retirement health care promises.

Pension Reform.

Pension reforms signed into law include ideas to improve 401(k)s developed and proposed by the NCPA and the Brookings Institution. Among the NCPA/Brookings 401(k) reforms are automatic enrollment of employees into companies’ 401(k) plans, automatic contribution rate increases so that workers’ contributions grow with their wages, and better default investment options for workers who do not make an investment choice.

The NCPA's online Social Security calculator allows visitors to discover their expected taxes and benefits and how much they would have accumulated had their taxes been invested privately.

Environment & Energy.

The NCPA's E-Team is one of the largest collections of energy and environmental policy experts and scientists who believe that sound science, economic prosperity and protecting the environment are compatible. The team seeks to correct misinformation and promote sensible solutions to energy and environment problems. A pathbreaking 2001 NCPA study showed that the costs of the Kyoto agreement to reduce carbon emissions in developed countries would far exceed any benefits.

Educating the next generation.

The NCPA's Debate Central is the most comprehensive online site for free information for 400,000 U.S. high school debaters. In 2006, the site drew more than one million hits per month. Debate Central received the prestigious Templeton Freedom Prize for Student Outreach.

Promoting Ideas.

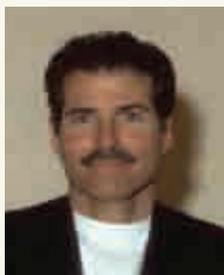
NCPA studies, ideas and experts are quoted frequently in news stories nationwide. Columns written by NCPA scholars appear regularly in national publications such as the *Wall Street Journal*, the *Washington Times*, *USA Today* and many other major-market daily newspapers, as well as on radio talk shows, on television public affairs programs, and in public policy newsletters. According to media figures from Burrelle's, more than 900,000 people daily read or hear about NCPA ideas and activities somewhere in the United States.

What Others Say About the NCPA



"The NCPA generates more analysis per dollar than any think tank in the country. It does an amazingly good job of going out and finding the right things and talking about them in intelligent ways."

Newt Gingrich,
former Speaker of the U.S. House
of Representatives



"We know what works. It's what the NCPA talks about: limited government, economic freedom; things like health savings accounts. These things work, allowing people choices. We've seen how this created America."

John Stossel,
co-anchor ABC-TV's 20/20



"I don't know of any organization in America that produces better ideas with less money than the NCPA."

Phil Gramm,
former U.S. Senator



"Thank you . . . for advocating such radical causes as balanced budgets, limited government and tax reform, and to be able to try and bring power back to the people."

Tommy Thompson,
former Secretary of Health and
Human Services