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Tax Policy and Economic Growth in the States

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INTRODUCTION

In debates regarding the scope of government and fiscal policy, the issue often considered is *how* the economy is affected by taxes. If taxes increase, is the economy improved? Or is the economy negatively affected? This is an empirical question that can be investigated by looking at taxes and economic growth rates across the states. Economists Barry Poulson and Jules Kaplan look at this very issue in a statistical study of the relationship between tax policy among the various states and states' economic growth rates.

To sum up this study, Dr. Poulson and Dr. Kaplan found that the more rapidly taxes rise with increases in income, whether on an absolute or percentage basis, the lower will be a state's economic growth rate. In addition, the presence of a state income tax has a negative effect on a state's growth rate as well. These results are economically intuitive and explained in detail in the following pages.

HOW TAXES AFFECT ECONOMIC GROWTH

It certainly seems reasonable that the answer to "how taxes affect economic growth" should depend at least partly on how government spends the money. However, partly due to the influence of the federal government, states are increasingly homogenous in how they spend taxpayers' funds. What can differ greatly are the types and levels of taxation in the various states. To be sure, how funds are spent is a question deserving investigation, but the goal of this study is to understand the relationship between economic growth and tax policy.

Because the United States is a completely open economy across the states, one phenomenon that can mask the relationship between tax levels and economic growth is something called "convergence." The idea is that regardless of the tax policies followed, all the states tend to converge toward a single growth rate. This is another way of saying that investment and resources move around relatively freely among the states so as to equalize rates of return.

Another phenomenon related to the convergence issue is that states with relatively low income levels will tend to grow faster than those with already high income levels. Income levels, like growth rates, converge. Texas, for example, would have a tendency to grow faster than New York partly because Texas' income level is lower than that of New York, and there is a natural tendency for Texas to catch up.

Looking at any historical period, one would expect that states with higher levels of income at the beginning of that period would have lower growth rates than states with lower levels of income. In fact, this is exactly what this study found. By measuring this effect, the effects of tax policies can be more reliably measured.

Tax policies can retard or accelerate a state's growth rate and affect how soon it might converge with other states in terms of its growth and absolute income levels. In their statistical analysis, Dr. Poulson and Dr. Kaplan analyze several tax variables.

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One variable investigated is the marginal tax rate. This tells us how much taxes increase when personal income in a state increases by a given amount. This study looks at the entirety of the state and local tax systems in a given state. Thus, the marginal tax rate being measured is not one for any single tax and not all taxes are conducive to direct investigation of the marginal tax rate with respect to personal income. Therefore, the marginal tax rate for each state is statistically derived from historical tax and income data.

Talking*Point*:

A higher marginal tax rate implies that an income earner gets to keep a lower proportion of an additional income earned. That is, a higher marginal tax rate discourages work and investment by reducing the rewards for such behavior.

Economic theory would tell us that a higher marginal tax rate would tend to reduce economic growth. This is because a higher marginal tax rate implies that an income earner gets to keep a lower proportion of an additional income earned. That is, a higher marginal tax rate discourages work and investment by reducing the rewards for such behavior.

In their analysis, Dr. Poulson and Dr. Kaplan estimate that increases in the marginal tax rate had a significant *negative* impact on economic growth in the states. For all 50 states, a 1 percent increase in a state's marginal tax rate on average reduced the growth rate 3.6 percent.

Texas' marginal tax rate (see Appendix 5) is 9.37 percent. This means that when personal income increases by $100, state and local tax revenues in Texas can be expected to increase by $9.37. Texas is ranked 45th among the states with respect to its marginal tax rate. At number one, New York's marginal tax rate is 13.46 percent, 44 percent higher than that of Texas.

As in all states, increases in the marginal tax rate had a significant negative impact on economic growth in Texas. An increase of 1 percent in the marginal tax rate reduced the growth rate 2.64 percent. This negative impact is somewhat lower than that for other states because Texas does not have an income tax; and also, because Texas experienced a somewhat lower growth rate compared to most states.

The study isolates the effect of income taxes on economic growth in the states. The majority of states have now introduced an income tax, and rely on income tax revenues as the major source of revenue. Over the last four decades income tax revenues have displaced sales tax revenues as the major source of tax revenues in the states. While there has been convergence in income tax rates, wide disparities remain in income tax rates imposed by different states. The analysis shows that income taxes had a significant negative impact on economic growth rates in the states. The study estimates that if Texas had relied on an income tax rather than alternative taxes to generate a given level of revenue, this would have reduced the growth rate approximately .5 percent.

In order to isolate the effect of marginal tax rates on economic growth in the states, Dr. Poulson and Dr. Kaplan introduce a refinement that is now standard in such studies. They control for other fiscal policies that might bias the effects of tax policy. They do this by controlling for regressivity of the tax system. In effect, this approach assumes revenue neutral change in tax policy—i.e., any change in tax policy is offset by other changes in taxes so as to leave total revenues and expenditures unchanged. The effect of revenue neutral marginal tax rates is estimated assuming that the budget is balanced without expenditures, transfers, or non-tax revenue changes.

To control for regressivity the authors introduce a measure of relative regressivity in state tax systems. It could just as easily be called relative progressivity. Mathematically, it divides a state's average tax rate by the state's marginal tax rate. The average tax

rate is simply the ratio of total state and local taxes divided by total personal income.

Some additional algebra shows that the relative regressivity measure is equivalent to the ratio of two percentage changes—the percentage change in personal income divided by the percentage change in taxes. As noted above, it is expected, on the aggregate, that when personal income increases, tax revenues will inevitably increase as well in virtually any kind of tax system. Relative regressivity measures the percentage change in each.

Relative regressivity is different from the marginal tax rate. The marginal tax rate looks at absolute changes in personal income taxes. Relative regressivity measures the percentage changes. Two states with equivalent marginal tax rates could have very different income and tax levels and, therefore, very different relative regressivity measures.

If a relative regressivity ratio is greater than one, a 10 percent increase in income results in a less than 10 percent increase in taxes—a fairly regressive outcome overall because taxes would be falling as a percentage of income as income increases. If a relative regressivity ratio is less than one, a 10 percent increase in income results in a more than 10 percent increase in taxes—a fairly progressive outcome since taxes would be rising as a percentage of income.

Economic theory says that if a tax system is constructed so that taxes increase at a faster rate than income when income increases, this discourages work effort and therefore tends to reduce economic growth. Therefore, from an economic growth point of view, it is better for relative regressivity to be higher rather than lower. This study statistically confirms this theory. Greater relative regressivity results in a higher growth rate.

Texas has a less than average level of relative regressivity among the states. In fact, since Texas' relative regressivity ratio is less than one, it implies that Texas' state and local tax system is relatively progressive on the whole. Only 21 states have more progressive systems than Texas. These include states like Ohio (the most progressive), Hawaii, Arkansas, Connecticut, and Oklahoma—not exactly stellar examples of economic growth. On the other hand, California, Colorado, Nevada, Michigan, Arizona, and Tennessee are all among the 17 states that have relatively regressive tax systems.

POLICY IMPLICATION – EXPENDITURE LIMITS

If a policymaker's goal is to encourage economic growth and the self-sufficiency of families and individuals that come with it, this study implies certain policies should be followed. Taxes must be kept low. Taxpayers must not be penalized for moving up the economic ladder. Growth in personal income must not be taxed at an increasing rate. Income taxes must be avoided. The best way to achieve all of these is through comprehensive expenditure limits at the state and local levels.

By keeping expenditures low, taxes can be kept low. By keeping expenditures from rising rapidly, taxes can be kept from rising rapidly as income increases. Income taxes and their close cousins can be avoided as well.

The only state that has no income tax but has a more progressive tax system than Texas, according to the data in this study, is Florida. How can a state without an income tax have a progressive tax system? This has to do with the types of taxes and what people do with their money when they gain income.

The two dominant types of taxes in Texas are the sales tax and the property tax. When incomes rise, people do two things more than anything else. They consume more things

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and more expensive things. They also buy a home. Property taxes are especially high in Texas. Sales taxes are high as well. In particular, property tax rates in have risen rapidly in recent years. All of these circumstances combine to cause Texas to have a more progressive tax system than is immediately obvious.

Because property taxes are local, the results of this study strongly imply that expenditure limits need to be applied across the board —at the local level as well as the state level. Expenditure limits are crucial to protect the future economic growth of Texas. Texas' relative level of growth has been slower than it should be. No doubt, this is because Texas' marginal tax rate is high relative to its average tax rate—that is, Texas' economic growth rate is low because its tax system is excessively progressive.

TAX POLICY AND ECONOMIC GROWTH IN THE STATES

Tax Policy in the States

In recent years there has been a clear divergence in economic growth in the states. Some states are overachievers, with growth rates above the national average; while other states are underachievers. This divergence in growth rates is reflected in a divergence in levels of income per capita over time.

It is argued that tax and fiscal policies play an important role in the ability of states to achieve high and sustained rates of economic growth. Clearly there are major differences in the tax and fiscal policies pursued in the different states.

Some states, such as Tennessee, rely heavily on sales taxes as an alternative to income taxes as a source of revenue. While this reliance on sales taxes is often criticized, it is not clear that these criticisms are valid.

Other states, such as Ohio, have increasingly relied on a progressive income tax which has resulted in a significant increase in the tax burden. Other states, such as Colorado, have replaced a progressive income tax with a flat rate tax, and in the process have lowered the income tax burden.

There is a property tax revolt underway in some states, not unlike that experienced in the 1970s. In many jurisdictions property taxes have been increasing at double digit rates, reflecting both increases in property values and increased property tax rates. The property tax revolt is especially important in state and local jurisdictions that rely heavily on property tax revenues rather than income tax revenues, e.g., Texas.

Tax and spending limits—and other fiscal discipline measures—have been enacted at both the state and local level in many of these states. It is argued that these fiscal discipline measures have reduced the tax burden and contributed to higher rates of economic growth in those states.

Different approaches have been used to analyze the impact of tax policy on economic growth in the states. For example, the Tax Foundation constructs an index of tax policy to assess the business climate in the states.[1] The Tax Foundation maintains that if states want to achieve high and sustained rates of economic growth, they must create a business tax climate conducive to business investment and job creation. This requires tax policies that are competitive with those enacted in other states. It also requires fiscal discipline measures that constrain the growth of government revenue and spending relative to the private sector, and that enable the state to maintain a low tax burden.

The criticism of the Tax Foundation approach is that it does not take into account

other factors that influence the growth performance of the states. Many factors have contributed to the divergence in the growth experience of different states. For example, some states with a heavy concentration of traditional manufacturing industries have experienced retardation in growth, as output and employment in those industries has stagnated and declined. It has been difficult to separate out these other factors influencing economic growth from tax and fiscal policies pursued by different states. There is an extensive body of economics literature that utilizes econometric techniques to measure the impact of tax and fiscal policies on economic growth.[2] There are a number of methodological issues in this econometric research.

Legislators at the state and local level frequently argue that they are pursuing fiscal policies to promote economic growth. While policymakers believe that fiscal policies matter for long term economic growth, this has not always been true for economists. Until recently, economists assumed that long-term economic growth was determined by exogenous variables such as population growth and technological change. Public policy, including fiscal policy, was assumed to have only a temporary impact on economic growth.

These growth models, referred to as exogenous growth models, assumed that all states would converge toward the same long-run growth rate. If all states have the same resources and technology, and the factors of production are mobile between the states, the model predicts convergence of growth rates in the long-run.

However, more recent research on economic growth in the states suggests that policymakers are right. The new models of economic growth incorporate public policy as an important determinant of growth. These models, referred to as endogenous growth models, allow for the impact of fiscal policy on economic growth.

In these new growth models, convergence of growth rates in the states is not automatic. When state and local governments pursue more prudent fiscal policies, this can result in long-run growth rates that are significantly above that for states which follow more profligate fiscal policies.

This study explores the impact of tax policy on economic growth in the states within the framework of an endogenous growth model.[3] To understand the motivation for this research it is important to explore the economic theory underlying endogenous growth models.

Endogenous Growth Theory and Tax Policy in the States

In exogenous growth models it is assumed that output is increased with diminishing returns to capital. This means that increases in output become smaller as the amount of the capital input is increased. As the stock of capital rises the return to capital falls until investment is no longer profitable.

In exogenous growth models, if there is mobility of capital between states then diminishing returns to capital will cause convergence of output. Capital will flow from states with higher initial capital stocks and lower returns toward capital poor states. The result will be an increase in return to capital in low return states, and a decrease in high return states. As the returns to capital converge, states adjust to a common steady state growth rate. The steady state growth rate is a function of technology, resources, and demographics, which are assumed to be exogenous. If there are barriers to the mobility of factors between states, this may prevent equalization of returns. Individual states may have different access to technology and resources, or may be at different stages in the

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demographic transition. These differences could lead to different steady state growth rates and non-convergence.

In endogenous growth models the assumption is that there are no diminishing returns to capital. Capital accumulation can take place without falling returns to capital. Thus investment and economic growth are sustainable in the long-run. Alternative explanations are offered for factors that offset diminishing returns to capital. Some studies focus on investments in human capital and increases in the stock of knowledge. Other studies emphasize technology changes and the process of invention and innovation that underlie technology change.

In endogenous growth models steady state rates of growth among states may or may not converge. Different rates of return to capital between the states may persist in the long-run. Exogenous shocks may also be large enough to put states continuously on an adjustment path to unique, steady state growth rates. On the other hand, factor flows between the states would tend to equilibrate rates of return and lead to convergence in long-run equilibrium growth rates.

Within the endogenous growth model framework, whether or not there is convergence in growth rates between the states is an empirical question. Recent empirical evidence reveals convergence in growth rates between the states.[4] For example, the southern states, with low initial income per capita, are among the fastest growing states.

Regression analysis is often used to test the relationship between steady state growth rates and initial income.[5] These regressions, referred to as Barro regressions, test the convergence hypothesis. Recent regression studies for the states reveal a negative correlation between growth rates and initial income. This evidence of convergence in growth rates is significant even when other exogenous factors that influence growth rates are introduced in the regression analysis.

The regression test for convergence has been criticized in the economics literature. In particular, these studies cannot determine whether the states are converging toward a singly steady state growth rate, or whether individual states are converging toward unique steady state growth rates. The latter is referred to as conditional convergence.

What is important for this study is that this type of regression analysis is particularly well suited to exploring the impact of policy variables—such as tax policy—on growth rates in the states. While there is evidence of convergence in growth rates in the states, other factors have clearly impacted these growth rates. Among these factors are policy variables unique to each state, including differences in tax policy.

Tax Policy and Economic Growth

Economic theory provides an explanation for a negative relationship between taxes and economic growth.[6] Taxes raise the cost —or lower the return—to the taxed activity. Individuals and firms have an incentive to engage in activities that minimize their tax burden. As they substitute activities that are taxed at a lower rate for activities taxed at a higher rate, this distorts resource allocation, leading to lower rates of economic growth. When taxes induce individuals and firms to engage in less productive activity, this will lower the rate of economic growth. In exogenous growth models the result is a temporary reduction in growth rates. But, in endogenous growth models the result is a reduction in the steady state growth rate.

In recent decades there is evidence supporting this negative relationship between taxes and economic growth in the states, consistent with our economic theory.[7] However,

there are several issues that must be addressed before this negative relationship can be confirmed.

The first issue is the evidence of convergence in growth rates in the states. Convergence implies a negative relationship between growth rates and the initial level of income per capita. Differences in growth rates may be due to the differences in initial levels of income per capita. A regression analysis of the relationship between taxes and economic growth would have to control for initial income to isolate convergence and tax effects on growth rates.

A second issue in testing the relationship between taxes and economic growth is the impact of other exogenous variables that affect growth rates. Among the most important of these exogenous variables are other fiscal policies. It matters a great deal how states obtain funds and how those funds are expended. Taxes are, of course, only one source of funds for the states. Further, how those funds are expended will have an impact on economic growth.

These are empirical questions, and there is now a vast literature examining the effects of taxation on state and local economic activity. In a survey of this literature, Bartick concluded that taxes have a significant negative effect on the location of economic activity in open economies.[8] More recent studies confirm his findings at both the state and local level.[9]

Model Specification

The empirical literature suggests that to isolate the effect of taxes on economic growth in the states a model must satisfy several conditions. To control for convergence effects one must incorporate a variable for the initial level of state personal income per capita.

In analyzing the impact of taxes on economic growth it is important to distinguish between average tax rates and marginal tax rates. Average tax rates measure the size of state and local revenues relative to personal income. Marginal tax rates measure the additional taxes paid when personal income rises by a small amount.

While average tax rates have often been used to make inferences about the effect of taxes on economic growth, they are not a good measure. This is because average tax rates do not induce behavioral changes in individuals. Average tax rates reflect changes in marginal tax rates, and the behavioral response of individuals to those changes.

Marginal tax rates are the best measure of the impact of taxes on economic growth. This is because marginal tax rates show how much taxes are paid on the last dollar earned from working and investing. In effect, marginal tax rates measure the cost of earning the additional income. Like any cost, the higher the marginal tax rate the less incentive individuals have to engage in productive activity to earn that last dollar. A higher marginal tax rate creates disincentives to work and invest. The result is greater distortion in productive activity, greater inefficiency, and lower economic growth. Economists refer to this as the deadweight loss due to higher tax rates.

Koester and Kormendi (1989) have suggested a method for estimating average marginal tax rates, using a linear approximation. If we assume a linear flat tax then tax revenues can be divided into two parts. One part is independent of behavioral changes, while the other part is dependent on those changes.

1) Revenue = a + MTR (Income)

Where:
The constant term "a" is that portion of revenue not dependent on income. The marginal tax rate MTR captures the effect on revenue of small changes in income.

Talking*Point*:

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The constant term in the above equation can be thought of as a lump sum tax. Because lump sum taxes do not influence behavior they are considered non-distorting. Such lump sum taxes are implicit in all tax schedules. If the lump sum tax is positive, the tax schedule is considered to be regressive. If the lump sum tax is negative, the tax schedule is progressive. If the lump sum tax is zero, the tax schedule is proportional.

There are a number of assumptions in using this equation to estimate average marginal tax rates in the states. The marginal tax rate is estimated over all taxed units in the state. The assumption is that this is the marginal tax rate for a representative taxpayer in the state. It is also assumed that the tax base is proportional to income.

Finally, the analysis must control for the impact of other fiscal policies on economic growth. When marginal tax rates change, governments may balance the budget in different ways that independently affect the rate of economic growth. Empirical studies have used a variety of techniques to control for the sources and uses of government revenues in estimating the effect of taxes on economic growth.

Many studies have attempted to control for expenditure by introducing expenditures as an explanatory variable. Some studies control for expenditure by introducing average tax rates as an explanatory variable. In many of these studies the coefficient on taxes is insignificant. However, these studies are not correctly specified because they do not adequately control for expenditures, and therefore do not isolate the effect of taxes.

Besci (1996) and Crain (2003) use a short cut technique to control for average tax revenues when marginal tax rates change. Besci points out that controlling for average tax rates means neutrality of average revenue, but this does not imply revenue neutrality. Only if marginal tax rate changes are regressivity neutral can one make that inference. Therefore, Besci introduces a measure of regressivity in the model.

2) RR = ATR/MTR

Where:
- RR is relative regressivity
- ATR is average tax revenue
- MTR is marginal tax rate

This measure of relative regressivity (RR) is introduced in the present study to adjust for revenue neutrality. This approach assumes that any change in the tax system is offset by other changes in taxes so as to leave total revenue and expenditures unchanged. The effect of revenue neutral marginal tax rates is estimated, assuming that the budget is balanced without expenditures, transfers, or non-tax revenue changes.

The regressivity measure is the equivalent of the ratio of two percentage changes—the percentage change in personal income divided by the percentage change in taxes. A relative regressivity measure greater than one means that the percentage change in income exceeds the percentage change in taxes, i.e., a regressive tax system. Conversely, a relative regressivity measure less than one means that the percentage change in income is less than the percentage change in taxes, i.e., a progressive tax system. When the relative regressivity measure is unity, the percentage change in income is equal to the percentage change in taxes, i.e., a proportional tax system.

Koester and Kormondi (1989) point out that this method of estimating the marginal tax rate is robust only if there are no structural changes in the tax schedule over the sample period. There were many structural changes in taxes enacted at the state and local level over this period. Among the most important of these changes were those accompanying

federal tax reform during the Reagan administration.

The Reagan tax reforms had both direct and indirect effects on tax reform in the states Gold (1991). Those reforms significantly reduced federal tax burdens in all the states. They reduced federal income tax rates, and simplified the number of tax brackets. They also closed loopholes, and broadened the base of the federal income tax. A more generous standard deduction and personal exemption were introduced. The impact of these reforms was to significantly reduce the importance of the federal income tax relative to taxes imposed by state and local jurisdictions.

The direct link between the Reagan tax reforms and tax reform in the states is found in states with income taxes tied to the federal income tax. Broadening the base of the federal income tax created a windfall of increased revenue for states using federal taxable income as the base for their state income tax.

States responded to the windfall from federal tax reform in different ways. Some states attempted to offset at least part of the windfall by enacting reforms in their own income taxes. They incorporated many of the changes that had been introduced in the federal income tax: broadening the tax base, lowering tax rates, and relieving taxes on low income households by raising the personal exemption and standard deduction.

The reduction in tax rates reduced the elasticity of state income taxes. At the same time, these reforms increased the progressivity of state income taxes. This was due to several factors: relieving taxes on low income families; and broadening the base to conform to federal changes that removed the exclusion for capital gains and eliminated many tax shelters.

There is clear evidence of convergence in state income tax rates in the years following federal tax reform in 1986. States with relatively high income tax rates tended to lower them; states with relatively low income tax rates tended to increase them.

However, some states responded to federal tax reform by capturing the windfall in increased state income taxes. These states retained, and in some cases increased, high income tax rates. Some states that did not rely on income taxes also increased a variety of other taxes and fees. The result in these states was a significant increase in tax burdens in the post Reagan years. These states tended to boost state spending to match the higher revenues.

Most states adopted an income tax, and came to rely on income tax revenues as the major source of revenue in this period. The different response of the states to the Reagan tax reforms is most likely reflected in their income tax. To capture this structural change a dummy variable for income taxes is introduced in the model. This variable (TAXDUM) has a value of 1 for states with an income tax, and zero for states without an income tax.

The model specified in this study is shown in equation 3.

3) RG = a + bRMTR + cRPCP + dRR + fTAXDUM + e

Where:

- RG is relative growth rate
- RMTR is relative marginal tax rate
- RPCP is relative per capita income
- RR is relative regressivity
- TAXDUM is a dummy variable for states with an income tax
- a is a constant term
- b, c, d, and f are coefficients on independent variables
- e is an error term

Talking*Point*:

The [study] results underscore the negative impact of income taxes on economic growth in the states. The states with an income tax appear to be at a considerable disadvantage compared to states without an income tax in achieving higher rates of economic growth.

Econometric Analysis

In this study, cross section regression analysis is used to estimate the effect of marginal tax rate changes on income growth. Dependent and independent variables in the regression analysis are expressed as log differences from their national averages. Variables are expressed for each state i over the time period.

4) RGi = a + bRMTRi + cRPCPi + dRRi + fTAXDUMi +e

The dependent variable is the rate of growth of nominal Gross Domestic Product in each state. This variable (RGi) is calculated as the difference between the average annual rate of growth in nominal Gross Domestic Product in each state, and the average for the nation as a whole.

The explanatory variables in the regression analysis include, in addition to a constant term, per capita personal income in the initial year, the marginal tax rate, tax regressivity, and a dummy variable for income taxes.

The marginal tax rate (MTR) is estimated for each state using equation (1), where total tax revenue is regressed on a constant and state personal income. The relative marginal tax rate (RMTRi) is calculated as the difference between the marginal tax rate estimated for each state and that estimated for the nation as a whole.

Per capita personal income in the initial year (RPCPi) is calculated as the difference in the per capita personal income in the initial year for each state, and that for the nation as a whole.

Regressivity is defined as the ratio of the average tax rate to the marginal tax rate (ATR/MTR). Relative regressivity (RRi) is calculated as the difference between the measure of regressivity in each state and that for the nation as a whole.

The existence of an income tax is expected to have a significant impact on economic growth in a state. This study attempts to isolate the impact of income taxes in two ways. A sub sample is created for the forty one states that impose an income tax. An alternative approach is to introduce a dummy variable for states with an income tax in the regression analysis for the full sample of fifty states. This dummy variable (TAXDUMi) has a value of 1 for states with an income tax, and zero for states without an income tax.

Empirical Results

The data for the variables analyzed in the study are census data for the period 1963 to 2004. Ordinary least squares regression analysis adjusted for White's correction is used in the regression analysis. The regression results are presented in Appendix 1. The following table summarizes these regression results.

Table 1. Regression Estimates, 1964-2004

	50 States	41 States	50 States Tax Variable
CONSTANT	-0.061577*	-0.059981*	-0.002499
RPCPI	-0.034443*	-0.029823*	-0.024883*
RMTR	-0.374131*	-0.394429*	-0.25103**
RR	0.004981*	0.004191*	0.004729*
Tax Dum			-0.048495*
	R2=.288	R2=.300	R2=.396

*Note: *Coefficients are significant at the 95% confidence level.*
***Coefficient significant at the 90% confidence level. See Appendix 1.*

Taxes and Economic Growth

Our focus is on the impact of tax policy on economic growth in the states. The analysis supports the hypothesis that taxes have a negative impact on economic growth. Further insight is provided regarding the nature of this negative relationship.

The first column shows the regression results for the sample for all 50 states, without a dummy variable for income taxes. The estimated coefficient on the relative marginal tax rate is -0.37. This means that the projected impact of a 1 percent marginal tax rate increase (relative to the median tax rate) reduces a state's growth rate by 3.7 percent.

The second column shows the regression results for the sub sample of 41 states with an income tax. The estimated coefficient on the relative marginal tax rate in this equation is -0.39. This means that an increase in the marginal tax rate for states with an income tax has a somewhat greater negative impact on growth compared to states without an income tax.

To further isolate the impact of the income tax, a dummy variable for the income tax (TAX DUM) is incorporated in the regression for all 50 states shown in the third column.

In the third column, the coefficient on the marginal tax rate is negative and significant, although at a lower confidence level than the coefficients on this variable in the other equations. The coefficient on the marginal tax rate in this equation also explains a smaller share of the rate of economic growth, compared to that in the other equations. This is not surprising because in this equation the coefficient on the income tax dummy variable is also negative and significant. Both of these negative effects of taxes on economic growth are captured in this equation. The results suggest that all taxes, and not just income taxes, had a significant negative impact on economic growth in the states. However, the results underscore the negative impact of income taxes on economic growth in the states. The states with an income tax appear to be at a considerable disadvantage compared to states without an income tax in achieving higher rates of economic growth.

The negative coefficient on the marginal tax rate is larger and accounts for a larger share of economic growth in this study compared to other studies. This high coefficient on the relative marginal tax rate may be accounted for by the longer period of time covered in this study, including more recent decades, compared to other studies.

This analysis supports the convergence hypothesis. In all of these equations the sign on the coefficient for initial relative per capita personal income (RPCPI) is negative and significant. This means that the higher the initial level of income per capita the lower the rate of economic growth. The period is sufficiently long to capture these convergence effects. The analysis underscores the importance of controlling for convergence effects in isolating the impact of taxes on economic growth.

The study controls for regressivity in the tax system in order to isolate the impact of revenue neutral changes in the marginal tax rate on economic growth. Relative regressivity (RR) measures the regressivity of the tax system in an individual state relative to that for the country as a whole. The coefficient on relative regressivity (RR) is positive and significant in each of the equations.

This analysis can also be used to estimate the impact of taxes on economic growth in an individual state. In regression results for Texas the estimated coefficient on the relative marginal tax rate is -0.26. This means that the projected impact of a 1 percent marginal tax rate increase reduces Texas' growth rate by 2.6 percent. A given increase in the marginal tax rate has a smaller negative impact on economic growth in Texas compared to other states for two reasons: Texas does not rely on an income tax; and Texas has experienced lower growth compared to other states.

Based on the regression estimates for all states, we can estimate that if Texas had substituted an income tax for alternative taxes to generate the same level of revenue over this period, this would have reduced the growth rate 0.47 percent. For example, if Texas had relied on an income tax rather than alternative taxes over the last eight years the average annual growth rate would have been reduced from 6.5 percent to 6.0 percent. This may not seem like a large difference; however such differential growth rates cumulate to significant differences in levels of income per capita over long periods of time.

CONCLUSIONS

This study explores the impact of tax policy on economic growth in the states, and estimates the impact of marginal tax rates on economic growth in the states by controlling for regressivity. The study reveals that regressivity neutral marginal tax rate increases reduced economic growth. The evidence reveals convergence in income per capita in the states. Controlling for convergence is essential in isolating the impact of taxes on economic growth in the states.

The study reveals that all taxes had a negative impact on economic growth in the states over this period. However, the analysis underscores the negative impact of income taxes on economic growth in the states. Most states introduced an income tax, and came to rely on the income tax as the primary source of revenue. Ceteris paribus, jurisdictions that imposed an income tax to generate a given level of revenue experienced lower rates of economic growth, compared to jurisdictions that relied on alternative taxes to generate the same revenue.

The Reagan tax reforms decreased the relative importance of federal tax burdens, and increased the relative importance of state and local tax burdens as determinants of economic growth in the states. States responded differently to the windfall in revenue created by the Reagan tax reforms. Some states reformed their state income taxes, analogous to the reforms enacted at the federal level. They reduced income tax rates, as well as the number of tax brackets. They also broadened the tax base by closing loopholes and eliminating tax shelters. Some states provided tax relief to low income households by increasing the personal exemption and standard deduction. Some states replaced their graduated income tax with a flat rate income tax.

However, some states retained or increased high income tax rates. These states now appear to be at a significant disadvantage compared to other states in terms of economic growth. It is not surprising that legislation has now been introduced in many of these states to reduce income tax rates; and some states have proposed eliminating the income tax altogether.

The study reveals that taxes had a negative impact on economic growth in all states, including those that don't impose an income tax. Some of these states also increased a variety of taxes and fees following the Reagan tax reforms. Higher tax burdens negatively impacted economic growth, whether they came from income taxes, or other taxes and fees. In recent years some of these states have also introduced legislation to reduce tax burdens in order to promote higher rates of economic growth.

The response of the states to the Reagan tax reforms resulted in changes in average and marginal tax rates in the states. For the states as a whole the marginal tax rate was greater than the average tax rate, indicating that the tax burden on citizens was increasing over the period. However, this reflected divergence in the tax policies pursued in the different states. In more profligate states the marginal and average tax rates exceeded that

for the nation as a whole. In these states their marginal tax rate tended to exceed their average tax rate by a wide margin. More prudent states maintained marginal and average tax rates below that for the nation.

This study confirms the evidence of a negative impact of taxes on economic growth in the states found in other studies utilizing an endogenous growth model. The negative coefficient on the relative marginal tax rate is larger, and accounts for a greater share of economic growth, in this study, compared to that found in other studies. The most likely explanation is that this study covers a longer time, including several decades after the Reagan tax reforms.

One could argue that even with this longer time frame, the data fails to capture the true long-term effects of taxes on economic growth. It is also possible that future structural changes could alter this negative relationship between taxes and economic growth. With these caveats in mind, we conclude that for almost half a century, taxes have had a negative impact on economic growth in the states.

ENDNOTES

[1] See 50 State Comparison of Business Tax Climates, Tax Foundation (2006).
[2] For an excellent review of this literature see (Bartik (1991); also see, Benson and Johnson (1986), Helms (1985), Bahl and Sjoquist (1990), Hines (1996).
[3] For a review of the theory of convergence across states see, Barro and Sala-i-Martin (1991), and (1992).
[4] See for example, Besci (1996).
[5] For a review of this literature on Barro regressions see Sala-i-Martin (1994).
[6] For a discussion of the effect of taxes on growth in endogenous growth models see Stokey and Rebelo (1995).
[7] See Bartik (1991).
[8] Ibid.
[9] For the effects of taxes on local economic activity see Inman (1989); and (1995). See also Goolsbee and Maydew (2000). For the effect of taxes on state economic activity see Besci (1996) and Crain (2003).

APPENDIX 1.: REGRESSION ESTIMATES FOR THE THREE MODELS

I. 50 States

Method of estimation = Ordinary Least Squares

Dependent variable: RG
Current sample: 1 to 50
Number of observations: 50

Mean of dep. var. = .967955E-02
Std. dev. of dep. var. = .053007
Sum of squared residuals = .098004
Variance of residuals = .213053E-02
Std. error of regression = .046158
R-squared = .288151
Adjusted R-squared = .241726

LM het. test = 1.00616 [.316]
Durbin-Watson = 1.45213 [<.063]
Jarque-Bera test = .873448 [.646]
Ramsey's RESET2 = .022759 [.881]
F (zero slopes) = 6.20681 [.001]
Schwarz B.I.C. = -77.0982
Log likelihood = 84.9222

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
CONSTANT	-.061577	.028629	-2.15090	[.037]
RPCPI	-.034443	.015363	-2.24198	[.030]
RMTR	-.374131	.138392	-2.70342	[.010]
RR	.498198E-02	.149024E-02	3.34307	[.002]

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

II. 41 States with Income Tax

Method of estimation = Ordinary Least Squares

Dependent variable: RG
Current sample: 1 to 41
Number of observations: 41

Mean of dep. var. = -.230500E-02
Std. dev. of dep. var. = .046312
Sum of squared residuals = .060002
Variance of residuals = .162169E-02
Std. error of regression = .040270
R-squared = .300603
Adjusted R-squared = .243895

LM het. test = 2.15661 [.142]
Durbin-Watson = 1.63628 [<.236]
Jarque-Bera test = .349661 [.840]
Ramsey's RESET2 = .041397 [.840]
F (zero slopes) = 5.30090 [.004]
Schwarz B.I.C. = -68.1987
Log likelihood = 75.6259

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
CONSTANT	-.059981	.025842	-2.32101	[.026]
RPCPI	-.029823	.013806	-2.16021	[.037]
RMTR	-.394429	.137330	-2.87214	[.007]
RR	.419149E-02	.129982E-02	3.22467	[.003]

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

III. 50 States with Tax Dummy = 1 if state income tax is present

Method of estimation = Ordinary Least Squares

Dependent variable: RG
Current sample: 1 to 50
Number of observations: 50

Mean of dep. var. = .967955E-02	LM het. test = .279916 [.597]
Std. dev. of dep. var. = .053007	Durbin-Watson = 1.42485 [<.071]
Sum of squared residuals = .083069	Jarque-Bera test = .148774 [.928]
Variance of residuals = .184597E-02	Ramsey's RESET2 = .647865 [.425]
Std. error of regression = .042965	F (zero slopes) = 7.39546 [.000]
R-squared = .396636	Schwarz B.I.C. = -79.2758
Adjusted R-squared = .343004	Log likelihood = 89.0558

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
CONSTANT	-.249919E-02	.028311	-.088276	[.930]
RPCPI	-.024883	.012831	-1.93932	[.059]
RMTR	-.251032	.148790	-1.68716	[.098]
RR	.472989E-02	.137719E-02	3.43446	[.001]
TAXDUM	-.048495	.019667	-2.46573	[.018]

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

APPENDIX 2. RELATIVE STATE PER CAPITA PERSONAL INCOME (PCPI) 1963 AND 2004 (PERCENT)

Region	States	PCPI 1963	Rank	PCPI 2004	Rank
Far West	AK	17.5	8	2.8	16
	CA	22.4	3	6.6	11
	HI	7.0	13	-1.3	19
	NV	25.2	2	2.2	17
	OR	0.3	16	-7.5	29
	WA	7.9	10	6.0	12
Great Lakes	IL	17.6	7	5.1	13
	IN	-1.9	20	-8.6	31
	MI	7.7	11	-2.9	22
	OH	2.7	14	-5.7	25
	WI	-3.0	22	-2.7	21
Mideast	DE	20.3	6	8.1	10
	MD	7.4	12	19.9	4
	NJ	20.9	5	25.9	3
	NY	21.1	4	15.8	5
	PA	-0.9	19	0.8	18
New England	CT	28.3	1	37.1	1
	MA	10.4	9	27.6	2
	ME	-19.1	39	-9.1	33
	NH	-4.2	25	10.8	6
	RI	0.7	15	3.5	15
	VT	-16.0	36	-3.8	23
Plains	IA	-4.0	23	-6.0	27
	KS	-5.9	26	-6.0	26
	MN	-2.9	21	9.5	7
	MO	-4.2	24	-7.8	30
	ND	-15.4	35	-10.7	36
	NE	-7.6	27	-2.2	20
	SD	-20.3	40	-8.6	32
Rocky Mountains	CO	0.2	17	9.3	9
	ID	-14.4	33	-18.7	45
	MT	-8.1	28	-16.3	41
	UT	-10.0	29	-19.5	46
	WY	0.1	18	3.7	14

Region	States	PCPI 1963	Rank	PCPI 2004	Rank
Southeast	AL	-30.6	47	-16.2	40
	AR	-34.7	49	-21.9	48
	FL	-13.2	32	-4.8	24
	GA	-22.6	41	-9.9	35
	KY	-24.8	43	-17.5	43
	LA	-24.7	42	-17.4	42
	MS	-40.9	50	-25.8	50
	NC	-25.9	44	-11.3	37
	SC	-34.1	48	-17.7	44
	TN	-26.8	45	-9.7	34
	VA	-12.5	30	9.4	8
	WV	-26.9	46	-22.0	49
Southwest	AZ	-13.0	31	-13.3	38
	NM	-18.9	38	-20.8	47
	OK	-18.9	37	-15.8	39
	TX	-15.0	34	-7.0	28

Source: U.S. Bureau of Census

Appendix 3. Average Annual Differential Growth Rates of PCPI 1964 - 2004 (Percent)

Region	States	RG1964-2004	Rank
Far West	AK	-0.23	44
	CA	-0.35	49
	HI	-0.19	40
	NV	-0.51	50
	OR	-0.21	41
	WA	-0.04	34
Great Lakes	IL	-0.29	48
	IN	-0.18	39
	MI	-0.26	45
	OH	-0.22	43
	WI	0.01	32
Mideast	DE	-0.28	46
	MD	0.28	16
	NJ	0.11	27
	NY	-0.12	38
	PA	0.04	29

Region	States	RG1964-2004	Rank
New England	CT	0.19	22
	MA	0.38	12
	ME	0.31	15
	NH	0.40	11
	RI	0.07	28
	VT	0.36	13
Plains	IA	-0.01	33
	KS	0.01	31
	MN	0.33	14
	MO	-0.10	36
	ND	0.47	8
	NE	0.18	23
	SD	0.46	9
Rocky Mountains	CO	0.24	21
	ID	-0.11	37
	MT	-0.22	42
	UT	-0.29	47
	WY	0.14	25
Southeast	AL	0.49	5
	AR	0.48	6
	FL	0.26	18
	GA	0.40	10
	KY	0.25	20
	LA	0.26	17
	MS	0.60	1
	NC	0.48	7
	SC	0.59	2
	TN	0.55	4
	VA	0.58	3
	WV	0.17	24
Southwest	AZ	0.01	30
	NM	-0.05	35
	OK	0.13	26
	TX	0.26	19

Source: U.S. Bureau of Census

Appendix 4. State Average Tax Rates (ATR) 1964-2004 (Percent)

Region	States	ATR1964-2004	Rank
Far West	AK	14.91	1
	CA	10.72	12
	HI	11.47	7
	NV	9.62	36
	OR	10.06	25
	WA	10.22	21
Great Lakes	IL	9.71	33
	IN	9.38	40
	MI	10.60	14
	OH	9.23	42
	WI	11.77	4
Mideast	DE	9.92	28
	MD	9.89	29
	NJ	10.07	24
	NY	13.59	2
	PA	9.82	30
New England	CT	9.96	27
	MA	10.84	10
	ME	11.34	8
	NH	8.34	50
	RI	10.50	15
	VT	11.64	5
Plains	IA	10.46	16
	KS	10.08	22
	MN	11.50	6
	MO	8.75	47
	ND	10.37	18
	NE	10.08	22
	SD	9.72	32
Rocky Mountains	CO	9.65	34
	ID	9.82	30
	MT	10.78	11
	UT	10.37	18
	WY	12.47	3

Region	States	ATR1964-2004	Rank
Southeast	AL	8.54	48
	AR	9.02	43
	FL	8.81	46
	GA	9.41	38
	KY	9.64	35
	LA	10.41	17
	MS	10.00	26
	NC	9.43	37
	SC	9.28	41
	TN	8.48	49
	VA	8.90	45
	WV	10.33	20
Southwest	AZ	10.64	13
	NM	11.00	9
	OK	9.41	38
	TX	8.98	44
United States		10.24	

Source: U.S. Bureau of Census

Appendix 5. Estimated State Marginal Tax Rates (MTR) 1964-2004 (Percent)

Region	States	MTR1964-2004	Rank
Far West	AK	12.47	3
	CA	10.58	19
	HI	12.23	4
	NV	9.61	40
	OR	9.55	41
	WA	10.26	27
Great Lakes	IL	10.13	30
	IN	10.21	28
	MI	10.44	21
	OH	11.09	12
	WI	11.74	6
Mideast	DE	10.40	23
	MD	10.04	32
	NJ	10.89	14
New England	NY	13.46	1
	PA	10.17	29

Region	States	MTR1964-2004	Rank
New England	CT	11.24	11
	MA	9.90	37
	ME	12.87	2
	NH	8.42	50
	RI	11.25	9
	VT	11.25	10
Plains	IA	10.36	25
	KS	10.57	20
	MN	11.39	8
	MO	9.49	43
	ND	10.69	16
	NE	10.88	15
	SD	8.63	47
Rocky Mountains	CO	8.99	46
	ID	10.40	24
	MT	9.86	38
	UT	10.63	18
	WY	11.86	5
Southeast	AL	8.58	48
	AR	10.07	31
	FL	9.50	42
	GA	9.98	35
	KY	10.68	17
	LA	10.44	22
	MS	10.28	26
	NC	9.99	34
	SC	9.71	39
	TN	8.44	49
	VA	9.37	44
	WV	10.97	13
Southwest	AZ	10.03	33
	NM	11.42	7
	OK	9.94	36
	TX	9.37	45
United States		10.46	

Source: U.S. Bureau of Census

Appendix 6. Relative Regressivity (RR) as Computed from Appendices 4 and 5

Region	States	RR1964 -2004	Rank
Far West	AK	1.1957	1
	CA	1.0132	11
	HI	0.9379	39
	NV	1.0010	17
	OR	1.0534	7
	WA	0.9961	19
Great Lakes	IL	0.9585	28
	IN	0.9187	45
	MI	1.0153	10
	OH	0.8323	50
	WI	1.0026	16
Mideast	DE	0.9538	31
	MD	0.9851	22
	NJ	0.9247	43
	NY	1.0097	12
	PA	0.9656	26
New England	CT	0.8861	48
	MA	1.0949	3
	ME	0.8811	49
	NH	0.9905	21
	RI	0.9333	40
	VT	1.0347	9
Plains	IA	1.0097	14
	KS	0.9536	32
	MN	1.0097	13
	MO	0.9220	44
	ND	0.9701	25
	NE	0.9265	42
	SD	1.1263	2
Rocky Mountains	CO	1.0734	5
	ID	0.9442	35
	MT	1.0933	4
	UT	0.9755	23
	WY	1.0514	8

Region	States	RR1964 -2004	Rank
Southeast	AL	0.9953	20
	AR	0.8957	47
	FL	0.9274	41
	GA	0.9429	37
	KY	0.9026	46
	LA	0.9971	18
	MS	0.9728	24
	NC	0.9439	36
	SC	0.9557	30
	TN	1.0047	15
	VA	0.9498	33
	WV	0.9417	38
Southwest	AZ	1.0608	6
	NM	0.9632	27
	OK	0.9467	34
	TX	0.9584	29

Source: U.S. Bureau of Census

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