The Effect of U.S. State Taxes on State Economic Prosperity

Casey Dainsberg
Bemidji State University

Contents

Abstract

Policy makers today are faced with trying to create solutions for economic troubles that become increasingly more complex and foreboding. Tax cuts and tax hikes are proposed and considered as possible solutions to various economic problems. However, the question still remains regarding which policies are most effective. The purpose of this research is to asses these competing claims. It seeks to find evidence that will shed light on one of these views. I have done this by accumulating tax and economic data from the fifty U.S. States between the years 2001-2009. Previous research has concluded that taxes do affect the economy dependent upon where the revenue is used. Rather than look at state expenditures resulting from tax revenue, this research looks instead at specific taxes and economic indicators to determine how tax policies affect economic growth. The anticipated result of this research is that there will be a positive relationship between lower taxes and higher economic prosperity.

Introduction

The current issue before us is of great importance to our country. In a time of economic unrest, we find ourselves scratching and clawing for solutions to lift us out of the quagmire of unsustainable debt, and financial insecurity. In the United States, state governments are responsible for keeping their budgets balanced, and acting upon what they deem to be the course most likely to result in prosperity and economic stability. State legislators do this by making adjustments to tax rates, and state spending. This, in return affects the economic structure of that state—in essence, their prosperity, economic stability and output.

Many researchers have explored the effect of taxes on economic growth. However, the results are indeterminate. This might be inevitable. Tax and economic policy is complicated, and many factors can attribute to it. Nevertheless, it is a topic that is becoming increasingly relevant and begs us to dig deeper for a solution. One economic theory proposes that when taxes are low, individuals and businesses are able to keep more of the money they earn. This revenue can then be spent on other things whether it be in material/recreational goods, or in job creation and expanding business. In theory then, this would in turn stimulate the economy and ultimately encouraging growth. On the flip side, other theories would attest that when taxes are higher, the influx of tax revenues will then be spent on infrastructure, education, and healthcare, etc…the result of which would create jobs, and stimulate the economy.

In this research I will explore the idea of how taxes effect economic growth. Most specifically, adopting concepts from the first theory mentioned above I will explore the effect of specific taxes on state economic health. The hypothesis I propose is that states with lower taxes will have higher economic prosperity than states with higher taxes. Previous research has focused on a variety of variables to create theories relating to taxes and economic growth.

Many implement a spending, or expenditure variable that account for how taxes are used and the economic growth thus precipitated. It is not in this direction that I steer my research. Instead, I want to look at specific sources of tax revenue, and test those values using economic performance indicators.

Measuring the causal part of this relationship will be the sales, individual income, corporate income, and property tax revenues from each state. The economic prosperity of each state will be measured by dependent variables such as unemployment rates, poverty rates, state debt and state GDP. In the following pages I build support for the variables proposed to test this hypothesis as well as touching on the broader picture—do taxes have an effect on state economies, and if so, is this relationship positive or negative? Furthermore, I then will explain the methodology and theory behind my research, concluding then with an analysis of the results.

Previous Research

Tax Policies and their Effects

Previous literature regarding the hypothesis which I mean to test—that is, the effect of taxes on economic growth—is mixed. I will first focus on previous research discussing the effect of taxes on the economy. Following that I will present literature supporting the use of economic indicators to measure the health of the economy concluding then with literature on possible controls.

Researchers have studied the effects of taxes several different ways. Becsi (1996) studied per capita personal income, as well as average tax rates (which is the ratio of total state and local tax receipts to state personal income) and marginal tax rates which, the authors affirm are the better theoretical measurement of influences of behavior and growth over a thirty-two year period. He determined that higher marginal tax rates have a statistically significant, negative effect on state growth. He proposes the importance of controlling for progressivity. This supports the hypothesized outcome of the research at hand. The use of regressions and controls were important in his research and can be adapted to the theory and practice of this research as well.

There are a variety of taxes that influence different sectors of the economy. For example, the income tax will affect a different economic sector than the sales tax. Isolating specific taxes implemented by the states and measuring their effectiveness allows me to analyze the effects of specific taxes on the economy.

New tax cuts and increased expenditures in the 1990's left several states with imbalanced budgets during the 2001 downturn. Because of this imbalance, tax increases were implemented. (Kelly, 2003) Kelly wrote that states who had a diverse tax structure did better

when hit with recession. These states relied on tax revenue from a variety of taxes and healthy reserves. States who relied primarily on sales tax revenue faired more poorly. Furthermore, the article looked closely at property taxes and found evidence of fiscal centralization of property taxes during the period 1992-2002, and reviewed the case for local fiscal autonomy. The effects of property taxes and other fiscal policy areas we found to have an impact on the economy.

Research of consumer taxes and income tax also yielded interesting results. A study by Milesi-Ferretti and Roubin (1998) studied the effect of these taxes on the economy. Looking at varying economic factors, they specifically looked at the effect of these taxes on resource allocation, economic growth, and welfare. What they found was that consumption taxes affect the choice between productive activities such as labor and education, and leisure time, in favor of the latter. This in turn reduces economic growth. They found the choice was similarly affected by income taxes however, in the case of income taxes other, distortions also contributed to negative economic growth. They also made it clear in their research that the effect of taxes on economic growth is dependent upon how they affect the labor supply-or unemployment.

As we can see, there are differences in how individual taxes influence the economy. Continuing then to observe these affects, additional research studied the effect of corporate taxes on economic growth. (Lee, Gordon 2005) By looking at the effect of corporate taxes on an economy, this research confirmed that there is a significant relationship behind higher corporate taxes and stifled economic growth. The analysis in this research goes on to also talk about personal taxes. It reports evidence that lower corporate taxes will result in lower

personal taxes, the result of which encourages more entrepreneurial activity. Higher entrepreneurial activity, we will read later, yields higher economic prosperity and health.

While some studies narrowed their research, others remained relatively broad. One such study examined the relationship between growth rates and taxes in the U.S. and Asian countries (Kim, 1998). Kim found that the difference in tax systems across countries explained a significant proportion of the difference in growth rates. He also found that differences in labor income tax, debt-equity ratio and inflation can be important in explaining the growth difference. As this research looks at the effects of taxes on the economy, Kim's research confirms there is a relationship between these variables, and taxes can and do help explain differences in growth.

From this work, one would draw the conclusion that taxes have a direct effect on economic growth. However, others would argue that taxes have only an indirect effect on the economy. In research conducted by L. Helms (1985), Helms theorized that the effects of state and local taxes on the economy are dependent upon how they are spent. Helms used a cross-section analysis using forty-eight states, over a period of fourteen years. From this research, Helms was able to understand the correlations between taxes and economic growth. His research found that tax revenues, dependent upon what they are used for, will cause the economy to grow or decline. His research then indicates a specific cause and effect of taxes in an economy directly related to how they are spent. While state expenditures do not fall into the parameters of this research, they will be considered when interpreting the results.

Following Helms, still further research suggests that taxes influence economic growth because of how they fund state expenditures. (Mofidi, Stone, 1990) Research concluded that the taxes, dependent upon where they are allotted by way of expenditures, has either a

positive or negative effect on economic growth. The theory and research of these latter two articles is strong. I have chosen to differentiate my research, however, by not including expenditure variables in hopes of isolating the effect of taxation on economic indicators. Nevertheless there are still elements of these studies from which we can extract applicable theory. The authors used several controls to test their hypothesis, some of which identified spurious and inverse relationships. They tested variables such as employment, taxes, and states residual surplus (or deficit). While I do not plan to test these variables in the same way the respective authors chose to do so, it may be said that they still represent a foundation of commonality from which to build this research. Also noteworthy is the general impact of taxes on the state economy.

Economic Indicators of Growth

In my research the use of economic indicator variables will be crucial to measuring the effect of taxes on the economy. State GDP (Gross Domestic Product) is one such variables generally used to measure state economic performance. One study suggests that for a state's economy to thrive its federal, state and local taxes combined should not exceed that of 23% their GDP. (Scully, 2006) He suggests that if taxes had remained at 23% of GDP over the fifty-four year period studied, GDP would have grown by 5.8% each year instead of the 3.5% it actually increased by. By this research we come to understand that higher taxes have an effect on GDP and the higher percentage of GDP accounted for by taxes will result in slower growth and lower GDP overall.

A second dependant variable is employment; or the lack-there-of. The level of employment is indicative of the health of the economy. Employment levels, if higher will result in a growing, healthy economy where as when there is decline and a higher rate of

unemployment, an economy will experience less growth and likely even declines. Results have indicated that things such as utility prices, personal income tax rates, and an overall increase in taxation results in the discouragement of employment growth in several industries. (Wasylenko, McGuire 1985) It is then possible to surmise by this research that taxes have a negative effect on state economic growth. Thus, I will expect to find a positive relationship between these variables—as unemployment rises, so will state taxes.

How quickly a state accumulates debt is another good indication of a state's economic well-being. Measuring a state's economic prosperity by looking at the amount of state debt as well as what caused it, is important in identifying effective policies, and defective policies. (Clingermayer, Wood, 1995) Findings from this research suggest that tax and expenditure limitations may actually increase growth in state indebtedness. Also, this research found that states with a liberal base tended to have higher debt than states with a conservative base. Like the article above, this research illuminates the factor of state indebtedness, and the economic policies that contribute to it. As we seek to define a states prosperity and success, understanding a state's financial standing is crucial to understanding whether or not their economic policies are in fact being effective and generating growth, or the opposite, suppressing it.

Another dependent variable I will test in my research is that of poverty. When a state has high poverty levels it suggests a stifled economy. In a study of various countries, researchers found that countries who experienced more economic growth and prosperity achieved greater reductions in poverty. (Roemer, Gugerty, 1997) They looked at GDP growth, and found that countries whose GDP rose significantly also saw significant declines in poverty. This study then implies that there will be positive relationship between lower poverty rates and

economic growth. In the scope of my own research I would then expect to find that states with higher taxes will have greater poverty that those with lower taxes.

Other Findings (Controls)

As we study the effects of state taxes on the economic growth of states, it is important to implement some controls to identify causal relationships between variables. Research indicates that higher education among a countries citizenry are important when accounting for the economic well-being of a nation state. (Hanushek, WoBmann 2007) This research studies various developed, and developing countries. However, the finding of their research can be made applicable to the fifty U.S. States. Hanushek and WoBmann concluded that education was found to have a notable effect on economic performance. By using education (and for our purposes looking at the number of high school and college graduates) I can control for this relationship and determine if it presents a significant causal relationship between variables.

States legislators also have an effect on the economic policies of the state. (Gilligan, Matsusaka, 2001) This study found that the more seats a state has in the upper chamber of a state legislature, the more taxes and spending that state issues. Most interesting in this particular study however, is the influence of political parties and the size of the state legislatures. Your political affiliation—Democrat or Republican—will indeed influence how you tax and spend. Because of the influence party affiliation can have on tax and economic policy, it is worth exploring whether or not the relationship between taxes and economic indicators change after introducing a control variable for party affiliation.

Another control I will use is the percentage of union members in a state. While research on unions and economic prosperity is diverse, one study set out to clarify previous research

on the subject (Doucouliagos, Laroche, 2003). The authors controlled for the differences in previous research, studying the effect of unions both in the United Kingdom and the United States. They found negative correlations between unions and economic prosperity in the United Kingdom, and a positive correlation between unions and prosperity in the United States. It is really just the effect of unions in the United States that we are concerned with in my research. I will test whether or not higher union memberships (indicating a strong union presence) will have an effect on taxes and economic growth in the form of a control.

The reviewed literature concerning the independent variables supports the proposition that taxes have an effect on the economy. Furthermore the research suggests that taxes impose a negative consequence on the economy, suppressing its growth. What the literature also suggests is that these dependent variables are in fact good indicators of economic health. Knowing this, we can advance in our research knowing the dependent variables are appropriate indicators of a state economic well-being. As a result of this research, I would like to suggest that states which implement economic policies that encourage reductions in taxes will be more successful and altogether more prosperous with less state debt, higher rates of industry, and more economic health than states that increase taxes. The research we have covered thus far serves as a platform for that topic which I have just disclosed, off of which we can delve into further analysis and testing.

Methods and Data

Defining Independent and Dependent Variables

Independent Variables

The units of analysis in my research are the fifty U.S. States. I study tax and economic data from each state for the years 2001, and 2009. The fifty U.S. States provide a cohesive body from which to extract data and draw comparisons. Because the tax and economic data varies from state to state it provides me with a way to compare and contrast policies. While the states share many commonalities, they also share many differences. The most notable of these are the tax and economic structures. Some states will chose to have an income tax, while other will not. While not common, it is nevertheless an interesting difference that makes a comparison of these entities all the more intriguing. Hence, by observing the fifty states I hope to gain a good understanding of how different tax policies affect the economy.

I collected tax revenue data from the U.S. Census Bureau. The units were expressed in thousands of dollars. Isolating the tax revenue for four specific taxes, I created the independent variables of this study. I extracted revenue data for sales tax, individual income tax, corporate income tax, and the property tax for each state for the years 2001 and 2009. I then computed the variables by subtracting the 2001 revenue for each tax from the 2009 revenue. The difference we obtained represents the growth or decline in the taxes between the years 2009 and 2001. These differences were then divided by the estimated population (U.S. Census Bureau) of each state for these respective years to see how the difference in each state on a per capita basis. The resulting variables then represent the change in the amount of each tax that was collected over eight years, per capita.

Dependent Variables

In this study it is also important to have variables that measure economic growth. These dependent variables were derived from a variety of different sources. To measure the strength of the economy, I gathered data for each state over the years of 2001 and 2009, for the following variables. First, I will use the unemployment rate expressed as a percentage from the Bureau of Labor Statistics. Then, I will use poverty rate data (also expressed as a percentage) from the U.S. Census Bureau. Further, I use the Gross Domestic Product in current dollars (in millions) from the Bureau of Economic Statistics. Similar to the independent variables, I computed the change in the dependent variables by finding the difference between 2009 figures and 2001. Excluding the poverty and unemployment variables, I then computed the change over time and divided the difference by the estimated population variable. The variables that result thus reflect the change between 2009 and 2001, per capita.

The theory behind these methods can use further explanation. I chose to compute the variables over time by subtracting the 2009 values from the 2001. One goal of this research is to observe the difference of taxes and economic growth over time. By finding the difference in this way we are measuring the change in taxes over time and seeing if they increase or decrease over an eight year period. Also, measuring the variables per capita controls for the effect of population size. For example, California will have much higher revenue numbers compared to North Dakota because it has a significantly larger populace, thus a larger economy etc…

Control Variables

To test these variables it was also important to use controls. I used data from Pollock's states data set from 2004. The data was not from either of the two years in our research, but

because it is actually in the middle of the time period being analyzed it will work well as a measure. I test relationships between the independent and dependent variables against the following four variables from Pollock's data set. First I tested the percentage of state legislators who are Democrats, the theory being that a higher number of Democratic legislators would account for higher taxes. Secondly, I looked at the percentage of the population with a college degree of higher to see if education would have any effect on taxes and economic growth. The third variable looked at the percentage of African Americans in a state so as to control for demographic differences. Lastly, I controlled for union membership to observe whether or not higher or lower union membership would have an effect on economic growth and prosperity.

Interpretation of the Findings

I tested my hypothesis by running various linear regressions to measure the relationship between the four taxes and economic indicators. This allowed me to identify the direct measurement and effect on the dependent variables when an independent variable is introduced. If my hypothesis is correct I will hope to find positive correlations between higher taxes and higher poverty and unemployment levels as well as lower GDP. I will study the effect of each tax on the economy individually.

I began by testing the effect of the change in state sales tax on unemployment, poverty, and state GDP. The first of these relationships we will look at is the relationship between the change in the unemployment rate between the years 2001 and 2009, and the change in sales tax over that same period.

(Table 1.1 about here)

What I found was that the change in the employment rate was negatively related to the change in sales tax per capita. This is further explained by the negative standardized coefficient and t-static. (See Table 1.1) This negative relationship then indicates that as the sales tax increases, the unemployment level decreases. I then tested the validity of this relationship by implementing control variables. These control variables affected the relationship between unemployment and higher sales tax, but not to a significant degree. By looking at Table 1.1, the coefficients and t-statistics are not significant, and don't show a strong enough relationship with the dependent variable to discount the previous findings.

Upon testing the effects of sales tax on poverty I found a similar relationship. Once again the coefficient and t-static tells us there is a negative relationship between the two variables. This negative relationship is even stronger than the relationship noted above between unemployment and sales tax and is statistically significant at the .05 level. This is also obvious by the higher R-square/adjusted R-square located at the bottom of Table 1.1. What we then observe is that as sales taxes increase, the poverty rate decreases. The further implementation of controls did not display any significant relationships that would interact with our findings. The combined R-square statistic for the controls did not significantly exceed that of the sales tax and poverty, and none of the controls were significant.

The third test yielded somewhat different results. The effect of the change in sales tax per capita on the change in GDP is positive. The positive coefficient (see Table 1.1) and t-static show the strength of the relationship and its significance. (Significant at the .05 level) As the change in GDP rises, so does the change in sales tax. The R-squared statistics are also fairly strong as they tell us that between 32-33 percent of the change in poverty is explained by the change in sales tax. Like the other variables, the addition of controls didn't significantly alter

this finding. The R-square statistics increased indicating that the control variables did influence the dependent variables. Even with this result however, non of the control variables reached a statistically significant level. Thus, the relationship between sales tax and dependents variables remains significant, and the additional controls don't change the results.

The results then of these three tests go against the hypothesized relationship and support in fact, the contradictory theory. Nevertheless, there are possible explanations for these results. Because sales tax is based off of commerce, it only makes sense that the more commerce a state has (like the measurement of state GDP for example,) the more tax revenue it will generate. The findings then don't exactly explain the causality of these relationships, and other variables might be required to test this relationship further.

The second tax variable that I studied was the change in individual income tax per capita.

(Table 1.2 about here)

Once again, starting with the relationship between the change in individual income tax and unemployment I found both the coefficient and t-statistic were negative, thus indicating of course, a negative relationship. (See Table 1.2) It is also worth noting that this relationship is significant at the .05 level. As was the case with the sales tax, I found that as the unemployment rate decreased, the individual income tax increased. The addition of the four control variables suggested some interaction. The addition of the controls raised the r-square statistics. Also, two of the controls, (the percentage of black persons in a state, and the percent of the population belonging to a union) were significant at the .05 level. While these variables further explained some of the variation in the dependent variable, they did not significantly detract from the relationship between income tax and unemployment. That relationship remained significant at the .05 level. So while some of the control variables did

interact with the dependent variable, they did not do so to such an extent as to detract from the original relationship.

The relationship between poverty and the individual income tax is negative. (See Table 1.2) Once again the coefficient and t-statistic suggest that as the poverty rate declines, the change in individual income taxes increases. The relationship is significant at the .1 level. After implementation of the controls, neither of the R-squared, coefficient statistics, or t-statistics are significant. Thus the initial interpretation of the findings remains and is not changed by the control variables.

Once again, the dependent variable of state GDP displayed positive results. A high positive coefficient and t-statistic reveal the strength and significance of this relationship at the .05 level (Refer to Table 1.2). What it tells us is that as the GDP rises, so does the individual income tax. Interesting to note is the high R-Square values, ranging from 38-40 percent; a stronger relationship than what we observed with the effect of the sales tax on GDP. The control variables did not then have any significant influence on this relationship or the dependent variable. They did account for some effect on the dependent variables however because the r-square statistics rose from 41 to 48 percent respectively. Still, this relationship is virtually insignificant as it doesn't change the results of the original regression analysis.

These findings continue to contradict the original hypothesis. The individual income tax did not have a positive effect on either unemployment or poverty, and it ceased to have a negative effect on the change in state GDP as I would expect if my theory were supported. Nevertheless, this may further unveil some causality issues. Because the individual income tax is based off of income and jobs, it would make sense that there would be higher income tax revenue when there are lower unemployment levels. Further, there would be higher

income taxes in a state where there is less poverty because that would mean more people are employed and making money. This does not exactly prove then that higher income taxes encourage economic growth as the findings would suggest.

Further study of specific taxes on economic growth requires us to observe the effect of the change in the corporate income tax on the dependent variables.

(Table 1.3 about here)

Upon testing the relationship between the change in corporate income taxes and unemployment the linear regression shows both a negative coefficient and t-statistic. While negative, the relationship is still significant at the .05 level. These values then conclude that for every increase in the change in corporate income tax, there is a -.473 decrease (see Table 1.3) in unemployment. Hence, as corporate income tax revenue rises, unemployment decreases. Testing this relationship against the control yielded results in line with this conclusion. Two controls, the percentage of the population who are black, and the percentage of the population with union membership were significant, and accounted for some change in the R-Squared values. Nevertheless, it did not alter the original findings.

The change in corporate incomes taxes effect on the second dependent variable, poverty, was not as strong as its previous relationship. The R-Square/Adjusted R-Square are relatively small, and the t-statistic falls bellow significance levels. However, the relationship is still negative (See Table 1.3), telling us that as the change in poverty rate decreases, the change in corporate income taxes increase. The additional control variables did not have any significant affects on the dependent variable or the independent variable, confirming that any interaction occurring is minor, and doesn't obstruct the original relationship.

The third variable by which I test the impact of the corporate income tax on the economy is the state GDP. The positive coefficient and significant t-statistic explain the direction and significance of this relationship. It is significant at the .05 level. The R-Squared statistics are all high (See Table 1.3), thus indicating the strength of the relationship. The change in GDP is explained 42 percent of the time by the independent variable, corporate income tax. By incorporating the control variables the R-Squared values rose even higher, the independent and control variables accounting for nearly half the effect on the change in GDP. Nevertheless, the control variables were insignificant, and didn't vary the initial finding. Interesting to note is that the corporate income tax has the strongest effect on state GDP than the previous two variables.

These regressions then show a relationship counter to that of my hypothesis. The affect of corporate taxes on all three dependent variables suggest that the higher tax revenues are beneficial to the economy. Here again we may have another issue of causality. The corporate income tax derives its revenue from corporate profit and capital. Because it is related to both business and commerce, I would suggest that the significant relationships between unemployment and state GDP are reflections of this. If a state has more corporate income revenue, that would imply that there is more business in that state, hence more employment and higher GDP.

The last tax I studied was the property tax. The effect of the property tax on unemployment is actually the weakest relationship between all three variables.

(Table 1.4 about here)

This may be due to the fact that property tax isn't revenue directly derived from labor or commerce, but based off of a material possession. The relationship however is still negative.

(See Table 1.4) While the relationship isn't strong, the direction of it indicates that as the unemployment rate decreases, the change in property taxes increase. The control variables had virtually no effect on this relationship as well, and none of them were significant.

The relationship between the poverty rate and the change in property taxes was higher, but still not statistically significant. Nevertheless, the coefficient and t-statistic continue to be negative. While not strong, it indicates that as the poverty rate decreases the change in property tax increases. Furthermore, the controls did not reveal any interaction among the variables.

The concluding regression then must test the change in property tax against that of states GDP. The other three taxes showed a very positive, strong relationship with this variable. Interestingly enough that is not the case of this variable. Unlike previous taxes, the relationship between the change in property tax and the state GDP is not statistically significant. (See Table 1.4) The relationship is positive, which still indicates a directionality suggesting that as GDP goes higher, so do property taxes, but not at the same rate and significance as we observed with the other variables. The control variables were also insignificant, and didn't influence the output of the regression in any significant way.

The property tax had the least significant effect on the economy as compared to the three previous taxes. As I mentioned above, this may be due to the fact that property tax is based on a material possession, and not on productivity and commerce like the other taxes. The relationship that the regressions showed was still that which would contradict the central theory of this research. Like the other variables we have analyzed this far, however, the findings might suggest that it is not the tax specifically causing the unemployment and poverty to decrease, and GDP to increase. It could simply be the fact that these taxes are

applied to various money-making industries—hence, when more revenue is generated it indicates a more healthy economy.

Continued Testing with Tax Rates

In addition to testing my hypothesis with tax revenues, I chose to test the hypothesis further with tax rates to see if it would reveal similar or differing results as compared to the tax revenue variables above. Because the findings were so contrary to the proposed hypothesis, doing this will continue to test and add further explanation to the research findings. Furthermore, the testing of tax revenue data and the dependent variables revealed issues of causality. By testing these relationships with tax rates instead of tax revenue will theoretically eliminate the reflective causality issues revealed above.[1]

Creating Variables

I collected Tax rate data for each state from the Tax Foundation Web site. For the purpose of these tests I chose just to collect tax rate data for the year 2009. First I collected the state and local combined tax rate average for each state in the year 2009. This made the sales tax rate variable. Because some state tax systems are progressive, I calculated the income tax variable by subtracting the single-person deduction and exemption value from that State's 2009 median household income (per capita). The tax rate bracket in which the commuted figure fell was then what I used for the states individual income tax rate. For the Corporate Income tax rate I used the state's 2009 median household income value once more and chose the applicable tax rate based on that figure. The property tax rate was expressed as the percentage of the median household income for 2009 that was accounted for by property taxes.

---

[1] A more detailed explanation of the causality issues revealed in the initial findings can be found in the Conclusion of this paper.

The three dependent variables were then used to test the relationship between tax rates and economic growth. I used the 2009 unemployment rate from the Bureau of Labor Statistics. The GDP variable, also for the year 2009 was from the Bureau of Economic Statistics, and the poverty rate variable from the U.S. Census Bureau for the year 2007. (2009 values were not yet available at the time of this study.) This additional testing did not account for the change in variables over a period of time, like the previous tests. Instead, it strictly compared 2009 values against one another.

Interpretation of Findings when Testing with Tax Rates

To analyze the relationship between tax rates and the three dependent variables I used Bivariate Correlation. This method was used to gauge the direction and strength of the relationship between the independent variables affect on the three dependent variables.

(Table 1.5 about here)

The first tax on Table 1.6 is the combined sales tax of each state. It is first tested against the unemployment rate. The Pearson's R coefficient is positive which indicates that while the sales tax rate rises, the unemployment rate is also rising. This relationship is also supported statistically, and is significant at the .1 level. The correlation between the combined state and local sales tax and poverty was also positive, and showed a strong correlation between the two variables. The results were also statistically significant at the .01 level. This strong relationship is in support of the hypothesis, and opposite the previous findings. What it suggests is that as sales taxes rise, the poverty rate is also rising. Worth noting is that both of these results are counter to those found in the previous test in which both dependent variables were negatively correlated when associated with the independent variable.

The third dependent variable is the change in State GDP. This relationship was very strong and also statistically significant at the .01 level. When initially testing the poverty rate with sales tax *revenue*, it showed a strong, positive relationship with both variables increasing at a steady rate. Once sales tax *rates* were implemented this relationship didn't change. The positive relationship suggested that as sale tax rates go up, the GDP also rose. The result then of sales tax rates on economic indicators is mixed. While the first two results were counter to that of the previous testing, this last correlation is not significantly dissimilar to the initial findings.

The second independent variable is the income tax rate. The correlation of this variable with the unemployment rate coefficient revealed a positive relationship. The close proximity of the Pearson's R coefficient to zero does not help explain causality or any real relationship between the two variables. This positive relationship would indicate that as income taxes rise, the unemployment rate also rises. Nevertheless, the relationship is so weak that while implications can be made of this relationship, there is no statistical evidence upon which to base further assumption. The income tax rate variable was then tested with the poverty rate variable. This relationship was in a negative direction, similar to the first test that used tax revenue. The negative relationship would timidly suggest that as income taxes rise, the poverty rate decreases. However, the relationship is still weak, and not statistically significant. As with the unemployment variable before it, the direction of this relationship is so weakly correlated its explanatory power is greatly reduced and must be rejected.

Lastly the income tax rate variable was correlated with the third dependent variable, State GDP. The resulting Pearson's R coefficient revealed another weak, slightly positive association. Because of this weak relationship, the results are not statistically significant, nor do they represent causality. Interesting to note however is the change between the income tax *revenue*

variables and the income tax *rate* variable. The tax *revenue* variable had a strong statistically positive relationship between with the state GDP variable. However, when the tax *rate* variable is used the strong statistical relationship disappears. The change that took place—going from a statistically significant, positive relationship to a weak, only slightly positive relationship is interesting and would strongly indicate that the tax revenue variables did have causality issues and requires further explanation.

Corporate Income Tax Rates is the third independent variable. The first relationship this study tested was between the corporate income tax rates and the unemployment rate. The result was a slightly negative relationship like the relationship observed in proceeding variables. It indicates a direction, but does not reveal evidence to make a causal explanation. In a comparison of the relationship between corporate tax *revenues* and corporate tax *rates*, there is an interesting change, however. The corporate tax revenues had a strong, statistically significant, negative relationship with unemployment. Upon testing this relationship with tax rates, however, the relationship weakened a great deal. While still negative, it is no longer statistically significant, nor is it explanatory.

The relationship between corporate income tax rates and poverty was interesting in that it didn't change too dramatically from what the tax *revenue* variable had initially indicated. Like in the first test, there is a negative relationship suggesting that as poverty decreases, the corporate tax rates increase. Not only is this relationship strong directionally, but it is also statistically significant at the .01 level. Then relationship then did not change too much in comparison to the previous findings.

Lastly the corporate income tax rate had a positive correlation with GDP. While this relationship was positive, the variable is very weakly correlated, and statistically insignificant.

The Pearson's R is higher then zero at .109. This coefficient is not strong enough to explain causality. Nevertheless it reveals an interesting shift from the results of the first test. The first test revealed a strong, statistically significant relationship among variables. Testing with the corporate tax *rates* showed a very weak, insignificant relationship.

Initially, testing of the property tax *revenue* variables revealed results that were fairly vague. There wasn't statistical evidence to support any of the findings, although directionally the results, were similar to those of other variables. Upon implementing the second variable for testing, property tax rate and unemployment, the results showed a positive relationship that was not statistically significant. This positive direction would suggest that as property taxes increase, the unemployment rate increases. Still, analysis of the Pearson's R coefficient reveals only a slight deviation from zero, and allows an inference of directionality but not concrete statistical strength to back it up. Further testing of the property tax rate variable against poverty revealed a negative, statistically significant relationship. The Pearson's R value was very high, and indicates a negative direction. Thus suggesting that as property taxes rise, poverty decreases. While this relationship would not support the hypothesis, it is interesting because in the first test, the relationship between property tax *revenues* and economic indicators were not at all statistically significant.

The results differ when the property tax rate is correlated with the state GDP. It is not negative, but instead indicates a positive relationship between property tax rates and GDP. The relationship is in fact strong and is significant at the .05 level. Like the proceeding results, this relationship is interesting because when previously testing this relationship with the revenue data, property taxes did not have a statistically significant relationship with any of the dependent variables.

Looking at tax *rates* instead of tax *revenues* revealed some interesting results that differed from the relationships observed within the first set of data. In the case of sales tax rates, the findings completely almost reversed the results of the first test with the exception of the GDP variable, in support of the hypothesis. The income tax *rate* variable was *not* significantly associated with any of the dependent variables, whereas the income tax *revenue* variable *was* significantly associated with all three variables. Still other interesting relationships emerged. For some of these variables the relationship between independent and dependent variables became non-existent, having been so weakened that they no longer reflected statistical significance or relationships.

Conclusion

The purpose of this research was to explore the relationship between taxes and economic growth. The central theory was that higher taxes would result in lower economic growth and prosperity. It is quite obvious that the results of this study are mostly mixed. Primary results seemed to initially reject the proposed hypothesis, and in fact supported the opposing theory. Further testing however revealed however that the initial findings had gaps and sought to further explain the causal relationship between taxes and economic indicators.

The primary results of the initial tests indicated that higher taxes were correlated with higher economic growth. Furthermore, the research showed which taxes have the greatest effect on the economy, and those are the sales tax, the individual income tax and the corporate income tax.

(*Table 1.6 about here*)

Specifically, the individual income tax had a statistically significant relationship with all three dependent variables. The tax that had the least amount of impact on the economy was the property tax.

Studying the effects of specific taxes on state economies have revealed some interesting results, and has no doubt uncovered areas for further exploration. It is important to note that while the findings were contrary to the central theory on which this study is based, it created more questions than it alleviated. The initial findings of the first set of data used revealed gaps in the causality of the research. This suggested that future research on the subject needed to be done to look specifically at other variables such as tax rates. Addition research was necessary to alleviate these causality gaps, and to provide further explain the causality of the findings. This is due to the direct relationship between the four tax revenue variables and labor and commerce. It makes sense that a state with higher sales tax will have higher GDP, because the higher sales tax is a reflection of the revenue resulting from the increased productivity. In this example the sales tax reflects the good economy, but there is nothing to suggest that it is what actually caused the economy to growth. This is the causality gap of which I speak, and it required further study. To further explore and measure these relationships differently, I tested tax *rates* instead of *revenues*. This was done in the hope that their inclusion would eliminate the mirroring effect the initial testing of tax revenues seemed to have on economic growth.

As a result of testing these additional tax rate variables, it become apparent that measuring with tax rates did eliminate some, of not all of the reflective nature of the tax revenue variables, and in doing so changed the results of the previous findings. Some of the findings reversed in favor of the hypothesis such as the two sales tax correlations. The

relationship among still other variables weakened significantly and no theory or direction could be derived from the results. Additionally even other variables did not change significantly from the initial findings. However, the fact that the strength of some of the relationships deceased to insignificant levels and some shifted from being negative to positive or vice-versa is interesting. I feel future research must be done to continue testing the findings of this paper. The findings beg further exploration and explanation as to why some variables changed, and some did not, etc…It would be interesting to incorporate additional economic variables such as production data, agricultural data, manufacturing data and inflation.

Previous literature on the subject also suggests that the effects of taxes are determined by how they are spent and re-circulated into the economy. I did not include expenditures in the scope of this research to purposely try to and understand taxes effect on the economy in a general sense. However, future research might take into account expenditures and implement those variables as controls so see if it is the way in which expenditures are used that influence the economy instead of the tax itself.

Above are just a couple suggestions for ways in which this research can be further explored. Tax and economic policies will continue to be a hot topic in the coming months and years and further research on the topic will only continue to shed more light and clarity to this complicated topic.

Appendix A

Table 1.1
Regression Analysis: Impact of States Sales tax on Economic Growth
Indicators (T-Statistics in Parentheses)

	Unemployment	Poverty	GDP
Bivariate Regression	*Standardized coefficient*	*Standardized coefficient*	*Standardized coefficient*
Sales Tax	-.193 (-1.362)	-.399 (-3.0184)*	.575 (4.872)*
R Square	.037	.159	.331
Adjusted R Square	.017	.142	.317
Multivariate Regression	*Standardized coefficient*	*Standardized coefficient*	*Standardized coefficient*
Sales Tax	-.168 (-1.248)	-3.94 (-2.842) *	.559 (4.785) *
Democratic Legislators	.793 (1.990)***	.305 (.745)	-.649 (-1.880)
Percentage African American	-.425 (-1.057)	-.152 (-.369)	.493 (1.414)
College Education or Higher	-.048 (-.333)	-.164 (-1.122)	.175 (1.148)
Union Membership	.233 (1.578)	.027 (.177)	.071 (.557)
R Square	.264	.222	.447
Adjusted R Square	.180	.133	.384

Source: U.S. Census Bureau, Bureau of Labor Statistics, Pollock State Data Set, Bureau of Economic Statistics
Significance: *p<.05, **p<.01, ***p<.1

Table 1.2
Regression Analysis: Impact of Individual Income Tax on economic growth Indictors (T-Statistics in Parentheses)

	Unemployment	Poverty	GDP
Bivariate Regression	*Standardized coefficient*	*Standardized coefficient*	*Standardized coefficient*
Income Tax	-.435 (-3.091)*	-.292 (-1.954)***	.631 (5.203)*
R Square	.189	.085	.398
Adjusted R Square	.169	.063	.383
Multivariate Regression	*Standardized coefficient*	*Standardized coefficient*	*Standardized coefficient*
Income Tax	-.591 (-4.565)*	-.255 (-1.573)***	.582 (4.521)*
Democratic Legislators	-.018 (-.130)	-.143 (-.819)	.141 (1.023)
Percentage African American	.380 (2.985)*	.241 (1.513)	-.163 (-1.293)
College Education or Higher	.025 (.189)	-.077 (-.466)	.176 (1.347)
Union Membership	.502 (3.483)*	.028 (.154)	-.062 (-.434)
R Square	.471	.172	.478
Adjusted R Square	.398	.057	.406

Source: U.S. Census Bureau, Bureau of Labor Statistics, Pollock State Data Set, Bureau of Economic Statistics
Significance: *p<.05, **p<.01, ***p<.1

Table 1.3

Regression Analysis: Impact of Corporate Income Taxes on Economic growth
indicators (T-Statistics in Parentheses)

	Unemployment	Poverty	GDP
Bivariate Regression	*Standardized coefficient*	*Standardized coefficient*	*Standardized coefficient*
Corporate Tax	-.473 (-3.557)*	-.239 (-1.632)	.661 (5.839)*
R Square	.223	.057	.437
Adjusted R Square	.206	.036	.424
Multivariate Regression	*Standardized coefficient*	*Standardized coefficient*	*Standardized coefficient*
Corporate Tax	-.518 (-4.103)*	-.191 (-1.245)	.615 (5.404)*
Democratic Legislators	.012 (.082)	-.161 (-.936)	-.004 (-.028)
Percentage African American	.330 (2.542)***	.173 (1.094)	-.110 (-.938)
College Education or Higher	.034 (.253)	-.103 (-.629)	.142 (1.173)
Union Membership	.316 (2.194)***	.038 (.216)	.147 (1.130)
R Square	.407	.123	.519
Adjusted R Square	.331	.011	.457

Source: U.S. Census Bureau, Bureau of Labor Statistics, Pollock State Data Set, Bureau of Economic Statistics
Significance: *p<.05, **p<.01, ***p<.1

Table 1.4

Regression Analysis: Impact of Property Taxes on Economic growth indicators
(T-Statistics in Parentheses)

	Unemployment	Poverty	GDP
Bivariate Regression	*Standardized coefficient*	*Standardized coefficient*	*Standardized coefficient*
Property Tax	-.117 (-.678)	-.259 (-1.539)	.207 (1.216)
R Square	.014	.067	.043
Adjusted R Square	-.016	.039	.014
Multivariate Regression	*Standardized coefficient*	*Standardized coefficient*	*Standardized coefficient*
Property Tax	-.029 (-.159)	-.151 (-.839)	.161 (.873)
Democratic Legislators	-.024 (-.128)	.098 (.539)	-.241 (-1.293)
Percentage African American	.313 (1.599)	.287 (1.505)	-.185 (-.948)
College Education or Higher	-.104 (-.546)	-.188 (-1.016)	.128 (.676)
Union Membership	.347 (1.682)	.258 (1.286)	.051 (.248)
R Square	.144	.191	.152
Adjusted R Square	-.009	.046	.000

Source: U.S. Census Bureau, Bureau of Labor Statistics, Pollock State Data Set, Bureau of Economic Statistics
Significance: *p<.05, **p<.01, ***p<.1

Table 1.6
Linear Analysis: Comparison Table of Individual Taxes and their Effect on the Economic Indicators (T-Statistics in Parentheses)

	Sales Tax	Individual Income Tax	Corporate Income Tax	Property Tax
	Standardized Coefficient			
Unemployment	-.193	-.435	-.473	-.117
	(-1.362)	(-3.091)*	(-3.557)*	(-.678)
Poverty	-.399	-.292	-.239	-.259
	(-3.0184)*	(-1.954)***	(-1.632)	(-1.539)
State GDP	.575	.631	.661	.207
	(4.872)*	(5.203)*	(5.839)*	(1.216)

Source: U.S. Census Bureau, Bureau of Labor Statistics, Pollock State Data Set, Bureau of Economic Statistics
Significance: *p<.05, **p<.01, ***p<.1

Table 1.5

Bivariate Correlations: The relationship between Tax Rates and Economic Indicators in the year 2009 (P-Values in Parentheses)

	Unemployment	Poverty	GDP
Bivariate Correlation	*Pearson's R Coefficient*	*Pearson's R Coefficient*	*Pearson's R Coefficient*
State and Local Tax Rate	.262 (.075)***	.404 (.005)**	.413 (.004)**
Income Tax Rate	.067 (.669)	-.070 (.655)	.138 (.378)
Corporate Tax Rate	-.100 (.515)	-.399 (.007)**	.109 (.475)
Property Tax	.049 (.737)	-.568 (.000)**	.278 (.050)*

Source: U.S. Census Bureau, Bureau of Labor Statistics, Pollock State Data Set, Bureau of Economic Statistics
Significance: *p<.05, **p<.01, ***p<.1

References

Becsi, Zsolt. (1996) Do State and Local Taxes Affect Relative Economic Growth?, *Federal Reserve Board of Atlanta Economic Review* Vol. 81, (2) pg. 18-36

Clingermayer, James C., Wood, B. Dan. (1995) Disentangling Patterns of State Debt Financing *The American Political Science Review,* Vol. 89, (1), pg. 108-120.

Doucouliagos, C., & Laroche, P. (2003). What Do Unions Do to Productivity? A Meta-Analysis. *Industrial Relations*, 42 (4), 650-691

Gilligan, T., & Matsusaka, J. (2001). Fiscal Policy, Legislature Size, and Political Parties: Evidence from State and Local Governments in the First Half of the 20th Century. *National Tax Journal*, *54*(1), 57-82.

Hanushek, E. A., and Wobmann, L. (2007). *The quality of education and economic growth.* Washington DC: The World Bank.

Helms, L. (1985). The Effect of State and Local Taxes on Economic Growth: A Time Series-Cross Section Approach. *Review of Economics & Statistics*, *67*(4), 574.

Kelly, J. (2003). "Local Government Fiscal Autonomy: The Threat of Fiscal Centralization" *Paper presented at the annual meeting of the American Political Science Association, Philadelphia Marriott Hotel, Philadelphia, PA Online* <.PDF>. 2009-05-26 from http://www.allacademic.com/meta/p62108_index.html

Kim, Se-Jik (1998) Growth effect of taxes in an endogenous growth model: to what extent do taxes effect economic growth? *Journal of Economic Dynamics and Control*, Vol. 23, pg. 125-158.

Lee, Young, Gordon H. Roger (2005) Tax Structure and economic growth. *Journal of Public Economics,* Vol. 89, pg. 1027-1043

Milesi-Ferretti, Gian M., Roubini, Nouriel (1998) Growth Effects of Income and Consumption Taxes. *Journal of Money, Credit and Banking*, Vol. 3, (4) pg. 721-744

Mofidi, Alaeddin, Stone A. Joe. (1990) Do State and Local Taxes Affect Economic Growth?, *The Review of Economics and Statistics*, Vol. 72, (4) pg. 686-691

Moore, Stephanie, Hermann, Grover H. 1989) Taxes, Economic Growth, and Budget Deficits: What Washington can Learn From the States. *Heritage Foundation Reports* Backgrounder; No. 722. Retrieved from LexisNexis Academic. http://www.lexisnexis.com/us/lnacademic/search/homesubmitForm.do

Roemer, Michael, and Mary Kay Gugerty. (1997) Does Economic Growth Reduce Poverty. *CAER I Discussion Paper No. 5*. Cambridge, MA.: Harvard Institute for International Development.

Scully, Gerald W. (2006) Taxes and Economic Growth, *NCPA Policy Report*, No. 292

Wasylenko, Michael, McGuire, Therese (1985). Jobs and Taxes: The Effect of Business Climate on States' Employment Growth Rates, *National Tax Journal*, Vol. 38, (4) pg. 497-511