

**Cracking the Tax Codes:
How State Tax Laws Influence the
Number of Manufacturing Jobs
within Their Borders**

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Contents

Abstract.....	3
Introduction.....	4
Literature Review.....	6
Methods and Data.....	12
Findings.....	13
Discussion.....	24
Appendix A.....	27
References.....	32

Abstract

With the recent economic downturn, jobs have been at the forefront of people's concerns. Policy makers in every state have promised their constituents new jobs. Of particular importance are high paying jobs. Manufacturing jobs tend to be a well-paying and highly sought after form of employment. However, in recent decades, the percentage of manufacturing jobs has been declining in the United States. Also, manufacturing facilities have shown an increased likelihood of relocating to different states. I theorize that manufacturing facilities relocating and expanding in different states is primarily due to state tax policies. This phenomenon has increased within recent years due to the increased mobility associated with the digital age. I hypothesize that states with lower individual income taxes, corporate income taxes, and sales taxes will have a greater percentage of their economy made up of the manufacturing sector. Analysis of Bureau of Economic Analysis data indicates mixed results. Further study is merited. Constructing state tax codes to promote the highest amount of economic growth is a continuous on-going challenge in this fast changing world. It is the goal of this research to gain further insight on how to promote the growth of the manufacturing sector.

Introduction

Where to locate a business? This is a question that has perplexed many people. It is influenced by numerous factors. The ideal places for businesses to locate are continually changing. New markets appear. New technology brings new opportunities that make some locations more ideal. Geography influences the locations of businesses. Public policy also influences the idealness of a location for business.

The appropriate form of public policy to employ is often a point of contention. Conservative leaning voices such as *Forbes* and the Tax Foundation argue that taxes play a major role in whether or not a particular area is attractive for business location. They contend that higher taxes significantly drive up business costs. Thus, as a result states that have lower tax burdens will be more conducive for business.

On the other hand, left leaning voices such as the Economic Policy Institute contend that taxes play a lesser role in producing an ideal business climate. They claim that taxes have a minimal role upon businesses while public spending has a much more significant role to play. They see an area's attractiveness to businesses best enhanced by well-funded public concerns such as infrastructure and school systems. There is a continuous ongoing debate between these two competing views. As time goes on and society and the economy evolve, the specifics of these arguments shift.

The digital age has majorly impacted business dealings. The technology associated with the digital age has significantly lessened numerous business costs and eased the difficulties of having certain aspects of one's business farther away from other key locations. Thanks to the many wonders of new technology it is now easier for companies to locate in areas where prior to the digital age the distance and availability to certain markets made some locations undesirable.

Since the world is now a more mobile place, businesses are freer to move about and to choose locations that at one point would have been disagreeable.

Tax policy is often at the forefront of whether or not a particular area is an ideal place for a business to locate. In an era where technology has significantly influenced business dealings, I theorize that tax policy has taken a more important role concerning where a business chooses to locate. This paper seeks to examine the importance of tax policy among the fifty states of the United States specifically concerning how such policy influences the manufacturing sector. In an era where access to markets has increased and liabilities associated with distance have diminished, this paper theorizes that the influence of state taxes upon business costs takes on a new level of importance. Manufacturing facilities will seek to expand into states where state tax policies lower their business costs especially with the increased mobility of this present time.

Literature Review

Factors Influencing Business Locations and Expansions

John P. Blair and Robert Premus (1987) provided a thorough examination of what factors effect where industries locate. They examine what is considered to be the traditional location factors and contrasted those with the newly emerging location factors. The results were an in-depth look at what was affecting businesses to locate where they were.

Their work, however, is dated as it was written in 1987. The traditional factors influencing business locations were recognized as having an impact since the 1960s while the new factors were emerging in the 1980s. The factors examined in this article were prior to the digital age. There were new technologies emerging in the 1970s and 80s. However, they had a different kind of force than the new technologies of the digital age have had upon the economy. With these new technologies, the role of taxes in determining business locations has only increased since the time of this article. Taxes may not be the most important factor in determining where businesses locate, but they are definitely much more important than they used to be.

The determinants of locational choices change as conditions of production change (Blair and Premus 1987 72). As Blair and Premus discovered, the factors influencing where businesses locate change as conditions of production change. This could not be any truer in the digital age. With the advent of new technology, access to markets has been increased and distances have diminished. This has led to a shift in the importance of particular factors acting as determinants for business locations. The phenomena is important as it provides potential for many new and emerging markets to increase and places pressure upon established markets to further grow and diversify.

Access to markets, labor, transportation and raw materials were considered to be the traditional factors influencing an area's attractiveness to businesses. However, other factors have emerged in recent decades to also play a considerable role. These include: state and local taxes,

education, business climate, labor skills, and state and local physical infrastructure (Blair & Premus 83). These changes have come about as a result of a changing economy and technology.

The effects of new technology were assessed within this article. The primary impact of technical change has been to reduce the significance of proximity to raw materials and to increase proximity to markets as a locational factor (Blair and Premus 80). They further went on to identify technology as lowering transportation costs and reducing the importance of raw materials.

The impact of state and local taxes was also addressed by Blair and Premus. Studies have found that in recent years, state and local taxes have had an important effect on business location (Blair and Premus 1987 80). This statement highlights the significance of examining the role of taxes in the digital age. It is my belief that taxes have only increased in importance as a factor determining where businesses choose to locate in the years since this article was written. In such a situation, factors more closely tied to geography have lessened in importance. Transportation along waterways and proximity to natural resources, although still important, would have lessened in economic importance while factors such as business costs related to taxes would have increased in importance. This provides areas with a different unique set of circumstances upon which to capitalize.

Bartik (1985) provides key insights into factors affecting business locations. Chief among the findings of this article was the effect of unionization within a state in determining business locations. A 10% increase in the percentage unionized of a state's labor force is estimated to cause a 30-45% reduction in the number of new branch plants. Also, the evidence suggests that even when businesses choose among states within a region, unionization is an important consideration. This was an emerging locational factor in the 1980s from changes within state, national and global economies. I will reexamine the effect of unionization to see if it has continued to be a force in determining business locations and to what extent it interacts with the role of taxes.

Bartik also noted that a 10% increase in a state's corporate income tax rate is estimated to cause a 2-3% decline in the number of new plants. Also, a 10% increase in a state's average business

property tax rate is estimated to cause a 1-2% decline in the number of new plants. The article further noted that modest cuts in state business taxes are unlikely to cause a massive influx of new business.

Tax Policies

Cornia, Edmiston, Sjoquist and Wallace (2005) do a good job of bringing up many modern day concerns about taxing corporations. The authors sought to identify reasons why despite increasing corporate profits, state revenues from state corporate income taxes have been declining. According to their research, tax planning and changes in industrial structures have been influential in the decline in state revenues from state corporate income taxes. It was also identified that for certain years a decline in profits had played a role as well (Cornia, Edmiston, Sjoquist & Wallace 2005).

Besides pointing out the effects of the above mentioned concerns, they cast light upon the situation when a state faces a loss in revenue. It also brings up the classic question, what is the appropriate balance between state expenditures and low tax rates? This question is a constant topic of much debate among liberals and conservatives. Businesses desire low taxes as this helps lessen their business costs. However, businesses also have voiced desires to have things such as a highly educated workforce and well maintained state infrastructure, which are dependent upon state revenues. The question about how to balance these concerns is a good one for consideration. I will attempt to measure such variables against the current importance of taxes upon business locations.

Gupta, Moore, Gramlich, and Hofmann (2009) further study state corporate income taxes. They find that states have been active in modifying the structures of their state corporate income taxes to differentiate them from the tax laws of other states in attempts to attract/retain economic activity within their borders. This has led to a lot of specific and unique situations within states that make examining the issue of state corporate income taxes much more complex. Specifically, two points were found to be significant in generating significant state revenues of between 15-20%. These were the use of a throwback rule and possessing a broad definition of business income. These

two points illustrate the importance of being familiar with all aspects of state tax law surrounding a particular tax. It is not just the rates that are important.

Gupta, Moore, Gramlich, and Hofmann discovered that states readily try to make specific incentives to try to attract and keep businesses within their borders. However, it was also noted that more and more states are moving to broaden their corporate tax bases and to thwart strategic tax planning by multistate corporations. These efforts to simplify the tax code and to enlarge the tax base are interesting phenomena. These developments will need to be considered when investigating overall corporate income tax collections by a state. Specifically it should be examined how these factors relate to the overall tax rate for the corporate income tax.

Chirinko and Wilson (2010) examine the issues of tax credits and the corporate income tax upon investment and output. Specifically, the authors examine the equipment and structures tax credit and the research and development tax credit. Job tax credits such as these are a fairly recent phenomenon. They have been implemented by about half the states within the past decade. These tax credits were used within specific differing parameters within the twenty plus states that have them. The effectiveness of these tax credits upon investment and output was mixed.

The short term versus long term debate within tax policy was addressed by the authors. They state that additional information is required concerning the revenues that are decreased initially due to the tax incentives and increased eventually due to higher levels of economic activity. Moreover, second-round effects need to be considered. These tax credits may lead to reduced revenues in the short term, but advocates argue that they will be worth the investment in the long term. As an emerging form of tax policy, tax credits may become an increasingly important piece of tax policy in the future. They definitely hold the potential to impact the total revenue generated from a state's corporate income tax for better or worse.

Harden and Hoyt examine the mixture of taxes employed by states. The authors specifically focused upon sales tax, individual income tax and corporate income tax since these are the three most

widely used general taxes throughout the states. Their work examined the mix of these three taxes upon a state's level of employment and revenues.

The authors found corporate income tax to be statistically significant upon levels of state employment and revenues. They also found the sales tax variable to be statistically significant upon state revenues. The authors claimed that shifting a percentage of total state revenue from the corporate income tax to the sales tax will have a slightly greater impact on the growth in employment. They further claimed that shifts in collections from individual income taxes to sales taxes will have little impact on employment. They further specified that the true worth of this policy proposal would be seen in the long term since the gains from this policy change would be small but would add up over time. Overall, the results of their tests suggested that the employment maximizing mix of taxes should consist of lower rates on corporate income taxes relative to sales tax rates and individual income tax rates.

Their results indicate that higher levels of a corporate income tax have statistically significant negative impacts on the rate of growth in employment. While a negative impact on employment levels from increases in the individual income tax and sales tax was found, these results were not statistically significant. Over a relatively long time, such as twenty years, their results indicate that a revenue shift of ten percent away from the corporate tax to either the sales or individual income tax would result in a change in employment of approximately 1.7 percent. Thus, according to their study, the corporate income tax appears to have the greatest impact upon the employment level within a state.

Harden and Hoyt also examined the effect of states' tax rates upon drawing in businesses from neighboring states. They tried to empirically control for the impacts of the taxes of border states upon neighbor states' levels of employment. Little evidence was found to indicate that these taxes matter. Although the authors specified that a study examining the impact of state tax rates upon border counties was merited (Harden & Hoyt 23).

The findings of these articles point to the value of my research question. Taxes do play an important role concerning state employment levels. In the digital age, this role has likely increased. In attempting to recognize the importance of state tax policies upon location and expansion of manufacturing facilities in this present era, this paper will examine three hypotheses:

In a comparison of the fifty US states, those with lower sales taxes draw in more new manufacturing jobs than those with higher sales taxes.

In a comparison of the fifty US states, those with lower individual income taxes draw in more new manufacturing jobs than those with higher individual income taxes.

In a comparison of the fifty US states, those with lower corporate income taxes draw in more new manufacturing jobs than those with higher corporate income taxes.

Many others factors still play a role in the selection of new business sites. Such factors may vary from geographic location to levels of education. However, while such factors are still important, state tax policies have risen in importance in the past years and will continue to be highly influential upon where businesses choose to locate.

Methods and Data

Defining Independent and Dependent Variables

Dependent Variable

The units of analysis for this analysis are the fifty US states. My database was built using information from the Census Bureau and the Bureau of Economic Analysis. My dependent variable was designed to measure manufacturing GDP per capita from 2001 through 2011. The dependent variable indicates the difference in per capita manufacturing GDP between the years 2001 and 2011. The dependent variable was crafted by taking the manufacturing GDP of a state (measured in millions), which was derived from the Bureau of Economic Analysis, and dividing it by the population of that state (measured in thousands), which was derived from the Census Bureau. This result was figured out for both 2001 and 2011. The total for 2001 was subtracted from the total for 2011 giving us the dependent variable.

Independent Variables

Three independent tax variables were used in this analysis. The first independent variable represents the percentage change in a state's total sales tax between 2001 and 2011. It was crafted by taking the sum of a state's total sales tax and dividing it by that state's total tax revenue. Both of those figures were derived from the Census Bureau. This data came from the Annual Surveys of State Government Tax Collections. This action was done for every state for both 2001 and 2011. The resulting percentage for 2001 was then subtracted from the percentage of 2011.

The second independent variable represents the percentage change in a state's total individual income tax between 2001 and 2011. It was crafted by taking the sum of a state's total individual income tax and dividing it by that state's total tax revenue. Both of those figures were

derived from the Census Bureau. This action was done for every state for both 2001 and 2011. The resulting percentage for 2001 was then subtracted from the percentage of 2011.

The third independent variable represents the percentage change in a state's total corporate income tax between 2001 and 2011. It was crafted by taking the sum of a state's total corporate income tax and dividing it by that state's total tax revenue. Both of those figures were derived from the Census Bureau. This data also came from the Annual Surveys of State Government Tax Collections. This action was done for every state for both 2001 and 2011. The resulting percentage for 2001 was then subtracted from the percentage of 2011.

Findings

I tested my hypotheses by using scatterplots, correlation and regression. The scatterplots allow me to have a visual representation of any relationships. The correlations will provide me with the statistics that illustrate the strength or weakness of these potential relationships, and the regressions will show how much manufacturing GDP per capita was impacted by the independent variables. I expect to find a strong negative association between the dependent variable and each of the independent variables. This should be illustrated with each scatterplot and supported statistically with the results of the correlations and regressions.

(Figure 1 about here)

Figure 1 examines the relationship between the dependent variable and the independent variable sales tax. The scatterplot indicates a weak relationship. The slope of the regression line barely is negligible. A weak negative relationship is indicated. Most states experienced an increase in the percentage of total sales tax or no change at all. The cases that experienced a decrease in the percentage of total sales tax appear to have had slightly more growth in the manufacturing sector.

(Figure 2 about here)

Figure 2 examines the relationship between the dependent variable and the independent variable individual income tax. This scatterplot indicates a weak relationship. The regression line barely has an incline. A slight positive relationship is indicated, which is contrary to the hypothesis. There are a number of cases that had zero change in percentage of individual income tax because they do not have an individual income tax. These cases may be having a notable effect upon the regression line. Cases are spread out considerably in this scatter plot. A number of cases experienced growth in manufacturing while experiencing an increase in the percentage of individual income tax. Other cases also experienced growth in the manufacturing sector while experiencing a decrease in the percentage of individual income tax.

(Figure 3 about here)

Figure three examines the relationship between the dependent variable and the independent variable corporate income tax. This scatterplot indicates a weak relationship. The regression line barely has an incline. It indicates a slight negative relationship. Most of the states were close to zero indicating that they had only a small increase or decrease in corporate income taxes between 2001 and 2011. There doesn't appear to be a strong relationship here.

(Table 1 about here)

The first correlations were run focusing upon the variables used in each scatterplot. The dependent and independent variables remained the same. The statistics mostly mirrored what was revealed through the scatterplots. The statistics for the correlation between the dependent variable and the independent variable regarding total sales tax do not indicate a strong relationship. The Pearson correlation is only $-.036$ and is not significant. This indicates only a slight negative relationship between the two variables as suggested by the scatterplot.

The statistics for the correlation between the dependent variable and independent variable regarding total individual income tax do not indicate a strong relationship. The Pearson correlation is only .039 and is not significant. This indicates a slight positive relationship between the two variables as suggested by the scatterplot. Thus, this correlation also moves in the opposite direction of the hypothesis.

The statistics for the correlation between the dependent variable and the independent variable regarding total corporate income tax do not indicate a strong relationship. The Pearson correlation is only -.050, which indicates a slight negative relationship.

Since these correlations did not reveal strong significance, I decided to perform more analysis with different independent variables suggested by the literature for their effect upon the dependent variable. I performed eleven more correlations focusing on a wide variety of possible business locational factors. My results were mostly insignificant. However, there were some interesting points to mention.

The eleven independent variables focused upon the following topics within states: unemployment rate, percent of urban population, percent of labor union members, percent of the mass public identifying as conservative, percent of the mass public identifying as Republican, percent of the population with a college degree, percent of population with a high school degree or higher, federal defense expenditures per capita, percentage of the population 18-24 years old, and percentage of the population 65 and older. Only two of these variables were significant in relation with the dependent variable. I chose to include these two variables along with any that had a P value of .3 or below in Table 1. I included these values, which were close to being statistically significant. This was done in order to further understand the relationships that came close to having statistical significance along with those that did have statistical significance.

The unemployment rate was one of the two independent variables that were significant in regards to its effect upon the dependent variable. Its Pearson correlation was .289, and its P value was .042. This indicates that as the unemployment rate goes up so does manufacturing GDP per capita. These two variables possess a positive relationship. This helps to illustrate the importance of the labor force in the process of choosing business locations. More available workers appear to be a draw for a manufacturing facility.

The independent variable, percentage of the population 18-24 years old, was the other significant independent variable. Its P value was .056 just beyond the .05 threshold. This may support the point that manufacturing facilities are drawn to areas where there is a great abundance of potential workers. 18-24 year olds are more likely to be looking for a job than many other age groups. The independent variable, percent of the population 65 or older, may have had the opposite effect. Since most people in this age group are not seeking out new jobs especially full time jobs, a manufacturing facility may have been somewhat deterred from a location if it had a higher than average percentage of senior citizens. However, these results may also be reflective of states, which are growing or shrinking and as a result have more or less markets and more or less labor. This happening may not be based primarily upon the ages of a state's residents.

The variable, percentage of the population with a high school degree or higher, had a Pearson correlation of -.232 and a P value of .105. The variable, percentage of the population with a college degree, had a Pearson correlation of -.075 and a P value of .603. The interesting finding with these variables was that increased education displayed a negative relationship with manufacturing GDP per capita. As levels of education rise, manufacturing GDP per capita

declines. This relationship runs against some of the findings of previous research and downplays the significance of education as a factor determining where manufacturing facilities locate.

Some studies claim that an area's attitudes towards business can be a pro or a con to businesses considering locating there. The independent variable, percentage of the mass public identifying as conservative, was used with this claim in mind. The Pearson's correlation for this variable was .167, and its P value was .247. Although the numbers are not statistically significant, a positive relationship is indicated. It is possible that a region that has a less critical view of business may be more enticing than one with less hospitable attitudes. Interestingly, the variable, percentage of the population identifying as Republican, had less than half of the significance of the above mentioned variable. Its P value was .513, and its Pearson correlation was .095. The relationship was still positive with the dependent variable but considerably less significant.

The variable, federal defense expenditures per capita, had a Pearson's correlation of $-.156$ and a P value of .281. This was an interesting finding since numerous defense expenditures involve manufacturing facilities. I was surprised to see a negative relationship represented. I assumed that there would be a positive relationship since federal defense spending has the potential to generate a notable level of manufacturing within an area.

The remaining independent variables all had P values over .3. Percentage of urban population had a P value of .764 and a Pearson's correlation of .044 indicating that it had minimal effect upon where manufacturing facilities locate. It appears that manufacturing facilities are drawn to both rural and urban locations.

Percentage of workers who are union members appeared to have little effect upon the dependent variable. Its Pearson's correlation was $-.075$, and its P value was .605. Unionization

was cited as a considerable factor in determining where businesses locate in previous literature. These findings contradict that notion.

(Table 2 about here)

Regressions were run on multiple variables. The variables can be divided into two categories_ economic variables and demographic variables. Regressions were run using the variables noting percentage change in total sales tax between 2001 and 2011, percentage change in individual income tax between 2001 and 2011, and percentage change in corporate income tax between 2001 and 2011. The regression coefficient for percentage change in total sales tax was -2.250, and the beta coefficient was -.059. The regression coefficient for percentage change in individual income tax was 1.279, and the beta coefficient was .012. The regression coefficient for percentage change in corporate income tax was 13.046, and its beta coefficient was .181. None of these variables were shown to be statistically significant. However, it should be noted that with a P value at .312 percentage of corporate income tax had a significance three times greater than that of percentage of individual income tax and more than double the significance of percentage of total sales tax.

The remaining economic variables were unemployment rate within a state and federal defense expenditures per capita within a state. The regression coefficient for unemployment was .670, and its beta coefficient was .337. The regression coefficient for federal defense expenditures was .000, and the beta coefficient was -.123. The P value for federal defense expenditures was statistically insignificant. However, unemployment did have a statistically significant P value at .077.

The demographic variables included: percentage of state population 18-24 years old, percentage of state population age 65 and older, percentage of the mass public conservative and

percentage of population with a high school degree or higher. The percentage of state population 18-24 years old had a regression coefficient of .698 and a beta coefficient of .284. The percentage of state population age 65 and older had a regression coefficient of -.092 and a beta coefficient of -.080. Percentage of the mass public conservative had a regression coefficient of -.007 and a beta coefficient of -.019. The percentage of population with a high school degree or higher had a regression coefficient of -.006, and it had a beta coefficient of -.011. None of these variables were statistically significant. However, with a P value of .122, percentage of the population 18-24 years old came close to being statistically significant. The adjusted R square for all of these variables had a value of .020.

There appeared to be a lot more ways to study the topic of taxes upon business locations especially in light of what the literature has addressed. The Bureau of Economic Analysis had the manufacturing sector divided into subsets. I took full advantage of this setup and ran analysis upon each different subset. I experienced a wide array of results from this analysis.

Dependent Variables

This portion of my analysis dealt exclusively with correlation and regression. There were nineteen different dependent variables based upon the nineteen different manufacturing subsets listed by the Bureau of Economic Analysis. The task of managing all of these variables was not an especially difficult one because each of the variables was derived by using the same method. In creating these variables, I took the specific subset's real GDP per capita from 2010 and subtracted the subset's 2001 real GDP per capita from the 2010 total. The resulting difference for each subset served as my dependent variables. In total these nineteen new dependent variables were based upon the following manufacturing subsets: computer and electronic product, plastic and rubber, electronic equipment appliance and component, machinery, motor vehicle body

trailer and parts, furniture, other transportation equipment, miscellaneous, apparel leather and applied products, textile, paper, printing chemical, wood product, nonmetallic mineral, primary metal, fabricated mineral, food, beverage & tobacco, and petroleum and coal.

For independent variables, I used the same variables that I had used in analyzing the manufacturing industry as a whole. The main variables of focus were once again the tax variables. These were the variables most closely tied to my hypotheses. As before, the first independent tax variable represents the percentage change in a state's total sales tax between 2001 and 2011. The second independent variable represents the percentage change in a state's total individual income tax between 2001 and 2011. The third independent variable represents the percentage change in a state's total corporate income tax between 2001 and 2011. The means of crafting these variables remained the same as in the previous industry wide analysis.

The regressions revealed a myriad of results. For simplicity's sake, I only included the same economic and demographic variables on the table as I did with the industry wide analysis. The table can be located in the appendix. The results were interesting. There was a definite variety as each subset had a unique set of results. Percentage of a state's population identifying as conservative, percentage of a state's population having graduated high school, and sales tax were not significant to any of the dependent variables. The fact that percentage of a state's population identifying as conservative was not significant for any subset was surprising as this was close to being significant for the manufacturing industry at large. However, percentage of a state's population identifying as Republican was significant for a couple of subsets.

Federal defense expenditures proved to be significant for two subsets. Not surprisingly these included machinery and miscellaneous manufacturing. Federal defense expenditures appear to have a sizable impact upon these subsets.

The tax variables illuminated some interesting results. The sales tax variable was not significant for any subset. However, it came somewhat close a number of times. Specifically, if the subset was a geographically bound subset, such as primary metal, the P value of the sales tax came much closer to being statistically significant than if it wasn't a geographically bound subset. If the sales tax showed greater significance, this was usually at the expense of the individual income tax. The individual income tax by far appeared to be the least significant tax across the board. It only was statistically significant for the furniture subset. Most of the time, the individual income tax was nowhere near being statistically significant. The corporate income tax, however, was a completely different story. Although this tax was only significant for the paper and apparel leather and applied products subsets, it came notably close to being statistically significant for numerous other subsets. About the only time it wasn't the tax with the most significance out of these three was when the sales tax was shown to be more significant for a geographically bound subset. Out of these three taxes, the corporate income tax was by far the most influential according to the regressions.

As with the manufacturing industry as a whole, the independent variables dealing with characteristics of the workforce proved to be the most significant most often. A state's unemployment rate proved to be a significant factor for four subsets while the percentage of a state's population age 18-24 years old proved to be statistically significant for seven subsets. This was close to half of the subsets. Characteristics of the workforce such as youth and availability appear to be significantly important to industries. The food, beverage and tobacco subset, primary metal subset, nonmetallic mineral subset, printing subset, miscellaneous subset and the apparel, leather and applied products subset were the ones where a state's percentage of

18-24 year olds proved to be significant. Out of these subsets, the geographically bound, labor intensive subsets were the ones where this variable was the most significant.

The correlations are illuminating. The independent variables, percentage of a state's population identifying as conservative and percentage of people having a high school education or higher, both had correlations with subsets that were statistically significant. However, neither of these independent variables retains any statistically significant relationship with any subsets in the regression. Thus, it appears that this is a mere correlation not a causality relationship between these variables.

The independent tax variables had interesting results. The sales tax did not have any variables with which it was statistically significant. However, both the individual income tax and corporate income tax showed statistical significance with subsets. The individual income tax was statistically significant with the computer and electronic subset. However, this significance went away in the regression analysis. The corporate income tax was statistically significant with the apparel, leather and applied product subset and the paper subset. Significance was maintained between the corporate income tax and both of these dependent variables in the regression analysis. This demonstrates that the negative relationship between these variables appears to have a causal influence.

By far the variables dealing with characteristics of the workforce displayed the most instances of statistical significance with the dependent variables. A state's unemployment rate was statistically significant with four subsets. Three of these subsets maintained their statistical significance with the unemployment rate in the regression analysis thus demonstrating the likelihood of causality within this relationship.

A state's percentage of 18-24 year olds demonstrated statistical significance with the most subsets. It was statistically significant with nine subsets. These included the following: printing, apparel leather and applied products, machinery, furniture, petroleum and coal, food, beverage and tobacco, fabricated mineral, primary metal, and nonmetallic mineral. In the regression analysis no significance remained between a state's percentage of 18-24 year olds and the machinery, petroleum and coal, and fabricated mineral subsets. Yet, in the same regression analysis, state's percentage of 18-24 year olds remained statistically significant with the rest of the subsets and also became statistically significant with the furniture and miscellaneous subsets. By far the 18-24 year old variable was the most influential of the independent variables. The 18-24 year old variable obviously has influence upon manufacturing sectors.

Discussion

There are mixed results concerning the hypotheses. The scatterplots indicated only weak relationships between the dependent variable and the independent variables concerning taxes. The correlations only backed this up. None of the relationships were found to be significant. The relationship between individual income taxes and per capita manufacturing GDP was shown to have a positive relationship in both the scatterplot and correlation. This was in direct contradiction to the hypothesis, which stated that they should have a strong negative relationship.

The findings surrounding the corporate income tax appear to be of the greatest effect. The regression coefficient and beta coefficient for this variable were much greater than the regression coefficient and beta coefficient of the sales tax variable and individual income tax variable. These findings are also indicative of the claims in the literature, which stated that out of the sales tax, individual income tax and corporate income tax, the corporate income tax was most influential upon state employment levels.

The varied results concerning the other variables examined through correlation and regression demonstrate a key point addressed in previous studies. Businesses are influenced by a wide myriad of factors when determining locations. Each factor plays a role. Depending upon the particular industry and specific needs of an individual business certain factors may be of greater importance than others.

The analysis of the subsets especially demonstrates this point. Some factors were much more influential upon specific manufacturing subsets than other subsets. Taxes were much more significant upon some subsets than others. Other manufacturing subsets were more influenced by education. Still others were influenced by unionization and/or political climate. It illustrates the challenges facing policy makers. One has to carefully and strategically manage resources in

order to best capitalize upon economic opportunities. What fits one business best might suit another well. Policy makers need to be continuously reviewing and instrumenting new ways to improve the economic viability of their communities.

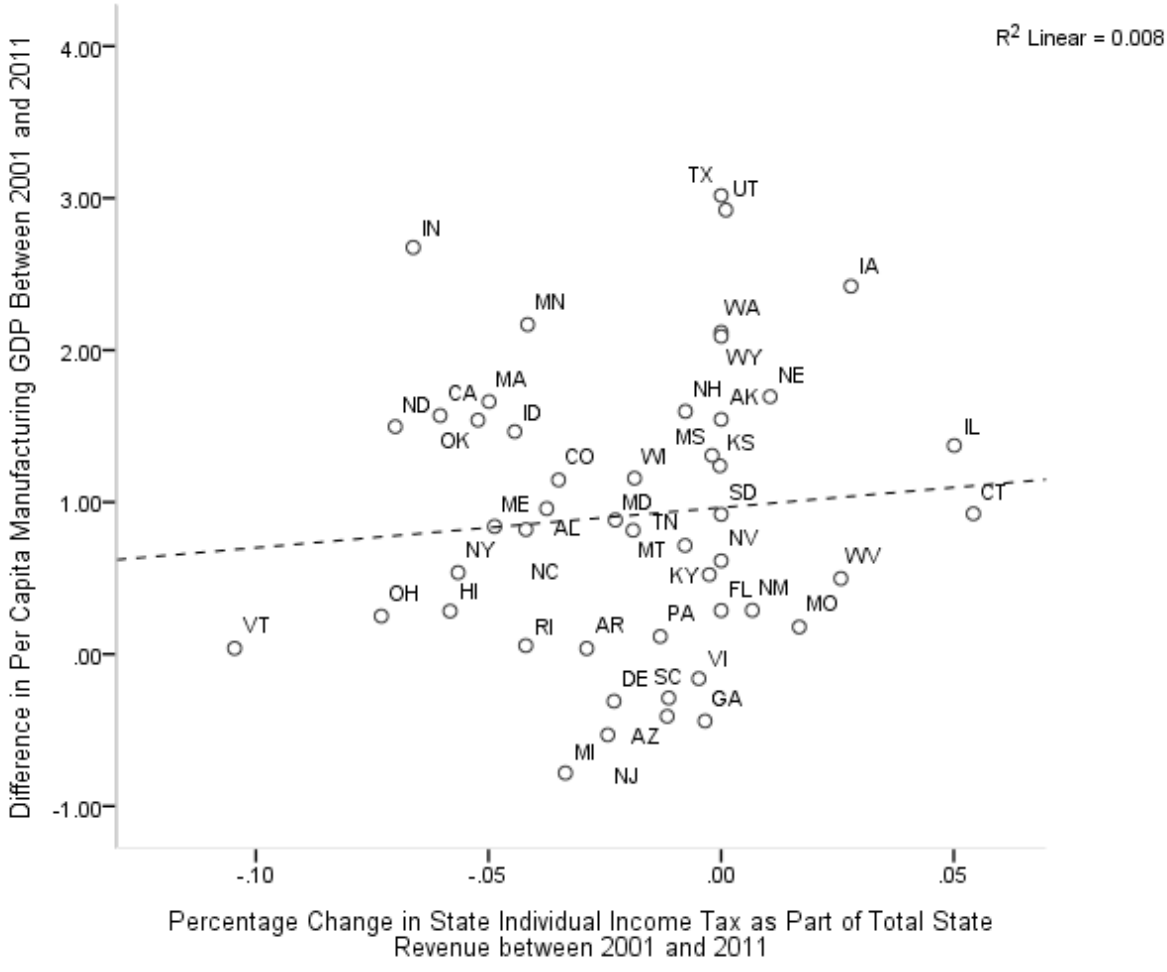
The biggest discovery of the analysis appears to be the influence of the characteristics of the workforce especially the availability of 18-24 year olds within an area. The percentage of 18-24 year olds had a positive relationship with every dependent variable it was tested against. Time and time again it either had statistical significance with the dependent variables or came very close to having statistical significance with the dependent variables. The abundance of 18-24 year olds within a state appears to be a key attraction to a manufacturing facility.

The emerging locational factors of the 1980s appear to still possess an effect upon where businesses locate. The previous traditional factors continued to have a role as well. Geographical concerns and labor concerns continued to be highly influential as well as taxes. The importance of taxes in determining where businesses locate may be a matter of debate. However, it should be noted that they still do possess importance. This emerging locational factor hasn't gone away and will likely continue to be influential upon where manufacturing facilities locate in the years ahead.

This study was illuminating and touched upon many factors. However, there are still other variables that could be examined to note their effects. Possible factors to consider in this continued study would include: climate, going wage, infrastructure, economic climate, economic forecast, poverty rates and crime rates. Each of these factors can influence whether or not a place is a good location for a manufacturing facility. Each should be examined in order to better isolate the true effect of state tax policies towards business locations.

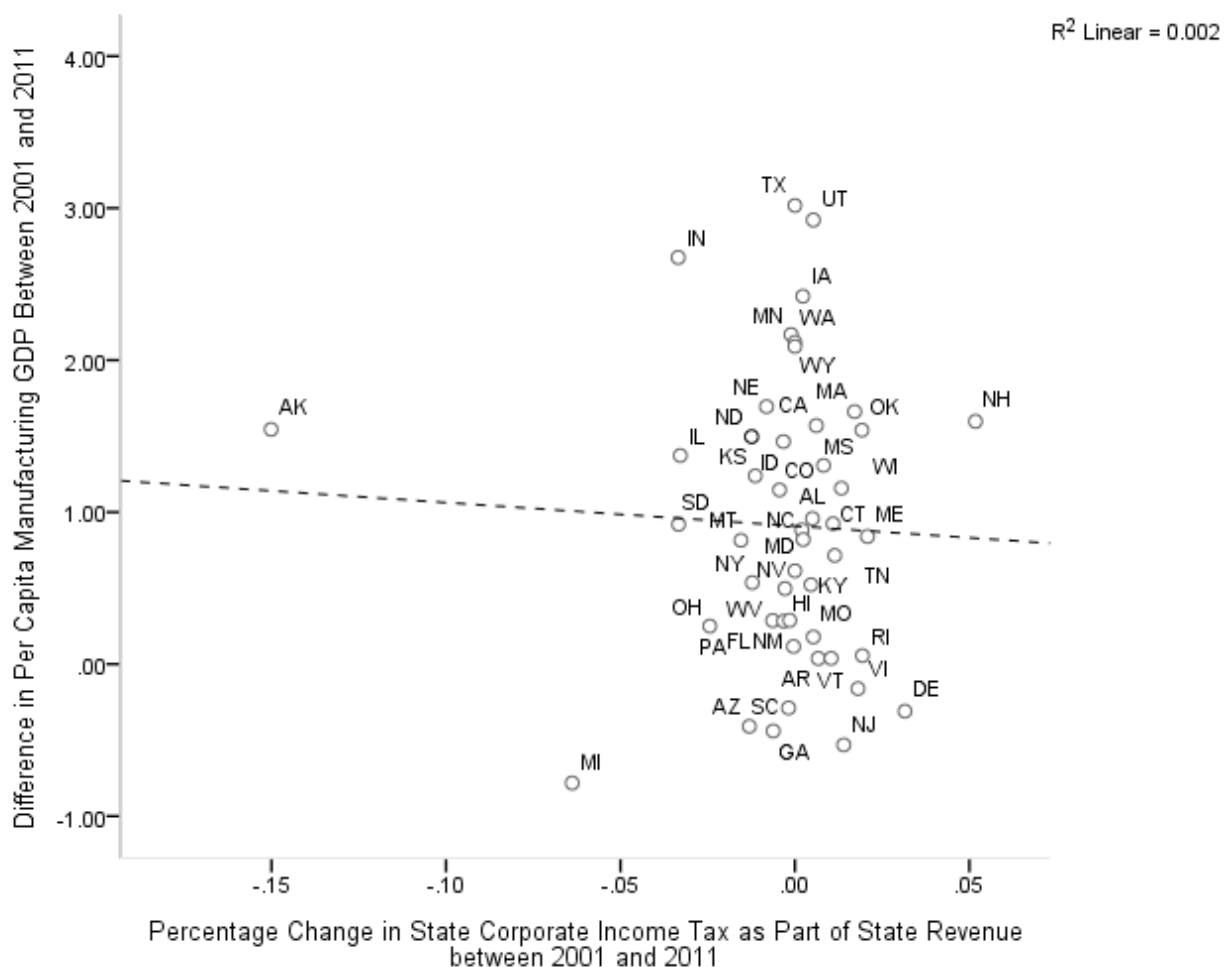
It would also be beneficial to run the same analysis with 1980s economic data. If the literature is to be believed, factors such as taxes should have risen in significance from that time. To compare the data from the 1980s with the past decade would be an excellent comparison and would shed great light upon the accuracy of my hypotheses. One would be able to get a much better picture if taxes have indeed risen in importance with the advent of the digital age. All in all, the hypotheses were not proven true. However, their worth could possibly be demonstrated with this additional study.

Figure 2 Scatterplot Displaying Relationship Between Individual Income Tax and Manufacturing GDP



Percentage change in total individual income tax was derived by determining what percentage total individual income tax composed of total state revenue was for both 2001 and 2011. The percentage change of 2001 was then subtracted from the percentage change of 2011.

Figure 3 Scatterplot Displaying Relationship Between Corporate Income Tax and Manufacturing GDP



Percentage change in total corporate income tax was derived by determining what percentage total corporate income tax composed of total state revenue was for both 2001 and 2011. The percentage change of 2001 was then subtracted from the percentage change of 2011.

Table 1

Correlation Coefficients with Change in Manufacturing GDP Per Capita as Dependent Variable

Economic Variables	Coefficient
Percentage change in state <i>total sales tax</i> between 2001 and 2011	-.036
Percentage change in state <i>individual income tax</i> between 2001 and 2011	.039
Percentage change in state <i>corporate income tax</i> between 2001 and 2011	-.050
Unemployment rate within state	.289*
Federal defense expenditures per capita within state	-.156
Demographic Variables	Coefficient
Percent of state population 18-24 years old	.272*
Percent of state population age 65 and older	-.162
Percent of the state's mass public identifying as conservative	.167
Percent of state population with high school degree or higher	-.232

*sig at .10, ** sig at .05, *** sig at .01

Table 2

Regression Results with Change in Manufacturing GDP Per Capita as Dependent Variable

Economic Variables	Regression Coefficient	Beta Coefficient
Percentage change in <i>total sales tax</i> 2001 and 2011	-2.250	-.059
Percentage change in <i>individual income tax</i> 2001 and 2011	1.279	.021
Percentage change in <i>corporate income tax</i> 2001 and 2011	13.046	.181
Unemployment rate within state	.670*	.337*
Federal defense expenditures per capita within state	.000	-.123
Demographic Variables	Regression Coefficient	Beta Coefficient
Percent of state population 18-24 years old	.698	.284
Percent of state population age 65 and older	-.092	-.080
Percent of the mass public conservative	-.007	-.019
Percent of population with high school degree or higher	-.006	-.011

*sig at .10, ** sig at .05, *** sig at .01

Constant -7.140

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Table 3
Regressions for Manufacturing Subsets
 Body Other Transportation

Trailer & Parts
Economic Variables

		Electronic Equipment, Furniture Appliance & Component Equipment	Motor Vehicle
Percentage change in total sales tax between 2001 and 2010		-.196 (.191) (.540) (.092)	-.154 (.629)
Percentage change in total individual income tax between 2001 and 2010		-.122	.183
.086	.293**	(.307)	(1.009)
(.867)	(.147)		
Percentage change in total corporate income tax between 2001 and 2010		-.068	.240
.103	.025	(.476) (1.344)	(1.565) (.228)
Unemployment rate within state		.227 -.208 (.013) (.036)	.027 -.097 (.042) (.006)
Federal defense expenditures per capita within state		.174 -.100 (.000) (.000)	.186 -.112 (.000) (.000)
<i>Demographic Variables</i>			
Percent of state population 18-24 years old		-.163 -.051 (.014) (.041)	-.009 .643*** (.047) (.007)
Percent of state population age 65 and older		-.041	
.149		-.283	
(.024)		.210 (.007) (.003)	(.020)
Percent of the mass public conservative		-.259	-
.095		-.333 -.008 (.003)	
(.011)		(.006) (.002)	
Percent of population with high school degree or higher		.021	-
.459		-.043 -.026	

	(.004)	
(.014)		(.012)
	(.002)	
Constant	-.037	.656
		.833
		-
.399		
R Square	.239	.247
		.153
		.426

*sig at .10, ** sig at .05, *** sig at .01

Beta Coefficients

Standard error in parentheses

Regressions for Manufacturing Subsets

	Miscellaneous Manufacturing	Textile
<i>Economic Variables</i>		
Percentage change in total sales tax between 2001 and 2010	-.173 (.314) (.074) (.247)	-.016 (.286)
Percentage change in total individual income tax between 2001 and 2010	-.080 (.504)	.122 (.459)
-.116 -.080		
(.119) (.397)		
Percentage change in total corporate income tax between 2001 and 2010	-.100 (.781) (.184)	-.109 (.711) (.615)
-.361* -.487**		
Unemployment rate within state	-.434** -.017 (.021) (.005)	-.396* -.127 (.019) (.017)
Federal defense expenditures per capita within state	-.351** -.095 (.000) (.000)	-.110 -.122 (.000) (.000)
<i>Demographic Variables</i>		
Percent of state population 18-24 years old	-.339* .435** (.024) (.006)	.283 .159 (.021) (.019)

Percent of state population age 65 and older .005		-0.382*		-
		.294		
		.254		
		(.012)		
(.011)			(.003)	
		(.009)		
Percent of the mass public conservative .121		-0.158		-
			-0.348	
		.010		
		(.005)		
(.005)			(.001)	
		(.004)		
Percent of population with high school degree or higher .005		-0.006		
			-0.026	
		-0.327		
		(.007)		
(.007)			(.002)	
		(.006)		
Constant		1.210		-
.175				-
.183				
		.026		
R Square		.442		.287
				.378
				.329

*sig at .10, ** sig at .05, *** sig at .01

Beta Coefficients

Standard error in parentheses

Regressions for Manufacturing Subsets

Economic Variables

		Printing	Chemical
Percentage change in total sales tax between 2001 and 2010		.033	.117
		(.078)	(.975)
		(.000)	
		(.000)	
Percentage change in total individual income tax between 2001 and 2010		.137	.039
.008	-.061		
		(.245)	(1.565)
(.000)	(.000)		
Percentage change in total corporate income tax between 2001 and 2010		-.169	-.320
-.080	.137		

	(.194)	(2.427)
	(.000)	(.000)
Unemployment rate within state	.045	-.115
	-.188	-.085
	(.005)	(.066)
	(.006)	(.006)
Federal defense expenditures per capita within state	.059	-.117
	.034	.086
	(.000)	(.000)
	(.000)	(.000)
<i>Demographic Variables</i>		
Percent of state population 18-24 years old	.295*	.092
	.287	.599***
	(.006)	(.073)
	(.008)	(.007)
Percent of state population age 65 and older	.428**	
.039		.157
	.204	
	(.003)	
(.037)		(.004)
	(.004)	
Percent of the mass public conservative	.174	
.311		.274
	.003	
	(.001)	
(.016)		(.002)
	(.002)	
Percent of population with high school degree or higher	.117	-
.404		.092
	-.308	
	(.002)	
(.022)		(.002)
	(.002)	
Constant	-.290	
	1.276	
	-.216	
	-.281	
R Square	.378	.251
		.180
		.457

*sig at .10, ** sig at .05, *** sig at .01

Beta Coefficients

Standard error in parentheses

Regressions for Manufacturing Subsets

Mineral

Primary Metal
Food Beverage

Fabricated

Economic Variables

Percentage change in total sales tax between 2001 and 2010			-.153		-.204
			(.000)		(.000)
			(.000)		
			(.000)		
Percentage change in total individual income tax between 2001 and 2010			-.018		-.070
-.272		-.019			
			(.000)		(.000)
Percentage change in total corporate income tax between 2001 and 2010			.052		.154
.142		-.002			
			(.000)		(.000)
			(.000)		(.000)
Unemployment rate within state			-.020		-.048
			.157		.004
			(.020)		(.013)
			(.028)		(.125)
Federal defense expenditures per capita within state			.064		.211
			-.061		-.026
			(.000)		(.000)
			(.000)		(.000)

Demographic Variables

Percent of state population 18-24 years old			.528***		.036
			.540***		.280
			(.024)		(.016)
			(.034)		(.153)
Percent of state population age 65 and older			.022		
.232				.199	
			-.124		
			(.012)		
				(.017)	
			(.076)		
Percent of the mass public conservative			-.146		
.340				-.124	
			.285		
			(.005)		
				(.008)	
			(.034)		
Percent of population with high school degree or higher			-.235		-
.192				.226	
			.138		

	(.007)	
(.005)		(.010)
	(.046)	
Constant	-.848	-
.385		-
1.776		
	-.3095	
R Square	.523	.308
		.342
		.171

*sig at .10, ** sig at .05, *** sig at .01

Beta Coefficients

Standard error in parentheses

Regressions for Manufacturing Subsets

Economic Variables

	Computer & Electronic	Plastic & Rubber	Machin
Percentage change in total sales tax between 2001 & 2010	-.121 (5.898)	.013 (.159)	.037 (.504)
Percentage change in total individual income tax between 2001 & 2010	-.235 (9.468)	.191 (.255)	.196 (.809)
Percentage change in total corporate income tax between 2001 & 2010	.242 (14.682)	.018 (.395)	-.21 (1.23)
Unemployment rate within state	.54*** (.398)	-.345 (.011)	-.44 (.034)
Federal defense expenditures per capita within state	-.089 (.000)	-.098 (.000)	-.28 (.000)

Demographic Variables

Percent of state population 18-24 years old	-.053 (.444)	.303 (.012)	.277 (.033)
Percent of state population age 65 and older	.084 (.223)	.100 (.006)	.158 (.019)
Percent of the mass public conservative	-.389 (.099)	(.001)	.403 (.000)
Percent of population with high school degree or higher	-.253 (-.253)	-.258 (.004)	-.20 (.012)
Constant	3.468	-.046	-.330
R Square	.398	.266	.353

*sig at .10, ** sig at .05, *** sig at .01

Beta Coefficients

Standard Error in Parentheses

Correlations for Manufacturing Subsets

Rubber

Computer & Electronic
Electronic Equipment
Product

Plastic &
Machinery

Economic Variables

Percentage change in total sales tax between 2001 and 2010

.111

-.159

Percentage change in total individual income tax between 2001 and 2010

-.278*

.052

-.057

.191

Percentage change in total corporate income tax between 2001 and 2010

.144

.010

-.204

-.026

Unemployment rate within state

.306**

-.284**

.088

-.257*

Federal defense expenditures per capita within state

-.175

.023

.147

-.144

Demographic Variables

Percent of state population 18-24 years old

-.123

.211

.017

.376***

Percent of state population age 65 and older

-.049

-.192

.044

.097

Percent of the mass public conservative

-.225

.029

-

.072

.317**

Percent of population with high school degree or higher

-.094

-.043

.130

-.098

*sig at .10, ** sig at .05, *** sig at .01

Coefficients

Correlations for Manufacturing Subsets	Motor Vehicle Body Trailer and Parts	Furniture
<i>Economic Variables</i>		
Percentage change in total sales tax between 2001 and 2010	-.224	-.120
Percentage change in total individual income tax between 2001 and 2010	.142	.217
.040 -.019		
Percentage change in total corporate income tax between 2001 and 2010	.168	-.087
.011 -.033		
Unemployment rate within state	-.141 .001	-.089 -.206
Federal defense expenditures per capita within state	.193 -.022	-.029 -.230
<i>Demographic Variables</i>		
Percent of state population 18-24 years old	.074 -.018	.379*** -.158
Percent of state population age 65 and older	-.030 -.101	-
.017	-0.072	

Percent of the mass public conservative .040	.046 -.094	.053	-
Percent of population with high school degree or higher .042	-.123 -.027	-.013	

*sig at .10, ** sig at .05, *** sig at .01

Coefficients

Correlations for Manufacturing Subsets

Economic Variables

	Apparel Leather & Applied Products	Textile
Percentage change in total sales tax between 2001 and 2010	-.125	-.133
Percentage change in total individual income tax between 2001 and 2010 .026 .195	-.097	.070
Percentage change in total corporate income tax between 2001 and 2010 -.275* -.190	-.302**	-.109
Unemployment rate within state	.038 .138	-.240* .013
Federal defense expenditures per capita within state	-.080 -.045	-.010 -.097

Demographic Variables

Percent of state population 18-24 years old	.262* .192	.132 .319**
---	---------------	----------------

Percent of state population age 65 and older .012	.038 -.045 .255*	
Percent of the mass public conservative .157	-.136 .092 .396***	-
Percent of population with high school degree or higher .124	-.002 -.312** -.131	

*sig at .10, ** sig at .05, *** sig at .01

Coefficients

Correlations for Manufacturing Subsets	Chemical	Wood Product
<i>Economic Variables</i>		
Percentage change in total sales tax between 2001 and 2010	.011	-.007
Percentage change in total individual income tax between 2001 and 2010 -.082 -.081	.066	-.009
Percentage change in total corporate income tax between 2001 and 2010 -.010 .015	-.179	.001
Unemployment rate within state	.172 .088	-.198 -.071
Federal defense expenditures per capita within state	.027 .216	.052 .191

Demographic Variables

Percent of state population 18-24 years old	.231 .449***		.144 .523***
Percent of state population age 65 and older	-.156	-.134	
.147	-.336		
Percent of the mass public conservative	.241*		.216
.042	.087**		
Percent of population with high school degree or higher	-.300**	-.074	
.139	-.229		

*sig at .10, ** sig at .05, *** sig at .01

Coefficients

Correlations for Manufacturing Subsets

	Fabricated Mineral	Food Beverage &
Tobacco		
<i>Economic Variables</i>		
Percentage change in total sales tax between 2001 and 2010	-.144	-.165
Percentage change in total individual income tax between 2001 and 2010	-.140	-.143
-.098		
Percentage change in total corporate income tax between 2001 and 2010	.006	-.088
-.075		

Unemployment rate within state	-.138 .104	.032
Federal defense expenditures per capita within state	.225 -.001	-.083
<i>Demographic Variables</i>		
Percent of state population 18-24 years old	.260* .315**	.318**
Percent of state population age 65 and older .100	-.033 -.153	
Percent of the mass public conservative .036	.349** .288**	-
Percent of population with high school degree or higher .157	-.177 -.195	

*sig at .10, ** sig at .05, *** sig at .01

Coefficients