THE EFFECT OF STATE LEVEL TAXES ON EMPLOYMENT

by

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(Under the Direction of Jeffrey Dorfman)

ABSTRACT

Most of the United States have individual and corporate level taxation and the influence on private employment is largely debated. This paper concentrates on exploring and quantifying the effect of state level taxes and total private, manufacturing, and retail employment using a fixed effects model with socioeconomic variables. Findings suggest that there is a statistically significant negative relationship between the state top marginal individual tax rate and employment in each observed industry. Moreover, property tax rates play a role in location decision making by manufacturing companies. The recovery from the 2007-2009 financial crisis has been marked by weak job growth and this paper evaluates the role of state taxation in creating new jobs.

INDEX WORDS: Individual income tax, corporate income tax, property tax, employment, retail industry, manufacturing industry.

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DEDICATION

This work is dedicated to my parents, and Robert & Jean Fowler for love and endless support in every moment of need.

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CHAPTER 1

INTRODUCTION

Employment remains a major indicator of an economy for both policy makers and households. While in an expansionary economy we may pay less attention to taxes, in recessionary periods the level of taxation raises more concerns from the public. Tax levels can serve as a major obstacle to job creation and as an effective tool in fighting unemployment and creating economic growth. The current recovery has been labeled as jobless by some economists and this research is concentrated on revealing the role of state tax levels in the job creation process.

While some states like Ohio have been decreasing individual and corporate income tax rates to stimulate economic activity, other states, such as Illinois, have been increasing state taxes in order to balance their budgets in the aftermath of 2007-2009 recession. A few states have no individual or corporate income taxes imposed on their citizens and businesses. Thus, given the variation on state tax policies, examining the impact of these policies on employment seems worthwhile.

There are several ways governments can affect the businesses' decision, among them are location incentives, capital expenditure tax exemptions and federal and state level tax reductions. However, the main focus of this paper is to evaluate the impact of state level individual, corporate, and property taxes on job creation for the period of 2001 to 2012. Local and state specific business targeted incentives are very difficult to account for, as well as to separate from other local amenities. While such incentives may play a large role, addressing that question is left to other studies.

The general common sense is that companies wish to locate and create jobs in states with lower tax burden in order to maximize their profits; however, some of those states might have a lack of qualified human capital or public amenities. Some previous studies (Ljungqvist, 2014; Reed, 2008) have found a negative relationship between employment, income, and state taxes, while others find no significant relationship (Bloom, 1955; Lynch, 2004). The issue of spending the tax revenues is another open question. While some of the funds may be used for education and infrastructure expenditures, a large proportion may be used for transfer payments to the state citizens thereby causing distortions in the economy (Helms, 1985).

In our results we find a significantly negative relationship between state individual income tax rates and private sector job creation. While we do not find a significant impact for corporate income tax rates, property taxes may play a role in manufacturing job creation. We also find that a state's financial commitment to higher education plays a significant role in employment in various industries.

The results of this research adds to the tax and employment literature and can serve as a policy guide to create more jobs at a state level. The remainder of the paper is organized as follows: section 1 overviews related literature and model specifications. The next section describes the data employed and empirical results. Finally, the paper ends with some concluding remarks.

CHAPTER 2

LITERATURE REVIEW

The wide array of literature on the effects of the tax system structure, collection, and rates on various economic and employment indicators can be classified into three major segments. First, and also the topic of this research paper, how state and local tax policies impact on the economy. Second, studies of the growth impacts of the U.S. federal tax rates and revenue composition along with similar research using international data. Lastly, other studies that include local tax incentives for business attraction, implementation of tax cuts, and the structure of tax collections.

Econometric research on the effect of local and state taxes on economic growth has produced conflicting results, but more recent evidence using improved data and techniques indicates that taxes play a significant role in economic development. Multiple studies reveal that tax and economic incentives have a positive effect on local economic development. However, this is a complex topic which has many unique approaches to study and yields a series of questions and problems. Bartik (1992) has reviewed 84 econometric studies on this topic since 1979 and estimated that the long run business development elasticity with respect to local and state taxes is -0.1 to -0.6 across state and metropolitan areas and -1 to -3 within metropolitan areas. In the process of studying previous papers, Bartik found five major problems in analyzing this topic.

Firstly, most studies use aggregate data to model complex individual firm decisions on expansion, contraction, and relocation which raises the question of the applicability of this data as proxy.

Secondly, current economic conditions are the results of previous activities and many studies fail to include past economic indicators in the models. Next, it is hard to perfectly measure the major economic variables: wages, public services and tax rates are the most problematic. Wages are usually measured at the average but that does not control for the labor quality or the full distribution of wages. Perhaps indicators of education and experience can serve as additional variables, but that might overcomplicate most models. Moreover, public services must also be included in models to account for local attractiveness for businesses. When deciding to expand existing business or locate a new business companies pay attention not only to tax burdens but also to public amenities. In addition, data on local and state taxes is weak and hard to compare among jurisdictions and industries. Many studies use average tax rates instead of marginal rates, and often use tax measures that are not specific to a particular business sector.

The fourth problem researchers face is the impossibility of including each aspect of location or expansion decision making by firms. Estimation of regressions with missing variables can lead to biased parameters. To overcome this issue, Bartik suggests using a fixed effects model including regional dummy variables or using the first difference of all variables from either the previous period or the sample mean.

The final problem is a feedback between control and growth variables or the use of endogenous independent variables. For instance, while lower wages promote growth, higher economic growth leads to higher wages, complicating the statistical estimation of the relationship between the two variables. Instrumental variables that control for endogenous relationships may allow researchers to correct this problem.

Most literature tries to find a statistical relationship between the economic indicators and taxation rather than the nature of the growth (Lynch, 2004). Analysis of literature before the 1970's

suggests little support for the idea that tax cuts and other fiscal incentives are the best ways to encourage employment and economic growth, especially when they happen at the expense of the public investment (Lynch, 2004). Most studies used income, employment rate, investment, plant expansions, relocations and births as dependent variables. Studies before 1970 emphasized manufacturing employment rather than services and treated regions on a state level rather than county; few studies included income as a variable. Income levels serve as an indicator of less regional variability because it includes capital gains, interest income and other incomes that might come from different regions (Wasylenko, 1997). In more recent literature, investment serves as an important variable due to its better availability and greater impact on local economies in the 1980-1990's despite the lower share of manufacturing employment. Investments are directly linked to employment, which serves as the most indicative measure of economic prosperity in a region. Employment or the unemployment rate remain the lead indicator for assessing fiscal policy in the region. The return on capital is implicitly assumed to be roughly the same in different states because if there is a significant difference then capital is assumed to relocate.

The broad literature distinguishes two research fields in the topic of taxation and economic development: local and state fiscal policy including location tax incentives and federal fiscal policy.

Studies which concentrate on state and local tax policies largely agree with the idea that higher tax rates hurt economic indicators and the attraction of new firms. Nevertheless some authors find little evidence that local tax cuts significantly affect employment, investment and economic growth. Research focused on the macroeconomic impact of personal income and corporate taxes find a negative relationship between tax rates and GDP growth. However, the

literature before the 1970's suggests little to no empirical evidence of correlation between national fiscal policy and economic growth.

State and Local Tax Studies

Helms (1985) researched the effect of local and state taxes on economic growth. Using cross sectional and time series data from 1965-1979 across 48 states, it was found that higher taxes significantly retard economic growth when the taxes are collected primarily to be used for transfer payments. However when the collected funds are used to finance public services such as education, highways and safety, it may counterbalance the negative effect of higher taxes. Helms claims that the federal government does a better job of income redistribution and if states use taxes for transfer payments it hurts the local economy. In addition, labor force characteristics were included in the study by controlling for unionization level, wage rates, and population density. Helms used the equation of total state and local government revenues and expenses defining surplus or deficit to estimate the effect of each treated value on the economic indicators. Using least squares while treating time and state effects as constant, Helms found that raising property tax by 0.1% of personal income equivalent to a 2.33% increase in mean property tax revenues to increase transfer payments by 5.32% leads to a first year decrease in personal income of 0.121% and a corresponding 1.483% decrease in the long run. User fees and other taxes have smaller effects; however, running a budget deficit has a greater negative impact.

Bartik (1992) reviewed the literature on the effects of state and local taxes on economic development, and found statistically significant negative effects on the economic growth of a state or a metropolitan area. Bartik's findings suggest local and state business tax cuts of $2,000-$11,000 in lower revenue per year are necessary to gain each additional job. While conventional

wisdom was that property taxes have little significance on businesses because it is a small share of expenses, small suburbs have powerful property tax cut effects that translate into business growth. Although business tax reductions in the suburbs financed at the expense of education or infrastructure might destroy existing jobs, cutting business property taxes may raise revenue, if the tax cut is not matched by rival regions. Evidence from cities appear to be less clear, with results mixed. The approach of finding the cost of creating a job serves as a guide to policymakers; however, is not an ultimate tool in deciding local fiscal policy.

Wasylenko (1997) used aggregate data on economic activity including income, investment, employment and gross state product. Micro elements of employment growth such as firm births, deaths, and relocations were used to obtain better estimates of separate elasticities for each factor. The results suggest that taxes have no substantial economic impact between states partly because the regions and states have similar tax policies eliminating the tax effect. However, Wasylenko estimates a negative tax elasticity that is significantly different from zero, implying higher tax states lose economic activity to mid or low tax states. Reviewed literature suggests that taxes have a small but statistically significant effect on interstate location decisions. The effect of a particular state's tax rates depends not only on the elasticity, but also on the extent to which the state's overall (state and local) tax levels are different from the average rate of competing, usually neighboring, states. A large deviation from the average tax level, multiplied by the tax elasticity, will yield a large location, employment, or investment effect.

Reed (2008) estimated the relationship between taxes and income growth using data from 1970–1999 across the 48 continental U.S. states. The study employs a generalized Cobb–Douglas production function that includes the Solow model and the augmented, human capital model of Mankiw, Romer, and Weil (1992) as special cases. Results indicate that taxes that are funding

general expenditures are associated with a significant negative effect on income growth. This finding is generally robust across alternative variable specifications, alternative estimation procedures, different groupings of the data into 5 year periods, and Bureau of Economic Analysis (BEA) regions, though state specific estimates vary widely.

Prillaman and Meier (2014) used panel data for all 50 U.S. states from 1977 to 2005 and researched the impact of state business taxes on the overall economy of the state, particularly looking at their effect on economic development and business growth. The study employed the generalized method of moments and found that state business tax cuts have little to no positive impact on gross state product, job creation, personal income, poverty rates, or business establishments. Although a policy of tax cuts may bring in businesses, these businesses do not generate growth. Prillaman and Meier's (2014) results show that lowering business taxes may be harmful to the state economy. By decreasing state revenues, the state's funds to provide public services are limited which is a necessary component of a strong business climate. The most conservative interpretation of these results is that decreasing business taxes will not generate direct economic growth. In contrast, nonbusiness taxation has a negative effect which is in line with economic theory. A one percentage point of GSP (gross state product) decrease in nonbusiness tax receipts is expected to increase the growth rate of GSP by 5.09%. However, removing extreme values, the analysis provides a more conservative effect estimate (4.55%). This supports the expectation of a negative relationship between the nonbusiness tax burden and statewide economic growth.

Ljungqvist (2014) studied the effect of state corporate taxes on employment and income across the nation with a sample of 140 tax increases and 131 tax cuts in 45 states, affecting 3,390 counties. A differences approach is used by comparing not neighboring states but contiguous

counties located on either side of a state border. This method strives to eliminate the effects of unobserved local variation in economic conditions that might correlate with the tax change. The results show that generally higher state corporate taxes have a negative effect on employment and income in treated counties. A one percentage point increase in the top marginal corporate tax rate reduces employment by 0.3-0.5% and income by 0.3-0.6% in relation to neighbor counties in the other state.

The above mentioned studies of tax effects on U.S. state economies found predominantly negative effects. Researchers concentrate on business and nonbusiness tax elasticities as well as property taxes and tax incentives to quantify the effect on GSP and job creation. Bania, et al. (2007) find the incremental effect of taxes directed towards public investments may add growth in the short term but reduce long term GDP. Tomljanovich (2004) suggests that higher tax rates have a negative effect on short run growth, but not on long run growth. Chernick (1997) investigated state level data and concluded that progressive income taxes hurt GSP growth. Notably, Helms (1985) found that tax revenues that are used to finance transfer payments retard growth. Other studies find that fiscal policy does not have a significant effect on economic indicators. Bloom (1955) found no negative impact on growth from state and local taxes on manufacturing employment and capital expenditures. On the contrary, he reported a small positive correlation between taxes and manufacturing employment growth: higher taxes were consistent with a more rapid expansion in manufacturing jobs.

U.S. Federal Tax Rates and International Studies

Papers that have investigated federal taxes, including both personal income and corporate income taxes, show mostly negative relationships. For example, Mertens and Ravn (2012)

researched U.S. Post-WWII exogenous changes in personal and corporate income taxes and found a negative relationship between real GDP and tax levels. A 1 percentage point cut in the average personal income tax rate raises real GDP per capita by 1.4% in the first quarter and by 1.8% annualized after three quarters. A one percentage point cut in the average corporate income tax rate raises real GDP per capita by 0.4% in the first quarter and by 0.6% annualized after one year.

Cashin (1995) developed an endogenous growth model of the influence of public investment, public transfers, and distortionary taxation on the rate of economic growth. The model was tested with cross sectional and pooled data from 23 countries over the period 1971-1988. It includes both public and private physical capital rather than just contemporaneous flows of government spending as an input to private production. Public transfer payments are considered productive inputs in private production functions. Cashin found that increased government spending on things that enter private production as productive public inputs enhances economic growth. For example, federal public investment and transfer payments can lead to private investment and economic growth.

Engen and Skinner (1996) concluded that tax policy has a modest impact on economic growth by studying the macroeconomic impact of different tax rates along with human capital, investment and technological growth. They suggest that major tax reform which reduces marginal tax rates by 5 percentage points and the average tax rate by 2.5 percentage points will lead to additional long term growth rate of 0.2 and 0.3 percentage points, respectively. This modest additional growth due to tax cuts lead to significant improvement in long term living standards. For example, accumulated over 36 years from 1960-1996, it translates into 7.5% higher GDP for the nation or $500 billion annually.

Heitger (1993) analyzed the welfare efficiency relationships of taxation and tested the relationship between fiscal policy and economic output for OECD countries. After WWII, Western European countries along with Japan were able to catch up with the U.S. in terms of GDP per capita from around 40% to 85% by 1990. Japan had the lowest tax burden of 18% of GDP in the 1960's when it made the biggest leap in economic development after which taxes were rising. Heitger found a negative effect of tax burdens on developed countries' economic efficiency and further development.

Arnold, et al. (2011) studied 21 OECD countries from 1971 to 2004 and find that corporate taxes are the most harmful followed by personal income, consumption and property taxes. Moreover, progressivity of personal income tax deteriorates growth, a 1% shift of tax revenues from personal and corporate income taxes to consumption and property taxes increases GDP per capita by 0.25%-1% in the long run. In addition, findings suggest that corporate taxes reduce investment and productivity growth and raising the top marginal personal income tax rate reduces productivity growth. Ferede and Dahlby (2012) studied the Canadian provinces from 1977-2006 and came to the same qualitative conclusion but on a different scale: they estimate that reducing the corporate income tax by 1 percentage point leads to a 0.1-0.2% annual growth increase. Lee and Gordon (2005) studied 70 countries in the period of 1980-1997 and came to the same exact result as Ferede and Dahlby.

Canova and Pappa (2011) factored in both fiscal and monetary responses to business cycles in the recent period and estimated its effect on output growth in the U.S., UK and EU. Their results suggest that fiscal policy can be an effective countercyclical tool and that the output multipliers it generates may be significantly larger than one. These results are conditional on monetary policy that facilitates fiscal expansion; expectations about future output growth and inflation should not

be affected; and structural relationships, such as the sensitivity of consumption to output or the real interest rate, should be invariant to the policy change

There are many research papers that concentrate on the macroeconomic effects of fiscal policy in both U.S. and OECD countries, especially since WWII. A majority of them find a negative relationship between personal, corporate, and property tax rates and economic growth and investment (Barro and Redlick, 2011, Blanchard and Perrotti, 2002, Padovano and Galli, 2001). In addition, Koester and Kormendi (1989) have studied average tax rates and changes in marginal tax rates from 63 countries and concluded there is a negative relationship with economic growth as well as that progressive personal tax rates reduce GDP growth.

More recent research of Gale and Samwick (2014) investigated the personal income tax and long term economic growth. Tax rate cuts may encourage individuals to save and invest, but if the tax cuts are not financed by immediate spending cuts they will result in an increased federal budget deficit, which in the long-term will reduce national saving and raise interest rates. The net effect is uncertain due to the involvement of many factors and the unpredictability of the effect of tax cuts and financing. However if income taxes are lowered along with federal spending cuts, this will contribute to higher GDP growth.

Romer and Romer (2010) use the narrative record, such as presidential speeches and Congressional reports, to identify the size, timing, and principal motivation for all major postwar tax policy actions. The behavior of output following more exogenous changes in tax legislation indicates that tax increases are highly contractionary. Data includes U.S. tax policy Post-WWII, where they find 104 tax changes of which 65 are exogenous. The effects are strongly significant, highly robust, and much larger than those obtained using broader measures of tax changes.

Specifically, a tax revenue increase of 1% leads to a reduction of output of 3% after two years, mainly through decreased investment.

Implementation, Tax Rate Structure, and Location Based Tax Incentives Studies

Another segment of tax literature studies the effectiveness of the manner of implementation, tax rate structure, and location based tax incentives as a tool for new business attraction. Lynch (2004) reviewed a broad literature and failed to find any significant effect of tax incentives to attract investment and jobs.

House and Shapiro (2006) studied the effect of tax cuts in the 2000's on economic growth and employment, and showed that the gradual implementation of tax cuts is less effective than an immediate one. The 2001 Economic Growth and Tax Relief Reconciliation Act (EGTRRA) included a scheduled sequence of rate reductions in the top four tax brackets that caused a slow recovery from 2001 recession whereas the 2003 Jobs and Growth Tax Relief Reconciliation Act (JGTRRA) with immediate cuts in tax rates on labor and capital resulted in higher economic growth. The authors used a standard business cycle model with a government sector and find that phased-in incentives on labor delay higher production whereas phased-in incentives on capital allow for immediate accumulation of capital to take advantage of lower taxes in the future. The deficit financing of tax cuts and monetary policy in that period were not included in the model and may add to the explanation of roughly half of the GDP growth.

Thompson and Matilla (1959) found that differences in state taxes had no significant influence on annual employment growth in 28 out of the 29 manufacturing industries they examined. Benjamin Bridges (1965) reviewed data on the effect of state and local inducements for

industry. Findings suggest that state and local financial incentives were not a primary consideration in a firm's location decision.

Studies from the 1950's and 1960's have a different view on this topic and find little or a positive correlation between job gains, economic growth and tax rates. On the other hand, Rainey and McNamara (1999) find significant evidence that tax relief incentives can be an important component of an industrial firm choosing a location.

Hungerford (2012) analyzed top marginal income tax rates, the capital gains tax rate, productivity gains, savings and investment, and economic growth. Findings suggest that there is no correlation over the past 65 years, however lower marginal tax rates have allowed higher concentration of income in the top 0.1% of U.S. population. Another Congressional research study by Gravelle and Marples (2014) summarizes the evidence on the relationship between tax rates and economic growth. They conclude that both labor supply and savings and investment are relatively insensitive to tax rates, that the capital gains tax has only a small effect on the cost of capital, and that most expenditures that affect the productivity of labor and capital inputs (research and development, education, or infrastructure) are already tax favored or provided by the government.

Fox and Murray (2004) estimated the impact of the economic and tax incentives on local economies. Most local authorities believe that tax breaks and other incentives serve as an invitation to new firms and more investment. However, the authors do not find a positive net benefit for local economies using panel data and nonrandom stimulation techniques. The database contains large firms that had to make locations decisions in the 1980's and regional economic performance indicators. The findings show that large firms fail to produce significant economic benefit for local communities that offer them tax incentives taking into account state and national economic

conditions and control for time and place fixed effects. Limited or nonexistent marginal tax revenues along with public spending related to amenities development mean that local authorities face new ways of taxing or increasing existing taxes on existing businesses or residents in order to meet target budgets.

Gabe and Kraybill (2002) examined state economic incentives offered to 366 companies in Ohio and how the expansion and growth were occurring. Empirical findings indicate that state incentives had very little or even a negative effect on actual growth and a significant positive effect on planned growth.

Phillips and Goss (1995) provide a meta-analysis of tax incentives to economic indicators as reviewed by Bartik (1992). The authors reach the same conclusion as Bartik that tax incentives have only a modest effect in multi-state or multi-metropolitan areas but a larger impact within metropolitan ones. Meta-analysis treats estimated tax elasticities as observations in a data set, regressing tax elasticities on explanatory variables describing estimation models. Phillips and Goss might have shed light on the elasticity issue, but their models drew criticism for including both statistically significant and insignificant elasticities, as well as outliers so deviant as to be implausible (Buss, 2001).

The manner and structure of taxation plays an important role as well. It is highly unlikely that tax cuts have been self-financing in the aggregate. Feldstein (1995) and Feldstein and Feenberg (1996) find evidence that tax changes for high income taxpayers may be self-financing but not in the population overall. Some shortcomings of the study include the difficulty of measuring the marginal tax appropriately: average tax rate is not the best indicator of business decisions in comparison to marginal rates. Composition of tax revenues play an important role in economic growth rates, increase of tax rates on higher income earners would decrease growth rate

more than proportional tax increase on middle income earners. A broader base of taxpayers along with efficient enforcement will more likely contribute to higher growth.

CHAPTER 3

METHODOLOGY AND DATA

Model Description

The dependent variables of our interest are total private, manufacturing, and retail employment at the state level. The independent variables that will be used to explain job creation can be characterized into social and economic indicators. The social measures include the percentage of people living below the poverty line, violent crime rate, and state appropriations to higher education. The economic measures include a state level housing price index, commercial electricity price, corporate income tax rate, individual income tax rate, average weekly wage, the minimum wage, property tax revenues per capita, and an industrial mix variable.

To estimate the model with the variables mentioned above, we add eleven yearly dummy variables to allow for business cycle effects and forty nine dummy variables for state fixed effects. To avoid perfect collinearity, the state with median population in 2012, Kentucky has its dummy variable omitted. This allows us to find a middle ground in estimating the state fixed effect parameters relative to a middle-of-the-road sized state.

Moreover, in order to allow for natural jobs growth that is a product of population growth, the dependent variable (total, manufacturing, or retail jobs) is divided by the population of each state in the base year 2000. This gives us (after scaling) the amount of working persons per thousand of population in a given state. In order to obtain the effect of change in a certain parameter on total jobs after estimation, we will multiply the parameter by population in a state in 2000 (base year). By dividing all years' dependent variables by the same population, we avoid any issues of

endogeneity from population changes caused by job growth. To clearly establish causality, housing price index, violent crime rate, state higher educational appropriations, poverty rate, and average weekly wage are lagged one period, consistent with previous work since we want to estimate the effect of socio-economic variables on employment, not the reverse (Partridge et al., 2012).

The equation can be represented as

$$y_{it} = \alpha + \beta X_{it} + \gamma_t D_t + \delta_i S_i + \varepsilon_{it}$$

where y_{it} is state *i*'s total private, manufacturing or retail jobs divided by the base year population respectively,

X_{it} is a vector of independent variables,

D_t is a year dummy variable,

S_i is a state dummy variable,

and ε_{it} are stochastic terms for remaining random effects.

We estimate three different fixed effect regressions with identical structure of the independent variables but different dependent jobs variable. First – the aggregate total private jobs, second – total manufacturing jobs and third – total retail jobs in each state.

Data description

The cross sectional time series dataset consists of yearly observations from 2001 to 2012 across 50 states with for a total sample of 600 observations. The dependent variables are the manufacturing, retail and total jobs by state which are estimated in separate models. The jobs data are for private firms only, not seasonally adjusted, and measure statewide employment in thousands; these data are provided by Current Employment Statistics (CES) of Bureau of Labor Statistics. There are eleven independent variables used in the model including: the violent crime

rate, poverty rate, state appropriations to higher education, a housing price index, commercial electricity price, corporate income tax rate, individual income tax rate, average weekly wage, minimum wage, property tax revenues per capita, and industrial mix.

The violent crime rate data were provided by Uniform Crime Reporting Statistics of Federal Bureau of Investigations, U.S. Department of Justice. The numbers are crimes per 100,000 of population in a given year. Poverty rate is the percentage of population falling under the poverty level in a given year in each state obtained from U.S. Census Bureau. Annual state appropriations per full time enrollment (FTE) for higher education are from the State Higher Education Executive Officers Association (SHEEO) and includes funds distributed through the American Recovery and Reinvestment Act of 2009.

The housing price index (HPI) is a broad measure of the movement of single-family house prices which is constructed and updated by the Federal Housing Finance Agency. The HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or refinancings on the same properties. This information is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac. The HPI serves as a timely, accurate indicator of house price trends at state level. Because of the breadth of the sample, it provides more information than is available in other house price indexes. Commercial electricity rates per kilowatt/hour are state-level average prices charged to companies and obtained from the Energy Information Administration of the U.S. Department of Energy.

Corporate and personal income tax rates are the top marginal rates for each state obtained from state tax statutes and compiled by the Tax Foundation. We use the top marginal state income taxes because in most states the top marginal rate is reached at a surprisingly low income levels.

For example, in Georgia only $10,000 in taxable income is required to reach the top marginal rate of 6% for a married couple. Average weekly wages are obtained from Quarterly Census of Employment and Wages of the U.S. Bureau of Labor Statistics. State minimum wage rates are from Wage and Hour Division, U.S. Department of Labor. Any state minimum wage below the federal rate for a given year is adjusted up to match the federal level. State and local property tax revenues per capita are provided by the Bureau of Economic Analysis, U.S. Department of Commerce.

The state-level industrial mix variable was self-derived given the following methodology. State level 2-digit NAICS employment data for each year was obtained from the Statistics of U.S. Businesses of the U.S. Census Bureau. The national growth rate of every 2-digit industry and the percentage of total employment in each industry in each state were calculated. Then the national growth rate for each industry sector was multiplied by that industry's percentage of total state jobs. This was repeated for all sectors and the results were summed up. Normalizing these sums into a weighted average completed the variable construction. The industrial mix number gives us an estimate of how the economy of each state is comprised relative to sectors which are fast growing nationally. A state with a larger positive number indicates that state has more employment in faster growing industries in comparison of national average. For example, California has a predominantly positive index due to a larger share of employment in the fast growing high-technology industry. On the other hand, Alabama has a larger share of slower growing industries and, therefore, has negative index values.

The descriptive statistics are shown in table 1.

CHAPTER 4

EMPIRICAL RESULTS

The three models with different job categories as dependent variables but identical explanatory variables were estimated using generalized least squares to cluster standard errors by state. A diagnostic test for multicollinearity performed on the matrix of independent variables produced a condition number of 37.63 which allows us to safely run the regression without worry about inflated standard errors or unstable coefficients. Cross sectional dependence or contemporaneous correlation is tested by Pesaran's test that is used to see whether the residuals are correlated across states. Cross sectional dependence can lead to biased parameters, however the test yields a result of no cross sectional dependence with p-value of the test 0.4616.

The results of the three regressions show the expected significantly negative signs on the parameter for top state individual marginal tax rates at a 1% significance level in total private jobs creation, and at a 15% significance level in retail and manufacturing regressions. The top state corporate marginal tax rate is insignificant in all regressions and property tax revenue per capita is significant at only a 15% level in the manufacturing jobs model. Goodness of fit indicators in all three regressions show R-squared above 0.94. In order to take a closer look, we discuss the results of each regression separately and find common ground between them.

Total Private Jobs Model Results

The results for total private jobs can be seen in the table 2. All three social indicators and 3 of 8 economic indicators are statistically significant. The first social indicator, violent crime rate

has an unexpected sign, with a significantly positive parameter of 0.0738. To put this coefficient in context, for example, in Alabama, the crime rate has been fluctuating from 427 to 486 (in cases per 100,000 population) from 2000 to 2012. An increase of the violent crime rate by 10 per 100,000 population would be expected to lead to 3,286 more jobs (population in thousands times parameter times postulated change in the variable or 4,452*.0738*10=3,285.6 job gains). This amount constitutes 0.22% of total private jobs in the state. Cook and Zarkin (1985) analyzed the business cycles and crime and found that crime and employment relationship depend on crime type and violent crime rate is not affected by the state of economy.

Next, the poverty rate is significantly negative at a 10% significance level with a parameter of -0.777. The sign and significance align with the logic of less job creation in poor areas and higher in affluent states. For instance, a one percentage point decrease in the California poverty rate from 15.87% to 14.87% is expected to lead to 26,419 job gains which is 0.21% of total private jobs in the state. Furthermore, state educational appropriations for higher education per full time student is significant at the 1% level with a coefficient of 6.01 and the expected positive sign. As an example, state higher education appropriations in Georgia in 2012 were $6,388 per full time student and a $100 increase would be expected to lead to 4,941 jobs, which is 0.15% of total private jobs in the state.

The housing price index is another positive significant variable with a parameter of 0.086. This suggests that higher housing prices are generally associated with faster job gains in the state. One of the fastest growing housing markets in the nation was Nevada, a 10 point increase in the housing price index in is expected to lead to 1,740 jobs or 0.175% of total private jobs in the state.

One of the most important variables from the point of view of this research is the state top individual marginal tax rate. The parameter of -3.83 is highly significant and negative as expected.

This implies that a one percentage point decrease from 6 to 5 percent in Georgia would be expected to lead to 31,509 more jobs in the state or 0.96% of jobs as of 2012. On the other hand, a one percentage point decrease in the tax rate in Arkansas from 7 to 6 percent would be expected to lead to 10,263 more jobs or 1.07% of total private jobs. Due to the fact that the tax rates are different along with the population, the estimated tax rate elasticities are also going to be different. For Georgia, it is 0.96/-16.67= -0.058, and for Arkansas 1.07/-14.29= -0.075, which is near the lower boundary of Bartik's (1992) estimation of tax elasticities who suggested a boundary of a -0.1 in his research. However not every state has the tax rate elasticity because some states do not have state income tax. The average and weighted average tax rate elasticites are presented in table 5. States that do not have individual tax rate are omitted in the table. Change in the tax rate is percentage change from current level. Percent of total jobs is the expected job gains divided by current total private jobs and elasticity is calculated as expected job gains divided by change in tax rate

The average weekly wage in a state is positively significant at the 5% level with a parameter of 0.178. The sign of the coefficient is expected to be positive and suggests that states with higher wages generally attract more jobs. In the case of Connecticut, which is one of the highest earning states at $1,214 a week, a $10 increase is expected to lead to 6,082 jobs, or 0.43% of total private jobs in the state.

The commercial electricity price per kw/h is not statistically significant, nonetheless the sign is negative as expected, because generally higher energy costs hurt business growth. The state marginal corporate income tax rate, property tax revenues per capita, and minimum wage coefficients are also insignificant with negative signs as expected. The industrial mix parameter is positive however insignificant in the total private job gains model.

Retail Jobs Growth Model Results

The results of the retail job gains regression contain fewer significant variables, nevertheless goodness of fit still remains strong, R-squared = 0.979. There is only one variable significant at the 1% level (state higher educational appropriations), one at the 10% level (industrial mix), and 3 at the 15% level (housing price index, individual income tax rate, and average weekly wage). The results of the model are shown in table 3.

Firstly, state appropriations to higher education per full time student show a positive and statistically significant result with a coefficient of 0.7. This estimate suggests that for Georgia, a $100 increase per full time enrollment in state higher education appropriations is expected to lead to 580 jobs in retail sector. This estimate of retail jobs suggests that of 4,941 jobs created in total, only 580 jobs or 11.73% of them will be in retail industry, whereas the total retail industry share of state employment is 13.61%

However, the industrial mix parameter is negative and significant at 10% level. Perhaps, this coefficient implies that states with slower growing industries have the capacity to create more retail industry jobs. For example, Alabama had a predominantly negative industrial mix coefficient throughout the 2000's, ranging from -0.34 to 0.01. In this case, a modest 0.05 relative increase in the industrial mix towards higher growth industries is expected to lead to 73 lost jobs in retail for the whole state, or -0.033% of retail jobs, which is not economically significant.

Furthermore, the housing price index is positive and significant at the 15% level with a parameter of 0.01. This aligns with the idea that generally in a good economy with rising housing prices, the retail industry also creates more jobs. As a result, a modest 10 point increase in the housing price index in New York is expected to lead to 2,012 jobs created or 0.22% of total retail sector jobs. In addition, the New York state top marginal individual income tax rate parameter is

negative and significant at the 15% level. A one percentage point decrease in tax rate from 8.82 to 7.82 percent is expected to lead to 4,500 new jobs in retail created or 0.49% of total retail jobs. The tax elasticity can be calculated as follows:

$$\frac{0.49\%}{\frac{7.82 - 8.82}{8.82} * 100\%} = -0.043$$

which is relatively less than total jobs tax elasticity.

Similarly, the average weekly wage variable parameter is positive as in the total jobs model; however, it is statistically significant only at the 15% level. We would expect more shopping expenditures with higher wages to translate into higher employment in retail sector. A modest $20 increase of weekly wage in Maine from $765 to $785 is expected to lead to 290 jobs or 0.36% of total retail jobs.

Manufacturing Jobs Growth Model Results

The results of the manufacturing employment model consist of one variable that is statistically significant at the 1% level (state higher education appropriations), 3 coefficients significant at the 5% significance level (housing price index, average weekly wage, industrial mix), and 3 coefficients significant at the 15% significance level (crime rate, individual income tax rate, property tax revenue per capita). The results are outlined in table 4.

As in the previous two models described above, state appropriations to higher education play a significant role in manufacturing jobs creation as well. The parameter value is 1.04, and highly significant with a t-value of 2.82. We can interpret this number using Ohio as an example. If Ohio increased higher education state appropriations by $100 from $4,340 to $4,440 per student, it would be expected to lead to 1,180 new manufacturing jobs. This would constitute 0.18% of total manufacturing jobs in the state. On the other hand, in a state with a smaller manufacturing

industry like Colorado, the same $100 increase in educational appropriations from $5,916 to $6,016 per student is expected to lead to 450 new manufacturing jobs; however, this comprises a larger percentage (0.34%) of total state manufacturing jobs.

In addition, the housing price index is statistically significant with a coefficient of 0.028. The positive parameter suggests that with higher housing prices, which generally occurs in an expanding economy, states experience growth in manufacturing jobs as well. For example, a 10 point increase in the index in Illinois is expected to lead to 3,522 jobs in manufacturing, which is 0.6% of total manufacturing industry jobs. Next, average weekly wage is also statistically significant at the 5% level and positive as expected. As in the other two models, we can assume that an increase in average weekly wages is usually observed in an expanding economy and associated with employment gains. To show the magnitude of the coefficient, we consider a case of a modest $20 increase in weekly wages in Iowa, from $765 to $785. This development would be expected to lead to 2,200 new jobs in manufacturing which is 1.05% of total jobs in manufacturing industry in Iowa.

Furthermore, the industrial mix coefficient is significant and negative. Manufacturing industry has been slow growing in the 2000's, even losing jobs in certain states. Perhaps manufacturing companies are going to slow growing areas to get lower wages, cheaper land, and cheaper utilities. In the case of Arkansas, where the industrial mix was negative throughout the 2000's, a modest 0.1 point decrease in the industrial mix from -0.1 to -0.2, which means higher employment in slower growing industries such as utilities or agriculture, would be expected to lead to 433 more manufacturing jobs or 0.28% of state employment in the sector.

The crime rate is positively associated with manufacturing employment gains. The parameter is positive and statistically significant, however the scale is quite small. For an increase

in the violent crime rate of 10 cases per 100,000 population, Nebraska would be expected to experience a gain of 226 manufacturing jobs, which represents 0.24% of total employment in the sector. The positive linkage between employment and crime can be considered as not in the line with common sense, however Cook and Zarkin (1985) find that most crime and employment relationship studies find weak results and depend on type of crime. While property crime like burglary and theft increase during economic downturns, violent crime rate did not depend systematically on business cycle.

Next, the top individual income tax rate is negative and statistically significant for manufacturing job gains at a 15% level. For example, a one percentage point decrease in the top marginal tax rate in Idaho from 7.8 to 6.8 percent would be expected to produce 733 new jobs in manufacturing which is 1.3% of total manufacturing jobs. In terms of tax elasticity, this change can be calculated as

$$\frac{1.3\%}{\frac{6.8-7.8}{7.8} * 100\%} = -0.1$$

This tax rate elasticity is applicable only to Idaho and will change when calculated for other states due to variations in population and manufacturing employment.

Property tax revenues per capita is another important indicator of manufacturing employment, and this variable has a negative coefficient that is significant at the 15% level. A modest state property tax decrease of $2 per capita is expected to lead to 983 new manufacturing jobs in Georgia, which would constitute 0.28% of total state manufacturing employment.

CHAPTER 5

CONCLUDING REMARKS

Summary

To summarize the results of the three models presented, most of the statistically significant variables have the expected signs and reasonable magnitudes. Recent literature of the tax effects on employment and economic growth largely agree that higher marginal tax rates negatively impact job and GDP growth (Helms, 1985; Wasylenko, 1997; Reed, 2008). The results of our fixed effects regression support the previous studies and show that while the state corporate income tax rate is insignificant, the individual marginal income tax rate is significant at the 1% level in the total jobs regression. Property tax revenues play some role in creating manufacturing jobs as companies somewhat base their location decision on local tax rates; however, property taxes have no significant effect in retail and total employment.

In addition, state appropriations for higher education is an important indicator for retail, manufacturing, and total employment. Spending more money for higher education creates more manufacturing than retail jobs, with parameters 1.038 and 0.7 respectively, whereas the coefficient for total jobs is 6.01. In terms of elasticities, a one percent increase in state spending towards higher education is expected to lead to 0.09% more total private jobs, 0.19% more manufacturing jobs, and 0.08% more retail jobs. Moreover, the poverty rate affects aggregate job growth, but the corresponding parameters are not statistically significant in the retail or manufacturing jobs.

An important indicator of a state's economy is the housing market. Generally rising home prices suggest an expanding economy and job growth. The housing price index is a significant

coefficient in all three models, however at only the 15% level in the retail employment model. Another variable that is associated with growing GDP is the average weekly wage that is also significant in all regressions, though only at the 15% level in the retail jobs model. The minimum wage level does not seem to play significant role in any model, though the signs are negative in the total and manufacturing jobs models (and positive in the retail jobs model). Though we find positive relationship between violent crime rate and employment, Chirico (1986) finds that at state and county level aggregation, roughly half of all reported studies show a positive and statistically significant relationship between employment and crime, using post-1970 data.

Conclusions

Most of the state and local taxation research is concentrated on gross state product growth, location decision making, change in income, and job creation.

This paper estimates the effect of state level taxes on total private, manufacturing, and retail employment. There are many other socio-economic variables that can affect job creation and taxes should not be studied alone. We include various social indicators of a state such as housing costs, the violent crime rate, and state higher education appropriations. On the economic side, commercial electricity rate, average weekly wage, minimum wage, and an industrial mix index are controlled for in our models.

We used a fixed effects model with social and economic indicators and establish a significantly negative relationship between the top state individual income tax rate and overall job creation. Each state has a different tax rate elasticity. However, we find that the weighted average elasticity is -0.053 and average elasticity is -0.063. That is a decrease of one percent in an individual income tax rate is expected to lead to a 0.053% increase of total private jobs in a given

state by encouraging business activity. Because state tax rates are generally low, a common change might be one percentage point (e.g., from 6 percent to 5 percent), which would translate into a 16.67 percent change in the top tax rate. A tax cut of that magnitude would be expected to lead to a 0.88 percent increase in state employment on average.

Most of the attention about taxes is paid to the federal rates, however state and local taxation can play a significant role in jobs creation as well as economic growth (Prillaman and Meier, 2014). We find that state top individual marginal income tax rate plays a significant role, however there is no significant state corporate income tax link to job growth. Property taxes play a role in location decision making by manufacturing companies.

This topic is particularly important in the aftermath of the Great Recession, as states are competing for increases in employment by offering location decision incentives, investment in infrastructure and amenities. Our results show that tax rates play a crucial role in a state's ability to attract and create jobs. However, the cost benefit analysis of the decision needs to be evaluated as well, because, for example cuts in education may undermine efforts to raise employment. According to the empirical results, possible policy responses of state governments should include increased expenditures into higher education, working to lower their poverty rate, and cuts in individual tax rates.

REFERENCES

Arnold, J., B. Brys, C. Heady, A. Johansson, C. Schwellnus, and L. Vartia. "Tax Policy for Economic Recovery and Growth." The Economic Journal (February 2011): pp. F59-F80.

Bania, N., J.A. Gray, and J.A. Stone. "Growth, Taxes, and Government Expenditures: Growth Hills for U.S. States." National Tax Journal. Vol. 60, No. 2 (June 2007): pp. 193-204.

Barro, R., and C.J. Redlick. "Macroeconomic Effects of Government Purchases and Taxes." Quarterly Journal of Economics. Vol. 126, No. 1 (February 2011): pp. 51-102.

Bartik, T.J. "The Effects of State and Local Taxes on Economic Development: A Review of Recent Research." Economic Development Quarterly. Vol. 6, No. 1 (February 1992): pp. 102-111

Blanchard, O., and R. Perotti. "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output." Quarterly Journal of Economics. Vol. 107, No. 4 (April 2002): pp. 1329-1368.

Bloom, C. "State and Local Tax Differentials." Iowa City, Iowa: Bureau of Business Research, State University of Iowa (1955).

Canova, F., and E. Pappa. "Fiscal Policy, Pricing Frictions and Monetary Accommodation." Economic Policy. Vol. 26 (2011): pp. 555-598.

Cashin, P. A. "Government Spending, Taxes, and Economic Growth". Staff Papers, International Monetary Fund. Vol. 42, No. 2 (June 1995): pp. 237-269.

Chernick, H. "Tax Progressivity and State Economic Performance." Economic Development Quarterly. Vol. 11, No. 3 (August, 1997): pp. 249-67.

Chiricos, T.G. “Rates of Crime and Unemployment: An Analysis of Aggregate Research Evidence.” Social Problems. Vol. 34, No. 2 (April 1987): pp. 187-212.

Cook, P.J., and G.A. Zarkin. “Crime and the Business Cycle.” Journal of Legal Studies. Vol.14, No. 1 (January 1985): pp.115-128.

Engen, E. M., and J. Skinner. “Taxation and Economic Growth.” National Tax Journal. Vol. 49, No. 4 (1996): pp. 617-42.

Feldstein, M. “The Effect of Marginal Tax Rates on Taxable Income: A Panel Study of the 1986 Tax Reform Act.” The Journal of Political Economy. Vol. 103, No. 3 (June 1995): pp. 551-572.

Ferede, E., B. Dahlby. “The Impact of Tax Cuts on Economic Growth: Evidence from the Canadian Provinces.” National Tax Journal. Vol. 65, No 3 (2012): pp. 563-594.

Fox, W.F., and M. N. Murray. “Do Economic Effects Justify the Use of Fiscal Incentives?” Southern Economic Journal. Vol. 71, No. 1 (July 2004): pp. 78-92.

Gabe, T.M., and D.S. Kraybill. “The Effect of State Economic Development Incentives on Employment Growth of Establishments.” Journal of Regional Science. Vol. 42, No. 4 (November 2002): pp. 703-730.

Gale, W. G. and A.A. Samwick. “Effects of Income Tax Changes on Economic Growth.” Brookings Institute (September 2014).

Gravelle, J. G., and D.J. Marples. “Tax Rates and Economic Growth.” Congressional Research Service. Washington, DC (January 2014).

Heitger, B. “Convergence, the “Tax-State” and Economic Dynamics” Review of World Economics. Vol. 129, No. 2 (1993): pp. 254-274.

Helms, J. “The Effect of State and Local Taxes on Economic Growth: A Time Series Cross Section Approach.” The Review of Economics and Statistics. Vol. 67, No. 4 (February 1985): pp. 574-82.

House, C.L., and M. D. Shapiro. “Phased-In Tax Cuts and Economic Activity.” The American Economic Review. Vol. 96, No. 5 (December 2006): pp. 1835-1849.

Hungerford, T.L. “Taxes and the Economy: An Economic Analysis of the Top Tax Rates Since 1945.” Congressional Research Service. Washington, DC (December 2012).

Koester, R., and R Kormendi. “Taxation, Aggregate Activity and Economic Growth: Cross-Country Evidence on Some Supply-Side Hypotheses.” Economic Inquiry. Vol. 27, No. 3 (July 1989): pp.367-386.

Lee, Y., and R. Gordon. “Tax Structure and Economic Growth.” Journal of Public Economics. Vol. 89, No. 5-6 (June 2005): pp. 1027-1043.

Ljungqvist, A., and M. Smolyansky. “To Cut or Not to Cut? On the Impact of Corporate Taxes on Employment and Income.” NBER Working Paper No. 20753. Cambridge, MA (December 2014).

Lynch, R.G. “Rethinking Growth Strategies. How State and Local Taxes and Services Affect Economic Development Economic Policy Institute.” Economic Policy Institute. (2004).

Mankiw, N. G., D. Romer, and D. N. Weil. “A Contribution to the Empirics of Economic Growth.” The Quarterly Journal of Economics. Vol. 107, No. 2 (May 1992): pp. 407–37.

Mertens, K., and M. O. Ravn. “The Dynamic Effects of Personal and Corporate Income Tax Changes in the United States.” American Economic Review: Vol. 103, No. 4 (June 2013): 1212-47.

Padovano, F., and E. Galli. “Tax Rates and Economic Growth in the OECD Countries.” Economic Inquiry. Vol. 39, No. 1 (January 2001): pp. 44-57.

Partridge, Mark. D., Dan S. Rickman, M. Rose Olfert, & Kamar Ali. (2012). “Dwindling US Internal Migration: Evidence of Spatial Equilibrium or Structural Shifts in Local Labor Markets?” Regional Science and Urban Economics. Vol. 42, No. 1 (January 2012): pp. 375-388.

Prillaman, S.A., and K. J. Meier. “Taxes, Incentives, and Economic Growth: Assessing the Impact of Pro-business Taxes on U.S. State Economies.” The Journal of Politics. Vol. 76, No. 2 (April 2014): pp. 364-379.

Phillips, J., and E. Goss. “The Effect of State and Local Taxes on Economic Development: A Meta–Analysis.” Southern Economic Journal. Vol. 62 No. 2 (October 1995): pp. 320–33.

Rainey, D.V., and K. T. McNamara. “Taxes and the Location Decision of Manufacturing Establishments.” Review of Agricultural Economics. Vol. 21, No. 1 (1999): pp. 86-98.

Reed, R.W. “The Robust Relationship between Taxes and U.S. State Income Growth.” National Tax Journal. Vol. 61, No. 1 (March 2008): pp. 57-80.

Romer, C., and D. Romer. “The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks.” American Economic Review. Vol. 100, No.1 (June 2010): pp. 763-801.

Thompson, W., and J. Matilla. “An Econometric Model of Postwar State Industrial Development.” The American Economic Review. Vol. 50, No. 3 (June 1960): pp. 461-463.

Tomljanovich, M. “The Role of State Fiscal Policy in State Economic Growth.” Contemporary Economic Policy. Vol. 22 No. 3 (July 2004): pp. 318–30.

Wasylenko, M. “Taxation and Economic Development: The State of the Economic Literature.” New England Economic Review. (March/April 1997).

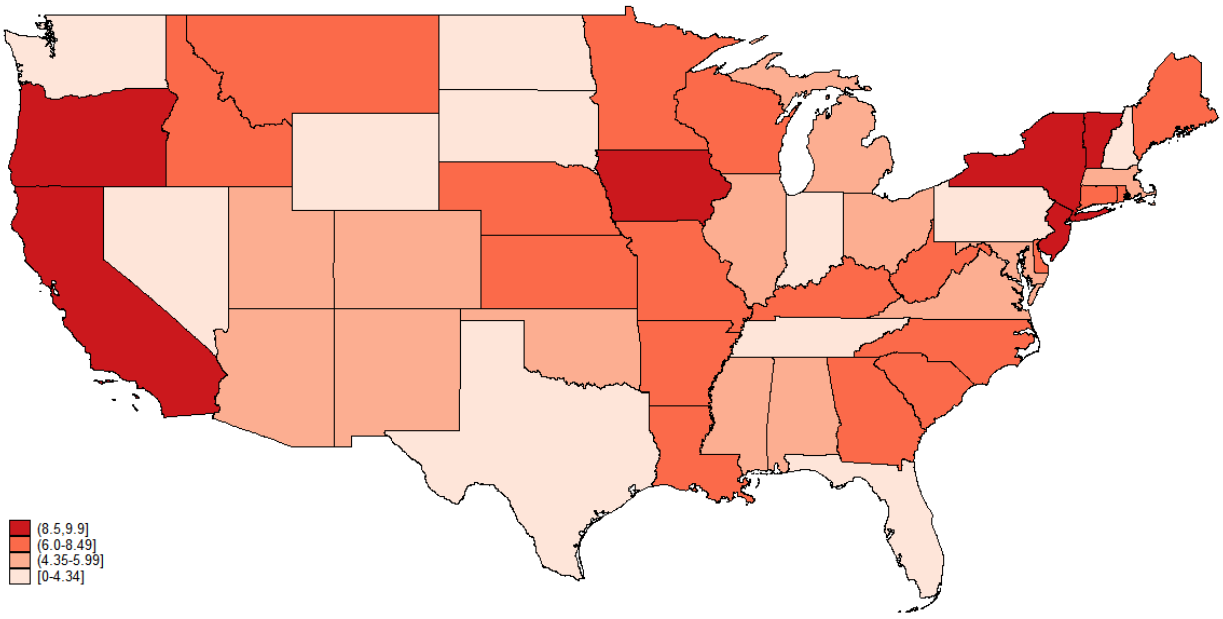

Figure 1. State Individual Top Marginal Tax Rate

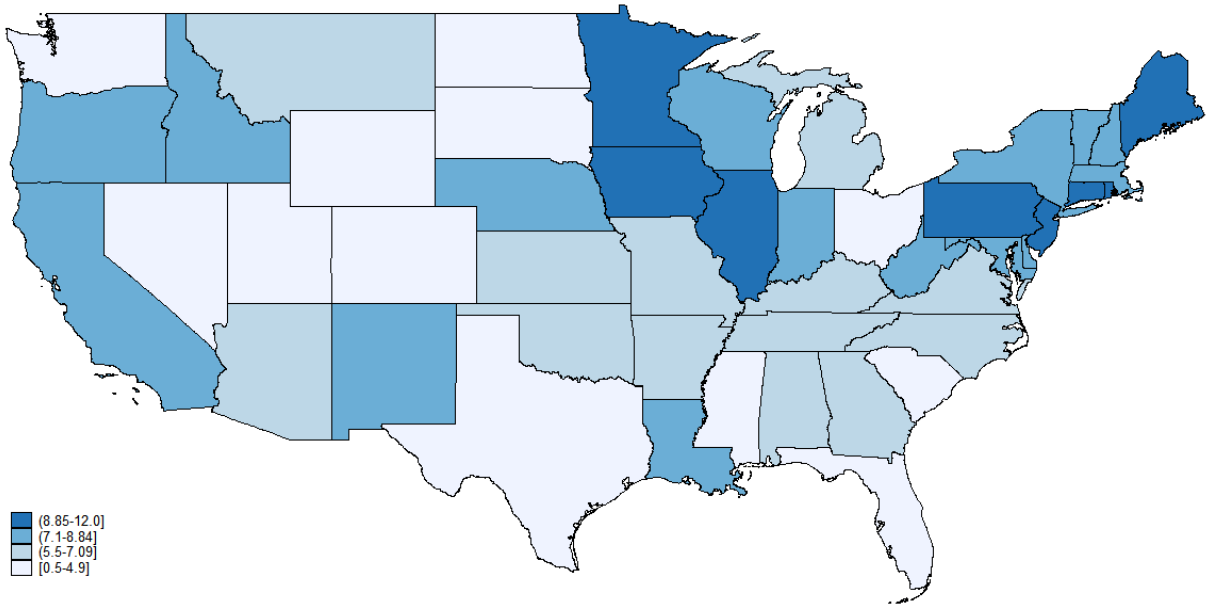

Figure 2. State Corporate Top Marginal Tax Rate

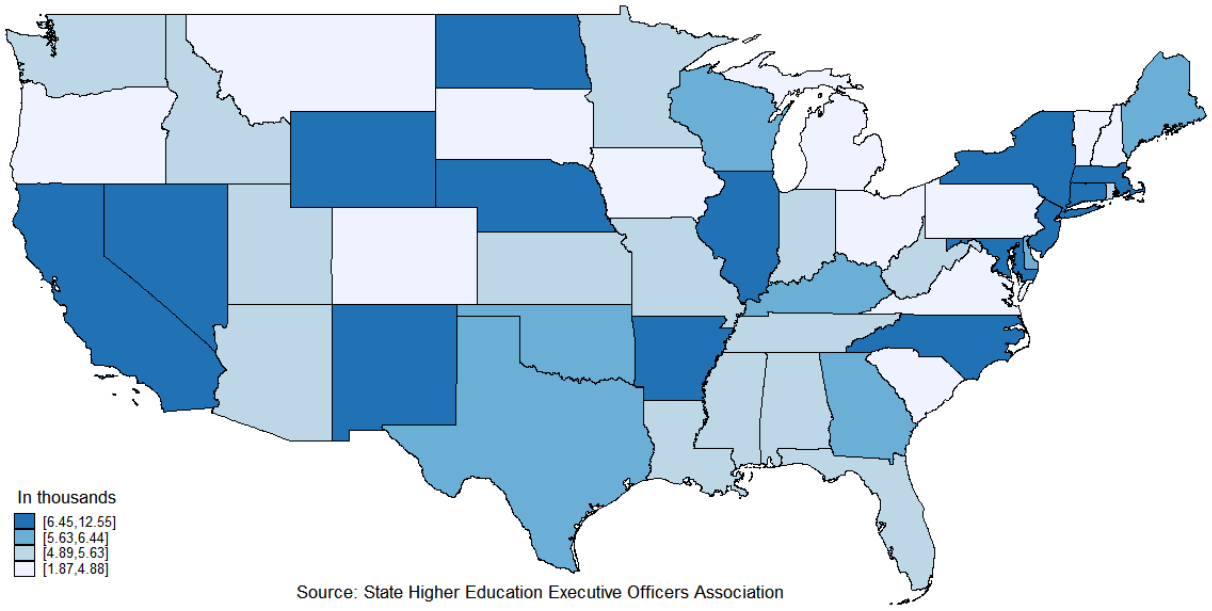

Figure 3. State Higher Education Appropriations per Full Time Student

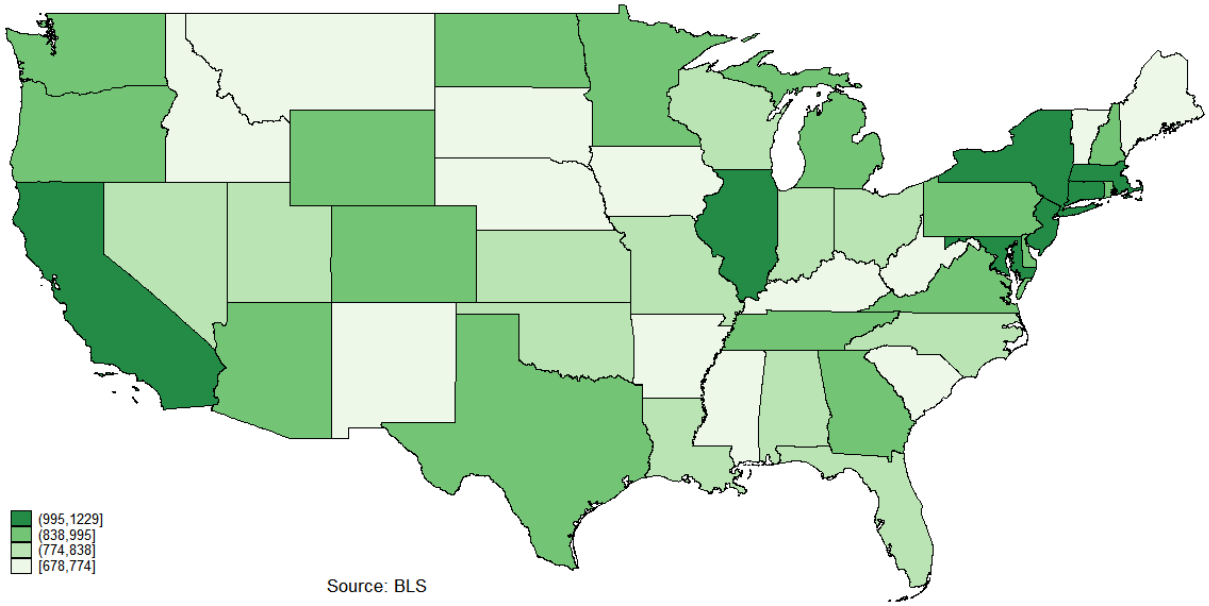

Figure 4. Average Weekly Wage

Table 1. Data Descriptive Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
Total Private Sector Jobs (thousands)	2209.09	2323.58	178.60	12916.20
Total Manufacturing Jobs (thousands)	277.53	285.87	8.70	1855.50
Total Retail Jobs (thousands)	293.53	306.10	29.20	1689.90
Violent Crime rate per 100,000	397.59	169.40	78.20	828.10
Poverty rate	12.42	3.29	4.50	23.10
State Higher Education Appropriations per FTE (thousands)	7.51	2.25	1.87	16.42
Housing Price Index	193.25	40.39	90.37	338.34
Commercial Electricity Price per kw/h	8.84	3.27	4.24	34.88
Industrial Mix	0.17	0.42	-1.05	3.25
Corporate Income Tax Rate	6.67	2.81	0.00	12.00
Industrial Income Tax Rate	5.38	3.03	0.00	12.00
Average Weekly Wage	741.39	145.98	464.00	1229.00
Minimum Wage	6.17	1.05	5.15	9.04
Property Tax per capita	23.13	23.51	0.00	127.70

Table 2. Total Private Jobs Growth Results

	Coefficient	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Violent Crime rate per 100,000	0.074**	0.034	2.17	0.035	0.005	0.142
Poverty rate	-0.777*	0.435	-1.79	0.080	-1.652	0.097
Educational Appropriations per FTE (thousands)	6.006***	1.201	5.00	0.000	3.592	8.420
Housing price Index	0.086*	0.050	1.73	0.089	-0.014	0.186
Commercial electricity price per kw/h	-0.540	0.780	-0.69	0.492	-2.107	1.027
Corporate Income tax rate	-0.334	1.718	-0.19	0.847	-3.786	3.119
Individual Income tax rate	-3.831***	1.185	-3.23	0.002	-6.211	-1.450
Average weekly wage	0.178***	0.080	2.23	0.030	0.018	0.339
Minimum wage	-0.780	2.115	-0.37	0.714	-5.030	3.469
Property tax per capita	0.000	0.117	0.00	0.999	-0.236	0.235
Industrial Mix	1.945	1.980	0.98	0.331	-2.035	5.925
R-squared = 0.9490 N = 600						

*** significant at 1% level, ** significant at 5% level, * significant at 10% level

Note: Year and state fixed effects dummy parameters are not shown in this table. Standard errors are clustered by state.

Table 3. Retail Jobs Growth Model Regression Results

	Coefficient	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Violent Crime rate per 100,000	0.005	0.005	1.170	0.248	-0.004	0.015
Poverty rate	-0.078	0.088	-0.880	0.383	-0.255	0.100
Educational Appropriations per FTE (thousands)	0.705***	0.199	3.530	0.001	0.304	1.106
Housing price Index	0.011	0.007	1.470	0.147	-0.004	0.025
Commercial electricity price per kw/h	-0.088	0.128	-0.690	0.492	-0.345	0.168
Corporate Income tax rate	0.037	0.234	0.160	0.874	-0.433	0.507
Individual Income tax rate	-0.237	0.154	-1.540	0.130	-0.546	0.072
Average weekly wage	0.011	0.008	1.480	0.147	-0.004	0.027
Minimum wage	0.055	0.314	0.180	0.861	-0.576	0.687
Property tax per capita	-0.022	0.020	-1.110	0.274	-0.061	0.018
Industrial Mix	-0.329*	0.169	-1.950	0.057	-0.668	0.010
R-squared = 0.9787 N = 600						

*** significant at 1% level, ** significant at 5% level, * significant at 10% level

Note: Year and state fixed effects dummy parameters are not shown in this table. Standard errors are clustered by state.

Table 4. Manufacturing Jobs Growth Model Regression Results

	Coefficient	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Violent Crime rate per 100,000	0.013	0.008	1.650	0.104	-0.003	0.029
Poverty rate	0.054	0.172	0.320	0.754	-0.291	0.399
Educational Appropriations per FTE (thousands)	1.038***	0.369	2.820	0.007	0.297	1.778
Housing price Index	0.028**	0.013	2.160	0.036	0.002	0.055
Commercial electricity price per kw/h	0.159	0.183	0.870	0.389	-0.208	0.526
Corporate Income tax rate	0.216	0.414	0.520	0.604	-0.615	1.047
Individual Income tax rate	-0.564	0.369	-1.530	0.132	-1.305	0.177
Average weekly wage	0.038**	0.014	2.600	0.012	0.009	0.067
Minimum wage	-0.456	0.540	-0.840	0.403	-1.541	0.629
Property tax per capita	-0.060	0.037	-1.610	0.113	-0.134	0.015
Industrial Mix	-1.616**	0.664	-2.430	0.019	-2.950	-0.281
R-squared = 0.9806 N = 600						

*** significant at 1% level, ** significant at 5% level, * significant at 10% level

Note: Year and state fixed effects dummy parameters are not shown in this table. Standard errors are clustered by state.

Table 5. Individual Income Tax Rate Elasticity. Omitted, where tax rate = 0

Coefficient -3.83	State Tax rate	Change in tax rate	Total job gains	% of total jobs	Elasticity
Alabama	5.00	-20.00%	17,051.16	1.131%	-0.057
Alaska	0.00				
Arizona	4.54	-22.03%	19,766.63	0.963%	-0.044
Arkansas	7.00	-14.29%	10,260.57	1.068%	-0.075
California	9.30	-10.75%	130,174.04	1.056%	-0.098
Colorado	4.63	-21.60%	16,572.41	0.864%	-0.040
Connecticut	6.70	-14.93%	13,067.96	0.932%	-0.062
Delaware	6.75	-14.81%	3,010.38	0.846%	-0.057
Florida	0.00				
Georgia	6.00	-16.67%	31,509.41	0.964%	-0.058
Hawaii	11.00	-9.09%	4,649.62	0.967%	-0.106
Idaho	7.80	-12.82%	4,975.17	0.985%	-0.077
Illinois	5.00	-20.00%	47,622.22	0.968%	-0.048
Indiana	3.40	-29.41%	23,332.36	0.943%	-0.032
Iowa	8.98	-11.14%	11,218.07	0.894%	-0.080
Kansas	6.45	-15.50%	10,318.02	0.939%	-0.061
Kentucky	6.00	-16.67%	15,507.67	1.045%	-0.063
Louisiana	6.00	-16.67%	17,127.76	1.086%	-0.065
Maine	8.50	-11.76%	4,890.91	0.985%	-0.084
Maryland	5.50	-18.18%	20,341.13	0.983%	-0.054
Massachusetts	5.30	-18.87%	24,362.63	0.848%	-0.045
Michigan	4.35	-22.99%	38,116.16	1.113%	-0.048
Minnesota	7.85	-12.74%	18,897.22	0.815%	-0.064
Mississippi	5.00	-20.00%	10,907.84	1.274%	-0.064
Missouri	6.00	-16.67%	21,474.81	0.956%	-0.057
Montana	6.90	-14.49%	3,462.32	0.987%	-0.068
Nebraska	6.84	-14.62%	6,564.62	0.820%	-0.056

Nevada	0.00				
New Hampshire	0.00				
New Jersey	8.97	-11.15%	32,290.73	0.986%	-0.088
New Mexico	4.90	-20.41%	6,974.43	1.139%	-0.056
New York	8.82	-11.34%	72,777.66	0.992%	-0.087
North Carolina	7.75	-12.90%	30,954.06	0.946%	-0.073
North Dakota	3.99	-25.06%	2,458.86	0.704%	-0.028
Ohio	5.93	-16.88%	43,524.12	0.983%	-0.058
Oklahoma	5.25	-19.05%	13,228.82	1.044%	-0.055
Oregon	9.90	-10.10%	13,136.90	0.974%	-0.096
Pennsylvania	3.07	-32.57%	47,047.72	0.942%	-0.029
Rhode Island	5.99	-16.69%	4,021.50	0.992%	-0.059
South Carolina	7.00	-14.29%	15,411.92	1.019%	-0.071
South Dakota	0.00				
Tennessee	0.00				
Texas	0.00				
Utah	5.00	-20.00%	8,598.35	0.837%	-0.042
Vermont	8.95	-11.17%	2,336.30	0.937%	-0.084
Virginia	5.75	-17.39%	27,215.98	0.899%	-0.052
Washington	0.00				
West Virginia	6.50	-15.38%	6,920.81	1.132%	-0.074
Wisconsin	7.75	-12.90%	20,582.42	0.865%	-0.067
Wyoming	0.00				-0.057
Average Elasticity					-0.06302
Weighted Average Elasticity					-0.05342

Note: States that do not have individual tax rate are omitted in the table.
Change in the tax rate is percentage change from current level. Percent of total jobs is the expected job gains divided by current total private jobs. Elasticity is calculated as expected job gains divided by change in tax rate. Weighted average elasticity is weighted for population.