State Tax Policy and Entrepreneurial Activity

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Engaging in entrepreneurship and starting a small business can be made more or less difficult by the structure of income taxes. While federal income taxes are the single largest tax on small business, state and local taxes can also impact small firms. Recent studies have shown how federal income tax rates can affect decisions to engage in entrepreneurial activities; this study tests whether the same pattern holds for state tax policy. The paper examines the impact of both state tax rates and tax composition (i.e., which taxes are imposed and in what proportion) on entrepreneurship rates.

There is substantial variation in both the structure of taxes and tax rates across the 50 states. The paper identifies the effects of tax rates and tax composition on entrepreneurship. Using state-level data from 1989 through 2001 on taxes and entrepreneurship, the authors attempt to isolate the impact of tax policy by examining aggregate rates of entrepreneurship. Two entrepreneurship measures are employed: one is the number of filers of Schedule C on their federal income tax returns, and the second is the share of all non-farm employees who are sole proprietors. The paper examines not only the impact of tax policy on the number of entrepreneurs in the state using the two measures, but also on the state's share of all U.S. entrepreneurs. The effects of tax rates are estimated with top marginal tax rates for a number of different state taxes, including personal income tax, sales tax, corporate income tax, estate tax, inheritance tax, and gift tax. Other tax policy variables, such as combined reporting and throwback rules which affect where corporations must file taxes, and homestead rules which affect bankruptcy filings, are also examined.

Overall Findings

State tax policy, including both tax rates and the type of taxes in a state's portfolio, has only a modest effect on aggregate state entrepreneurship rates.

Highlights

• Higher top tax rates on individual income, higher sales tax rates, and the existence of state-level inheritance or gift taxes all tend to slightly reduce a state's share of the national entrepreneurial stock;

• Top marginal tax rates on individual and corporate income do not have statistically significant effects on state entrepreneurship rates, but states with higher sales tax rates tend to have higher entrepreneurship rates;

• States with combined reporting and throwback rules for corporate income taxes tend to have higher entrepreneurship rates;

• The composition of state tax portfolios (which taxes are imposed and what share of total taxes each imposes) is not a significant determinant of state entrepreneurship rates.

Scope and Methodology

The researchers use a panel of aggregated state-level tax data to estimate the effects of tax policy on entrepreneurship. These data include as explanatory variables state tax rates for personal income, sales, and corporate taxes; control variables for demographics and state fiscal policy; and state economic variables, such as employment and output measures. The primary dependent variables of interest are the number of entrepreneurs in the state, measured by either a

tax or employment proxy, and the state's share of national entrepreneurial stock, measured again by either the tax or employment proxy share of the relevant national stock.

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Executive Summary

Despite a recent flurry of empirical research on the effects of taxes on small business activity, state-level taxes faced by entrepreneurs have been largely overlooked. Only a few studies have examined the effects of state tax policies on entrepreneurial activity, but those have focused either on a small number of industries or only one or two taxes. In addition to federal payroll taxes and income taxes at the individual and corporate level, small businesses are responsible for a vast array of state taxes, including sales and property taxes. Recent research reveals that the latter are actually more important than income taxes in terms of business tax burdens at the state level.

We analyze a 50-state panel of detailed tax policy information spanning the years 1989 through 2001 to make a number of contributions to this growing literature. First, we consider a broad set of tax policies in addition to the usual menu of tax rates. This includes the first known analysis of the effects of state tax portfolios (the share of state tax revenues generated by various major taxes) on entrepreneurial activity. Second, we examine each state's entrepreneurial stock as well as state shares of the national entrepreneurial stock in order to understand how state tax policy fosters entrepreneurship within a state and the allocation of entrepreneurship across the nation. Third, we explore the importance of using alternative measures of entrepreneurial activity. Specifically, we measure entrepreneurial activity in a state by counting (a) the number of federal Schedule C filers from that state and (b) the number of workers who report that they are self-employed on a national labor survey.

Our analysis reveals the following key findings:

- Higher top tax rates on individual income, higher sales tax rates, and the existence of a state-level estate, inheritance, or gift tax above the federal estate tax all tend to slightly reduce a state's share of the national entrepreneurial stock.

- While top marginal state tax rates on corporate and individual income do not have statistically significant effects on state entrepreneurship rates, states with higher sales tax rates tend to have higher entrepreneurship rates.

- States with combined reporting and throwback rules as part of their corporate income taxes tend to have higher entrepreneurship rates. These effects are above and beyond changes in organizational form among small businesses.

- The composition of state tax portfolios is generally not a significant determinant of state entrepreneurship rates.

1. Introduction[1]

The interplay between tax policy and entrepreneurial activity has enjoyed a resurgence in the empirical economics literature. Most of the recent research has focused on *federal* taxes, however, leaving *state* tax policies relatively unexplored. As states continue to grapple with difficult issues in business taxation and development incentives, a thorough consideration of the effects of state tax policies on entrepreneurial activity becomes even more important, especially when considering the possible benefits that could follow new entrepreneurial ventures through economic growth, innovation, and the like. In this report, we examine the relationships between state tax policy and entrepreneurship using a longitudinal database of detailed information on state tax policies for all 50 U.S. states from 1989 through 2001.[2]

This investigation is warranted for a number of reasons. First, as a result of the focus on federal taxes, earlier research has only considered a subset of the taxes facing small businesses. For example, Cline, Fox, Neubig, and Phillips (2003a and 2003b) show that the total state and local tax burden for U.S. businesses includes much more than direct business taxes such as corporate income taxes or state franchise, excise, or gross receipts taxes. Businesses—especially small businesses—also pay significant amounts of property and sales taxes, along with a growing menu of miscellaneous charges and fees. The existing array of state tax structures provides a virtual cornucopia of exogenous policy variation that can be used to cleanly identify entrepreneurial responses.[3]

The extent to which tax policies—especially state tax policies—actually influence entrepreneurial activity deserves exploration. If taxes do not affect entrepreneurial activity,

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[1] The authors thank Joseph Johnson, William Fox, Matthew Murray, Michael McKee, and Jon Rork for very helpful comments and suggestions.
[2] This report extends the preliminary analysis in Bruce, Deskins, and Mohsin (2004).
[3] Beale (2004) provides an exhaustive account of state and local policies encountered by home-based businesses.

using tax policy to encourage innovation or growth through entrepreneurship is not likely to be fruitful. Alternatively, if a nonzero effect can be determined, the actual parameter estimates can be used to more efficiently design tax policy to achieve desired changes in entrepreneurship.

Results of this study indicate that top statutory tax rates on personal or corporate income do not have statistically significant effects on observed rates of entrepreneurship. Higher sales tax rates actually increase state entrepreneurship rates, but reduce a state's share of the national entrepreneurial stock. States with combined reporting requirements and throwback rules as part of their corporate income tax have higher entrepreneurship rates. States with more progressive personal income taxes have slightly higher entrepreneurship rates.

All of these effects, while statistically significant, are quite small in magnitude. Additionally, we do not identify a significant relationship between state tax portfolios (i.e., tax shares) and observed entrepreneurship rates.

2. Existing Literature

Two broad areas of study in the earlier literature motivate this analysis. The first is the literature on the effects of state tax policies on business location decisions. These results are important because business location decisions can have important impacts on measured entrepreneurship or self-employment rates. In his oft-cited review of a vast array of empirical studies, Wasylenko (1997) concludes that taxes have statistically significant but quantitatively small effects on interregional location behavior. In a similar vein, Bartik (1991) concludes that higher state and local taxes reduce business activity in a region with an elasticity of about -0.3, while noting significant deviation from this average across studies.[4] However, this literature may be slightly less relevant to the present study because of its focus on location decisions

among firms. If smaller businesses are less mobile than larger firms, they are perhaps less likely to respond to state differences in tax policies. Further, most state development incentives are targeted at larger manufacturing firms rather than small businesses.

The second broad area of relevant literature consists of empirical studies of taxation and entrepreneurship. The number of studies in this literature has grown significantly in recent years, largely due to greater availability of useful data. Relevant studies in this area can be divided into three more specific categories: time series studies, microdata studies, and state-level panel analyses. While the first two groups serve as important motivators for this work, the third is most closely related to the present study and is discussed in significantly greater detail below.

Older time series studies focus on federal tax policies but rely on time series econometric techniques that have since been found to be problematic. These studies generally conclude that higher federal tax rates cause higher rates of entrepreneurship, specifically defined as self-employment (Long [1982] and Blau [1987]). Explanations often rest on the idea that high tax rates drive workers out of paid employment, or wage jobs, into entrepreneurial ventures where they can more easily avoid or evade taxes. However, despite significant advances in econometric techniques, more recent studies using modern time series methods find similar positive relationships between tax rates and entrepreneurial activity (Parker [1996], Cowling and Mitchell [1997], and Robson [1998]). None of these studies consider the effects of state taxes.

Despite the consistency of the larger group of times series studies, a more recent and extensive time series analysis in this area, Bruce and Mohsin (Forthcoming), shows that the question of how taxes affect entrepreneurship is not yet settled. In addition to personal income and payroll taxes, Bruce and Mohsin consider corporate income taxes, capital gains taxes, and estate taxes. Results generally indicate that taxes have statistically significant but very small and

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[4] See also Ladd (1998).

scattered effects on entrepreneurship rates. Consequently, they are likely to be ineffective in generating desired changes in entrepreneurial activity.

The second group of studies relies on cross-sectional or panel micro data to examine the influence of tax policies on individual decisions about entrepreneurship. Results from these studies, which use even more sophisticated econometric techniques and examine more broadly defined entrepreneurial activities, have also been inconclusive (Bruce and Gurley [2005], Bruce [2000 and 2002], Carroll, Holtz-Eakin, Rider, and Rosen [2001], Gentry and Hubbard [2000], Moore [2003], and Schuetze [2000]). While some of these have indicated that higher tax rates on self-employment income have ambiguous effects on self-employment rates, a growing consensus suggests that tax rate increases reduce entrepreneurial entry, growth, hiring, investment, and survival. State taxes have been considered in only a portion of these studies, however, and then only as a component of a combined federal and state income tax rate.

The final group of studies uses state-level time series or panel data to explicitly examine the effects of state tax policies on entrepreneurial activity and is therefore most relevant to the current paper. Carlton (1979) finds no strong evidence that local taxes influence the number of firm births. He uses rather rough proxies for tax variables, however, and only considers three industries for a limited time period. Bartik (1989) uses more detailed tax information and a broader array of industries and finds that higher property taxes, corporate taxes, and sales taxes on equipment negatively impact small business start-ups.[5] He also finds that personal income taxes and general sales taxes are not statistically significant, while government spending has mixed effects depending on the category of spending. His survey of earlier studies finds elasticities that are generally below 0.5 in absolute value.

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[5] Bartik (1989) extended the preliminary results in Bartik (1987).

Chen and Williams (1999) examine business failure rates from 1984 through 1993, estimating panel regressions for each of a number of industry categories. Although their focus is not exclusively on small businesses, they find that higher sales taxes per capita increase business failure rates for low-tech industries, while higher corporate income taxes per capita lead to lower failure rates for high-tech industries. Kreft and Sobel (2003) find that the existence of state inheritance taxes above the federal level is associated with lower rates of growth in the number of sole proprietors between 1996 and 2000.

The empirical framework of this study most closely resembles that of Georgellis and Wall (2002), who use panel regressions to examine the various determinants of state-level entrepreneurship.[6] Using data from 1991-1998, they find that the maximum (state plus federal) marginal tax rate exerts a u-shaped effect on the number of non-farm sole proprietors as a share of the working-age population. An increase in the marginal tax rate (MTR) reduces entrepreneurship up to a minimum effect at an MTR of about 35 percent, after which MTR increases lead to more entrepreneurial activity. No other tax variables are included in their analysis.

In sum, the previous literature has found that state tax policies can be important determinants of entrepreneurial activity, but magnitudes, signs, and statistical significance levels have not been conclusive, warranting additional research. This lack of consensus pertains especially to the effects of state-level tax policies on entrepreneurial activity. The present study expands upon the earlier literature in several ways. First, we consider a much broader set of tax policies in addition to the usual menu of tax rates. Second, we examine both a state's entrepreneurial stock as well as its share of the national entrepreneurship stock in order to

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[6] Georgellis and Wall (2000) develop the theory and empirical methods that are the foundation for this more recent paper, but the focus in the earlier paper is on British data and no regional tax policy variables are considered.

understand how state tax policy both fosters entrepreneurship within a state as well as the

location of entrepreneurship across the nation. Third, we go beyond explicit tax policy variables

to examine the influence of state tax portfolios (i.e., the share of total state taxes generated by

each tax) on entrepreneurial activity. Finally, we use more recent data covering the period from

1989 through 2001 and test for robustness using alternative measures of entrepreneurial activity.

3. Data and Empirical Methodology

Entrepreneurship Measures

Our baseline empirical approach follows that of Georgellis and Wall (2002) and consists

of panel regressions that explain state rates of entrepreneurial activity as a function of tax

variables and other controls. The first question is what to use as the appropriate measure of

entrepreneurship. Nearly all studies in this literature struggle with the definition and

measurement of entrepreneurship. Indeed, the notion of "entrepreneurial spirit" is something of

an elusive concept. Therefore, a proxy must be used.

To this end, most of the prior studies have used a variant of a self-employment rate or a

firm birth rate, primarily because these are the easiest measures to obtain. Given that not all

entrepreneurs are self-employed and that not all self-employed workers can be considered

entrepreneurial, this study considers two different measures of state entrepreneurship. The first

is the number of federal individual income tax returns with income from a small business or

profession (Schedule C) as a share of all individual income tax returns filed from each state. The

second is based on data from the Bureau of Economic Analysis (BEA) and counts the share of all

non-farm workers in each state who are sole proprietors.[7]

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[7] A third useful measure of entrepreneurship is those individuals who receive income from other small businesses such as partnerships or S-corporations. However, state-level data on income from these sources is not widely

A common criticism of virtually all measures of entrepreneurial or small business activity is that they include part-time and so-called partial entrepreneurs. No consensus has arisen about how to address this, or even what the consequences might be for empirical research. On the surface, one might imagine that part-timers might be less sensitive to tax rates or other policies since they might be less invested in their small business. On the other hand, this same group might actually be more responsive to tax policies since they have other sources of income. Indeed, some part-timers are engaged in entrepreneurial activity purely for the tax benefits it provides. In sum, it is not clear how the inclusion of part-timers might affect empirical results.[8]

In the analysis that follows, these entrepreneurial measures are viewed in two distinct ways. The first is to measure the figures simply as the stock of entrepreneurship in a state, as described above. In addition, these measures are converted into state shares of the national entrepreneurial stock. The first point of view, entrepreneurial stock, will provide an understanding that abstracts from cross-state locational effects of tax policy on entrepreneurship. The focus here is on the effect of tax policy on the tendency to start and maintain a small business. This approach is useful because many entrepreneurs are involved only in smaller operations that do not span state boundaries. Alternatively, the entrepreneurial share specifications address the possibility that some entrepreneurs cross state lines and are responsive to tax policies in other states. This view will allow the results to be expressed more in terms of the effects of state tax policies on the allocation of entrepreneurial activity across the states.[9]

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available in a continuous panel. Also, while we exclude agricultural entrepreneurs in our baseline approach, we examine the effects of including them in the robustness checks that follow.

[8] It is also unclear how one might accurately identify and remove part-time or partial entrepreneurs from publicly-available measures such as those in our study.

[9] The tax return measure of state entrepreneurial share is the ratio of the number of personal income tax returns with a Schedule C in a state to the number of returns with a Schedule C in the nation. The employment-based measure is calculated as the number of self-employed individuals in a state divided by the national total of self-employed individuals.

The first four columns of Table 1 present values of both the tax return and employment measure for each state's entrepreneurial stock. Data are shown for the endpoints of our period of analysis—1989 and 2001—to provide a sense of the changes in entrepreneurial activity across states and over time. A few key themes emerge from this table. First, states with higher rates of entrepreneurial activity for the tax return measure typically have higher rates for the employment measure, although a number of exceptions arise in the data. In fact, the correlation coefficient between these two variables is 0.89. Second, as shown by Georgellis and Wall (2002), entrepreneurial activity has grown over time in most states. Figure 1 displays the average of both measures of entrepreneurial stock across all 50 states over the time period of the analysis. While the employment measure appears to have grown steadily, the tax return measure grew quickly and then leveled off in the early 1990s. The last four columns of Table 1 present state shares of the national entrepreneurial stock for each of the two measures. The two entrepreneurial share measures are also similar. However, it appears that state shares of entrepreneurship typically did not change by large amounts between 1989 and 2001.

Statutory Tax Rates

Our principal task in this study is to uncover the various determinants of state and time variation in entrepreneurial activity, focusing primarily on the role of state tax policies. In the spirit of the prior literature, we begin with a consideration of statutory tax rates. Figure 2 shows averages across the 50 states of the top marginal corporate income tax (CIT) rate, the top marginal personal income tax (PIT) rate, and the state sales tax rate for the time period of our analysis.[10]

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[10] While many small businesses will not actually face the top marginal rates used in our analysis, we view the top rates as useful policy signals in entrepreneurial decisions. However, we experiment with measures of effective tax rates in the analysis below.

Corporate income taxes can influence entrepreneurial activity in a few ways, one being decisions regarding organizational form. If CIT rates are high relative to PIT rates, for example, new businesses might choose to organize as unincorporated sole proprietorships to reduce taxes. This effect is artificial in that it only alters measured entrepreneurship, not true entrepreneurial activity. A second influence could be that high CIT rates could indicate that a state prefers to shift relatively more of its tax burden onto businesses. As shown, top CIT rates have remained relatively stable, increasing only slightly during the mid-1990s. It remains to be seen whether this small increase contributed to the growth in the stock of entrepreneurs shown in Figure 1.

Personal income tax rates can affect entrepreneurs in many ways. As PIT rates increase, the returns to small business activity decline for sole proprietors. In addition, personal income taxes can insure against risk if rates are progressive and loss offset provisions are available. Top PIT rates increased dramatically around the recession of the early 1990s, but have gradually fallen since then to around their 1990 level. Again, the extent to which this trend has influenced entrepreneurial activity remains to be seen.

Although CIT and PIT rates are clearly important to small businesses, Cline, et al. (2003a and 2003b) show that other state and local taxes are more important in practice. For example, it is well known among state and local tax experts that businesses are responsible for a significant share of state and local sales taxes (Ring, 1999). As sales tax bases have eroded in recent years (Bruce and Fox, 2000), states have responded by raising sales tax rates as shown in Figure 2. If this growth represents a net increase in business taxes, this trend could have influenced state entrepreneurship rates. Alternatively, entrepreneurs might favor higher sales tax burdens in exchange for lower personal and corporate income tax burdens. We will return to this in the following section.

Other Elements of State Tax Policy

The analysis that follows moves beyond statutory tax rates and considers a number of other aspects of state tax policies. Unfortunately, the diversity of tax rules surrounding state property taxes on businesses makes empirical consideration of them quite difficult. Nonetheless, it is possible to control for a variety of other potentially relevant policies. Included first is a set of policy indicators involving state CIT structures. These consist of the sales factor weight in each state's CIT apportionment formula and dummies for the presence of a combined reporting requirement, a throwback rule, and legislation allowing limited liability corporations (LLCs).

Corporate profits for multi-state firms are apportioned for tax purposes to the states in which they have nexus. The apportionment formulas used by states typically consider the share of the firm's payroll, property, and sales. Equal weights were traditionally placed on the three factors, but many states have opted to increase the weight on sales in order to shift the CIT burden from multi-state businesses that manufacture within a state to those that manufacture out-of-state but sell into that state. Thus, higher sales factor weights might be associated with more entrepreneurial activity within a state's borders.

Combined reporting rules are set up to force multi-unit firms to file a single CIT return rather than separate returns for each unit of the firm. These rules are intended to keep multi-unit firms from shifting taxable profits out of a state. Similarly, throwback rules are designed to ensure that all income is taxed somewhere. If a multi-state firm is able to locate profits in a state that does not tax corporate income or in which the firm does not have nexus, income which is not taxed (known as "nowhere income") is "thrown back" to the home state if that state has a throwback rule. Both of these rules have become popular as states have attempted to restore shrinking CIT bases in recent years. The presence of these rules might represent a state's overall

effort to shift a larger part of its tax burden onto businesses. This relates to entrepreneurship in that a tax climate that attempts to shift the tax burden onto businesses could potentially discourage entrepreneurs from starting new businesses. On the other hand, in similar fashion to high CIT rates, combined reporting or throwback rules could encourage small businesses to remain small (or at least not incorporate). The rules could therefore result in an increase in the stock of entrepreneurship as measured by our two variables.

Finally, observed rates of entrepreneurship are expected to be higher in states that allow LLCs (or allowed them first since all states allowed LLCs by the end of 1997) because LLC owners (of single-owner LLCs only) would file a Schedule C with their federal return or call themselves self-employed on a labor market survey. Of course, this change only represents a change in organizational form and not an increase in economic activity.

To incorporate additional elements of state policy, we also include a simple count of the number of tax and non-tax incentive programs that states offer to encourage economic development. It is expected that individuals and firms might respond to incentive packages offered by government for business development. However, an incentive variable may not perfectly correspond to entrepreneurship as many of the incentives are targeted at large, pre-existing firms or new branches thereof.

We also include a dummy variable for whether a state imposes an inheritance, estate, or gift tax above the federal tax in a given year.[11] These taxes may reduce the amount of entrepreneurship in a state either by reducing the size of an entrepreneurial enterprise upon passage from an original owner to an heir or by reducing the survival probability of a small business (see Conway and Rork, 2004).

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[11] By 2001, most states had eliminated their inheritance, estate, and gift taxes. Instead, they rely on a "pick-up" tax, which captures a portion of federal tax liability and does not affect the overall tax liability on the estate.

Homestead exemptions for bankruptcy proceedings also may affect entrepreneurship by reducing the riskiness of entrepreneurial ventures. The potential losses from an unsuccessful entrepreneurial venture will be lessened as the dollar amount of housing investment that is exempt from being seized upon filing bankruptcy increases (see Berkowitz and White, 2004). Therefore, we include the dollar amount of the state's homestead exemption and a dummy variable to denote those states that have an unlimited homestead exemption.[12]

We control for PIT progressivity by including the change in the average PIT rate (PIT liability divided by state personal income) given a change in income.[13] Gentry and Hubbard (2000) find that more progressivity leads to lower rates of entry into entrepreneurship, suggesting that progressivity serves as a tax on successful entrepreneurs. Greater progressivity also might serve as increased insurance against the risk of entrepreneurship, possibly increasing entrepreneurial activity as a result.

Regarding organizational form effects and the business tax policy variables described above (e.g., combined reporting requirements and throwback rules), an important component of this study is to ensure that the effects of true increases in entrepreneurship are disentangled from artificial changes in observed entrepreneurship rates (following from changes in business organization). This point is especially important for the results surrounding the top CIT rate and combined reporting requirements and throwback rules. For example, it was argued above that a high CIT rate may increase entrepreneurship simply because it deters small businesses from

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[12] For those states with an unlimited homestead exemption, the exemption amount of the state with the largest homestead exemption for the homestead exemption variable is used. Therefore, the coefficient on the unlimited exemption dummy can be interpreted as the marginal effect of having an unlimited exemption relative to the state with the highest (finite) exemption amount.

[13] Specifically, using a married couple with two children as a representative household, the change in the average PIT rate associated with moving from a certain amount below the median income for a family of four to that same amount above median income is calculated. The year 2000 equivalent of this income range is $20,000. In other words, for the year 2000, average PIT rates are calculated at $10,000 below and $10,000 above median income as of 2000. For other years, an income range that is equivalent to $20,000 in 2000 dollars is used.

incorporating. This argument can be interpreted as a simple shifting in the mix of entrepreneurs and incorporated firms rather than a true increase in business activity. This does not reflect the primary intent of this study. Fundamentally, it is most important to examine the relationship between taxes and small businesses creation, not changes in organizational form. Thus, the empirical method of this study ensures that the estimated effects of the relevant policy variables isolate true entrepreneurship increases (as described below).

Tax Shares

In a more significant departure from the previous literature, we consider the effects of state tax portfolios on entrepreneurial activity. Specifically, we include the shares of total state tax revenues generated by the CIT, the PIT, sales taxes, and business licenses and fees in separate analyses. This approach is important for several reasons. First, to the extent that one tax is relatively more important in determining entrepreneurial activity, it stands to reason that states in which that tax is more important might have fewer small businesses than states that do not emphasize that particular tax. For example, some have argued that Tennessee should not impose a personal income tax because the absence of this tax encourages business development. Second, because the many details of the tax structure cannot be perfectly captured in a relatively simple statistical analysis, the tax shares may serve as proxies for the broader structure of the state tax system. As previously stated, this is especially important in light of recent research that reveals that businesses are faced with much more than just corporate income taxes or business license fees (Cline et al., 2003a and 2003b). In addition, it is important to understand how the changing composition of state revenue portfolios (i.e., a shift from sales and business taxes to personal income taxes) may affect small businesses. No other studies have been identified that

consider the relative merits of balanced state tax portfolios versus more concentrated tax structures in terms of their effects on entrepreneurial activity.

Figure 3 displays state averages of these four shares over time.[14] As is widely known, sales taxes have been replaced by personal income taxes as the dominant source of state tax revenue, and the corporate income tax share has generally fallen over time. Business licenses continue to provide a small but steady share of total state taxes.

Other Control Variables

To control for state and time differences in the size and scope of government services, all models include measures of state taxes per capita and local taxes per capita. A higher overall tax burden may deter business activity. Conversely, they may foster activity if businesses focus more on the associated public good expenditures. Non-tax explanatory variables include the state unemployment rate, median income, poverty rate, population density, the rate of job growth, and the share of gross state product (GSP) in the agricultural, service, and manufacturing sectors. The GSP shares may be important if entrepreneurship tends to be more viable in certain sectors. In regressions that explain state entrepreneurial shares, we include the total number of PIT returns for a state (tax return measure) or state population (employment measure) to control for state size. All panel regressions include fixed effects for state-level heterogeneity and fixed effects for the year of the observation.[15] Appendix 1 presents summary statistics for each variable for 1989 and 2001, and Appendix 2 presents data descriptions and source notes.

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[14] We should note that the averages in Figure 3 mask tremendous variation in tax shares between states and over time.
[15] The use of a random effects specification was considered but a Hausman (1978) test revealed that this was statistically inappropriate. Correlation between the regressors and the random effects will likely lead to biased

4. Results and Discussion

Effects of State Tax Rates and Rules on Entrepreneurial Stock

Results for fixed effects regressions of state entrepreneurship rates on statutory tax rates, other indicators of state tax policies, and the full set of non-tax controls are provided in Table 2. Statutory top marginal state corporate income and personal income tax rates do not have statistically significant effects on entrepreneurship rates.[16] In contrast, results indicate that a one-percentage-point rise in the sales tax rate is associated with increases in the tax return and employment based measures of entrepreneurship of 0.165 and 0.113 percentage points, respectively. Given the average tax return and employment based entrepreneurship rates of 14.2 percent and 16.2 percent, respectively, a one-percentage-point increase in the sales tax rate increases these entrepreneurship rates by only 1.2 percent (tax return) and 0.7 percent (employment). If states with higher sales tax rates tend to have lower personal income tax burdens, this result might reflect entrepreneurial preferences for sales-tax-heavy tax structures. We explore this possibility below.

A few of the other included measures of state tax policy have statistically significant impacts on the two measures of entrepreneurial activity. First, states with a combined reporting requirement tend to have rates of entrepreneurial activity that are about 0.67 (tax measure) or 0.44 (employment measure) percentage points higher than states without a combined reporting requirement.[17] In addition, a throwback rule is a significant determinant of employment-based

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coefficient estimates. Additional experimentation with heteroskedasity-robust and state-clustered standard errors and with several additional covariates yielded virtually identical results to those reported herein.

[16] The lack of statistical significance is not attributable to multicollinearity as diagnostics did not reveal a significant degree of correlation among the explanatory variables. In addition, rates were not significant in models that included only tax policy variables.

[17] One hypothesis could be that combined reporting captures regional effects since this requirement is more prevalent in western states. However, in the fixed effects model coefficient estimates are to be interpreted as holding state specific effects constant. Therefore, this effect is driven by changes in this policy *within* states over the timeframe of the analysis and cannot reflect regional effects.

entrepreneurship, but leads to a smaller increase than a combined reporting requirement. These findings are described in more detail below.[18]

The PIT progressivity measure has a positive and significant effect on the employment measure of entrepreneurship, contrary to the findings of Gentry and Hubbard (2000). While they found that increased convexity in the tax rate schedule reduced the probability of entry in entrepreneurship, our results indicate that states with more progressive PIT schedules have higher employment-based measures of entrepreneurship. We attribute this result to three possible effects. First, on the surface, more progressive tax rate schedules involve greater insurance against risk, and therefore, could serve as an incentive for entrepreneurial activity. Second, this result might also be picking up some correlation between tastes for income redistribution (as evidenced by PIT progressivity) and tastes for entrepreneurship or risk-taking at the state level. In other words, states that prefer more income redistribution might also have stronger tastes for entrepreneurship and risk-taking. Third, since we also include the top marginal PIT rate in our model, the progressivity index might be picking up variation in marginal PIT rates at lower points in the income distribution (i.e., given a top marginal rate, more progressivity suggests lower marginal rates at incomes below the median). The important factor from an entrepreneur's perspective, to the extent that this explanation has merit, is that lower initial marginal rates can encourage entrepreneurial activity.

The allowance of LLCs also has an effect on the tax return measure of entrepreneurship. States that allow LLCs (or, since all states now allow LLCs, those that allowed them first) have slightly higher tax-based measures of entrepreneurship despite the finding that employment-based entrepreneurship seems to be unaffected by this policy. This result is intuitive; as

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[18] An argument that policy endogeneity might be driving these results is not compelling, as combined reporting and throwback rules are implemented primarily to recapture shrinking mobile corporate income tax bases.

corporations reclassify themselves as LLCs or as LLCs are otherwise created, their owners (in the case of single ownership) must report income for tax purposes on a Schedule C even though they might not call themselves "self-employed" on a labor market survey.

The number of tax incentives offered by states is associated with slightly higher rates of entrepreneurship. This result is intuitive as tax incentive programs are in part designed to encourage entrepreneurship by reducing entrepreneurial tax burdens; these results indicate they are having some success. However, according to this model, the impact of adding one tax incentive program is very small. One more incentive program increases entrepreneurship by only 0.03 (tax measure) or 0.01 (employment measure) percentage points – an economically insignificant magnitude. We find a negative relationship between non-tax incentive programs and employment-based entrepreneurship.

Although not the focus of this research, results for the remaining controls in Table 2 are worthy of additional discussion. Results show that entrepreneurship rates are higher with higher unemployment rates, echoing some of the earlier literature that finds that self-employment is often used as an alternative to wage employment when jobs are scarce. Nevertheless, results show that employment-based entrepreneurship is higher when job growth is higher. This result suggests that entrepreneurial activity also has pro-cyclical elements (i.e., more small businesses are formed during relatively favorable economic conditions).

Somewhat surprisingly, median income has a significant and negative impact on entrepreneurship rates according to this model. While much of the earlier micro-data studies have found a positive relationship between income and entrepreneurship at the individual level, this finding suggests that lower-income states tend to have more entrepreneurial activity. In

contrast, higher poverty rates are associated with lower entrepreneurship rates (for the employment measure only).

The industrial structure of states is also an important determinant of state entrepreneurial activity when considering the employment based measure. States with larger shares of their GSP in the agricultural sector and smaller shares in their manufacturing sector tend to have higher rates of employment-based entrepreneurial activity. In addition, entrepreneurship is higher in more densely populated states.

Turning back to the results regarding combined reporting requirements and throwback rules, the presence of these policies might represent an overall state tax climate that is less favorable toward larger businesses and perhaps more favorable toward small businesses. Alternatively, such policies might simply deter small businesses from incorporating.[19] It is important to understand whether this effect represents a true increase in entrepreneurship or whether it is simply picking up changes in organizational form. We investigate this by estimating identical models to those in Table 2 except for the inclusion of the total number of non-self-employed firms in the state as an additional explanatory variable.[20] In this context, the coefficients of the combined reporting and throwback rules are interpreted as the effect of these rules on the measures of entrepreneurship, holding the number of non-self-employed firms constant. Results indicate that, after including this control, a combined reporting requirement is still a statistically significant determinant of both measures of entrepreneurship and a throwback rule is statistically significant in the employment-based entrepreneurship equation. Furthermore, the magnitudes of the coefficients are roughly the same as in the prior model. Thus, the

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[19] A third possible explanation could involve tax planning activity. Perhaps, when firms are faced with combined reporting requirements and throwback rules (that are intended to increase tax liability), they are cost-justified in adopting tax planning strategies to offset these effective tax rate increases. Many possible tax planning strategies

appropriate conclusion is that the effects of combined reporting and throwback rules on entrepreneurship represent more than simple organizational form changes since the results show that these rules increase entrepreneurial activity even while holding the number of non-self-employed firms constant (i.e., not allowing it to decrease).[21]

Effects of State Tax Rates and Rules on State Shares of National Entrepreneurship

This section presents an examination of the effects of tax rates and rules on state shares of the national entrepreneurial stock. This consists of regression analysis similar to that presented in Table 2 with the primary difference being that, in this specification, the dependent variable is a state's share of the national entrepreneurial stock. Also included are controls for a state's size, namely the number of PIT returns in a state (tax return measure) or the state's population (employment measure). Table 3 presents these results, which indicate that higher top PIT rates and higher sales tax rates reduce the tax-based entrepreneurial share. Coefficient magnitudes suggest that a one-percentage-point increase in the top PIT rate or sales tax rate will reduce a state's share of national entrepreneurship (for the tax return measure) by 0.8 percent or 1.4 percent, respectively (based on an average entrepreneurial share of 2 percent). Statutory tax rates do not have a statistically distinguishable effect on a state's share of national entrepreneurship for the employment measure. These somewhat small and often insignificant effects reveal the possibility that interstate mobility of small businesses is rather limited.

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could involve the use of outside consultants rather than employees inside the firm. If so, this would increase the number of entrepreneurs based on the measures used here.

[20] Full results of this model are available upon request.

[21] One note of caution with including the number of non-self-employed firms is a possible simultaneity bias. That is, not only could the number of non-self-employed firms help explain self-employment, but self-employment could help explain the number of firms. Controlling for this simultaneity would require an instrument that explains non-self-employed firms but does not have an independent effect on self-employment. Without a proper control, all coefficient estimates could be biased, but the bias will be most acute on the number of non-self-employed firms. Biases on other variables are perhaps less significant. Due to this possible bias, this approach is not considered the baseline model nor is the coefficient on the number of non-self-employed firms in this model interpreted (an interpretation is unnecessary because this variable is only included as a control).

Similar to the earlier results regarding entrepreneurial stock, results identify a significant relationship between combined reporting requirements and the tax-based measure of entrepreneurial share. States with a combined reporting requirement tend to have tax-based entrepreneurial shares that are 0.05 percentage points (or 2.7 percent) higher than states without such a requirement. This result continues to hold when the number of firms in a state (excluding the self-employed) is held constant, again indicating more than a shift in organizational form. In a more significant deviation from the entrepreneurial stock specification, results indicate that states that have inheritance, estate, or gift taxes tend to have tax return entrepreneurial shares that are around 2.5 percent lower than states without such taxes. States that allow for LLCs tend to constitute a lower share of the national entrepreneurial stock than states without such an allowance. States with more tax incentives for economic development tend to have higher entrepreneurial shares. However, the effect is small; states with one additional tax incentive program are associated with national entrepreneurial shares that are 0.3 percent or 0.15 percent higher for the tax return and employment based measures, respectively.

Regarding other control variables, the most striking result is that states with larger state governments, as measured by state taxes per capita, tend to have lower entrepreneurial shares. States with larger local governments tend to have lower employment based entrepreneurial shares. These findings are consistent with the notion that higher total tax burdens (corresponding to more government spending) drive away firms. This finding stands in contrast to the reasoning that firms would be attracted to districts with larger governments due to relatively abundant public good provision. Similar to the entrepreneurial stock specification, estimates present seemingly conflicting results regarding poverty and median income. Higher poverty reduces a state's share of the national entrepreneurial stock, but higher median income reduces it as well

(tax return measure only). In addition, higher unemployment increases a state's entrepreneurial share (employment measure only).

Effects of State Tax Portfolios on Entrepreneurial Activity

The first two columns of Table 4 present a set of results where the state tax rate and other tax policy variables in Table 2 are replaced by state tax share variables for the CIT, PIT, sales tax, and business licenses. Entrepreneurial stock is the dependent variable in these regressions. Only one of the eight tax variable coefficients is statistically different from zero. The PIT share has a negative and significant effect on the employment measure of entrepreneurship. In other words, states that rely more heavily on personal income taxes tend to have slightly lower tax-based entrepreneurship rates. The general lack of statistical significance among the state tax share variables does not support the notion that entrepreneurs collectively favor tax structures with more emphasis on sales taxation and less on income taxation.

Results for the non-tax variables are largely consistent with those in Table 2. One exception is that higher local taxes per capita are associated with higher rates of entrepreneurship, perhaps indicating that entrepreneurs are more likely to survive when local government lends more support to spending programs.

The two columns on the right of Table 4 present results from models that examine the effect of state tax portfolios on the state's share of the national entrepreneurial stock. Similar to the stock regressions, none of the tax shares are found to be statistically significant determinants of a state's share of the national entrepreneurial stock.

Robustness Checks

Effective Tax Rates. A common criticism in studies such as this that rely on top marginal tax rates is that not all entrepreneurs are taxed at the top rates. While marginal rates, and

especially top marginal rates, are viewed as appropriate policy signals that might elicit entrepreneurial responses, it seems appropriate to investigate the sensitivity of the findings above to the use of a set of tax variables that more closely resemble effective tax rates. To this end, we repeat all of the baseline regressions after replacing the top marginal CIT and PIT and sales tax rates with a set of three effective tax rates calculated as the ratio of tax revenue (for the CIT, PIT, and sales taxes) to state personal income. Also included are business licenses relative to state personal income as these fees may significantly affect the success of a small business.[22] Of course, state personal income is not the base for the CIT or business license taxes. However, these measures should serve as sufficient proxies for the true bases of these taxes to the extent that corporate profits are a fixed proportion of state personal income across states and time. Full results of these models are presented in Table 5.

The first two columns of this table present results from the models that use effective tax rates to explain entrepreneurial stock. The primary difference between the effects of effective and statutory tax rates is that the effective sales tax rate does not have a statistically significant effect on either measure of entrepreneurial stock. However, similar to Table 2, none of the other effective tax rates is found to have a statistically significant impact on either measure of entrepreneurial stock. Furthermore, all other tax policy results are largely unchanged from those in Table 2. The single exception is that an LLC allowance does not have a statistically significant effect on tax-based entrepreneurship. Results regarding non-tax controls are also similar.

Turning to entrepreneurial shares in the remaining two columns of Table 5, a state's effective PIT rate has a relatively large effect on a state's entrepreneurial share. A one

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[22] This variable was not included in the baseline regressions since it is difficult to capture a "business license tax rate" when the format of these taxes varies widely across states.

percentage point increase in the effective PIT rate decreases entrepreneurial share by 4.9 percent (tax return measure) or 2.1 percent (employment measure). The effective sales tax rate is no longer a statistically significant determinant of tax-based entrepreneurial share. Regarding the other tax controls, the only difference with examining effective rates is that states with larger homestead exemptions tend to have a larger share of the nation's entrepreneurs (tax return measure only). Results for non-tax controls are largely unchanged.

Agricultural Entrepreneurship. Another common concern in empirical studies of entrepreneurship and self-employment is whether to include entrepreneurs in the agricultural sector. For the baseline models above, the agricultural sector was excluded to parallel previous studies more closely. However, to investigate the sensitivity of these results to the inclusion of agricultural entrepreneurship, the above analysis was repeated with a consideration of agricultural entrepreneurship. Specific additions are (1) the inclusion of individuals who file a PIT return with farm income (Schedule F) as entrepreneurs for the tax-based measure, and (2) a consideration of the ratio of all sole proprietors to all workers instead of just non-farm equivalents for the employment measure. Full results for this exercise with tax policy variables are presented in Table 6.

A primary difference following the inclusion of agricultural entrepreneurs is that the sales tax no longer lowers entrepreneurial stock. In addition, tax and non-tax incentives do not affect entrepreneurial stocks after including agricultural entrepreneurs. A noticeable difference from these two specifications is that states with larger homestead exemptions and those with unlimited homestead exemptions have higher rates of employment-based entrepreneurship. In fact, states with an unlimited homestead exemption are associated with rates of entrepreneurship that are 2.6 percent higher than the state with the largest (finite) exemption amount. Regarding

entrepreneurial shares, the inclusion of agricultural entrepreneurs renders the coefficient of the top CIT rate significant and negative but the top PIT rate is no longer significant.

The inclusion of agricultural entrepreneurs does not significantly change many of the results in the tax shares models (see Table 7). One notable difference is that the PIT tax share no longer reduces a state's entrepreneurial stock (employment measure only) with any degree of statistical precision. In addition, after including agricultural entrepreneurs, results indicate that states with higher license tax shares have higher entrepreneurial shares (tax return measure only). Results regarding other non-tax controls are similar.

5. Conclusions

In this study, we present an examination of state-level panel data for the period from 1989 through 2001 to better understand the relationship between state tax policies and entrepreneurial activity. Regression analyses indicate that top marginal state tax rates on personal income and corporate income do not have statistically significant effects on state entrepreneurship rates. Higher sales tax rates tend to increase measured entrepreneurship rates, however, while also slightly reducing a state's share of the national entrepreneurial stock. States with more aggressive corporate income taxes, specifically including combined reporting and throwback rules, tend to have higher entrepreneurship rates. Paradoxically, states with more progressive individual income taxes also tend to have higher entrepreneurship rates. Higher individual income tax rates and the existence of a state-level estate, inheritance, or gift tax above the federal estate tax are both associated with lower state shares of the national entrepreneurial stock. All of these significant effects are quite small in magnitude, however. We also find no evidence of a significant effect of state tax portfolios on entrepreneurial activity. These results

are important in the design of state tax policy. Rather than attempt to target tax breaks to small businesses, states should focus on traditional tax reforms involving lower tax rates, broader tax bases, and simpler tax systems that will create a more productive tax environment for small businesses, large businesses, and individuals alike.

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Figure 1: Average State Entrepreneurship Rates
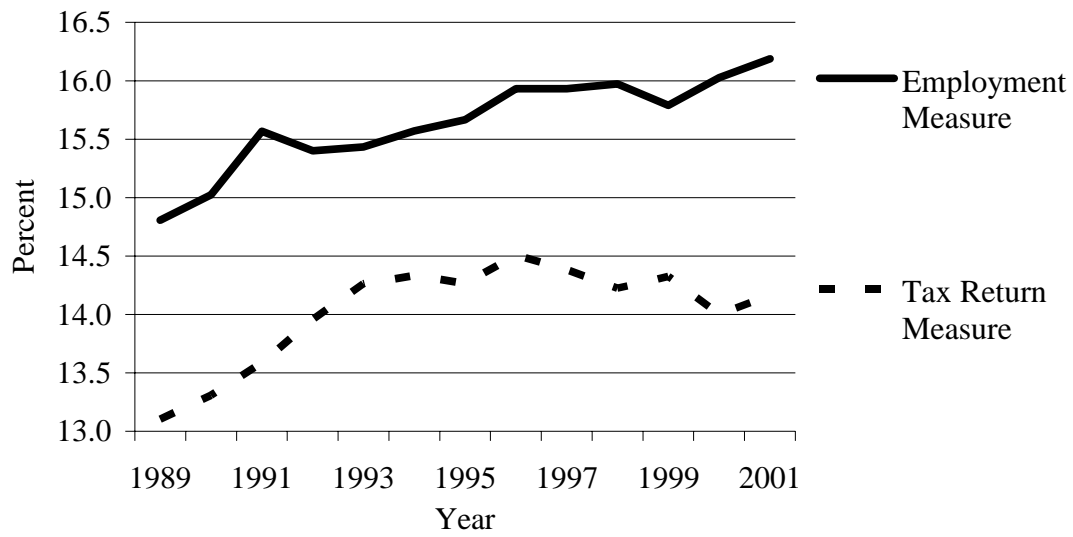
Source: Donald Bruce and John Deskins, *State Tax Policy and Entrepreneurial Activity,* U.S. Small Business Administration, Office of Advocacy, 2006.

Figure 2: Average State Tax Rates
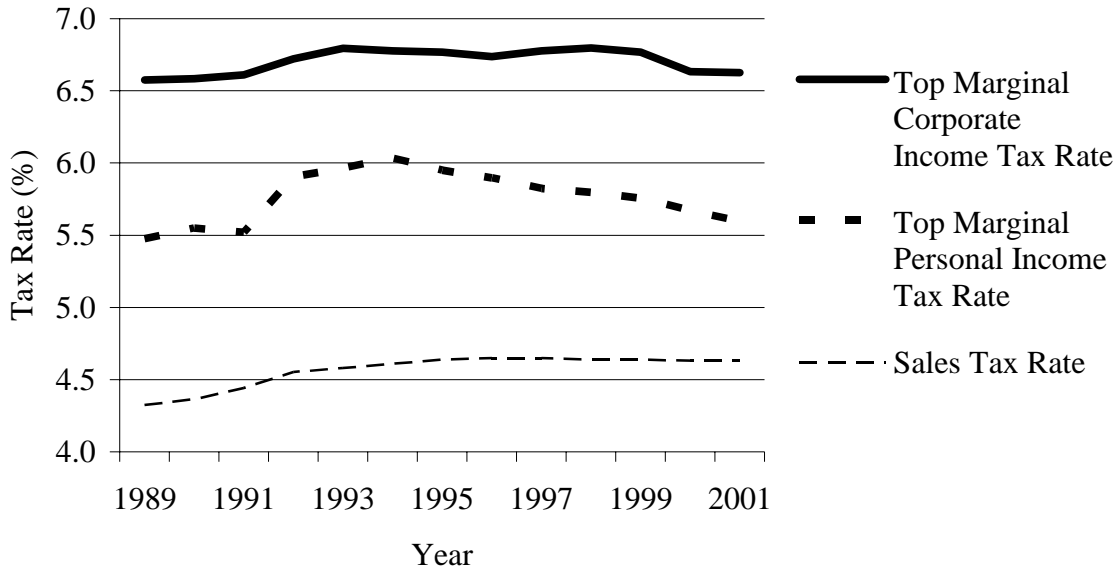
Source: Donald Bruce and John Deskins, *State Tax Policy and Entrepreneurial Activity,* U.S. Small Business Administration, Office of Advocacy, 2006.

Figure 3: Average State Tax Shares

Source: Donald Bruce and John Deskins, *State Tax Policy and Entrepreneurial Activity,* U.S. Small Business Administration, Office of Advocacy, 2006.

Table 1: Entrepreneurship Rates and Shares by State

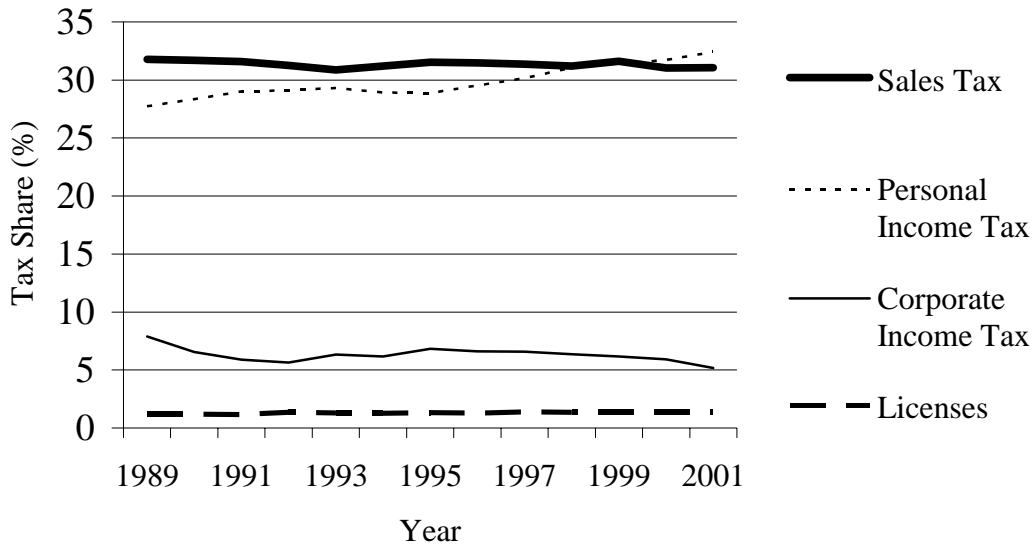|	Stock of Entrepreneurship				Share of Entrepreneurship			
	Tax Return Measure[1]		Employment Measure[2]		Tax Return Measure[3]		Employment Measure[4]	
	1989	2001	1989	2001	1989	2001	1989	2001
Alabama	11.3	13.4	12.1	14.3	1.3	1.4	1.3	1.3
Alaska	15.9	16.1	21.1	21.6	0.4	0.3	0.4	0.3
Arizona	13.2	13.3	15.7	16.3	1.5	1.6	1.6	1.8
Arkansas	14.0	15.0	15.7	15.7	1.0	0.9	1.0	0.9
California	14.8	16.1	16.1	19.6	14.2	13.4	14.0	14.7
Colorado	16.6	16.3	18.9	19.3	1.8	1.9	2.0	2.2
Connecticut	11.6	13.4	13.8	16.6	1.4	1.2	1.5	1.4
Delaware	9.5	10.5	10.8	12.4	0.2	0.2	0.2	0.2
Florida	12.6	14.2	14.0	15.6	5.4	6.0	4.9	5.4
Georgia	11.9	14.4	11.5	14.2	2.4	2.9	2.2	2.6
Hawaii	12.9	14.3	13.8	17.5	0.5	0.5	0.5	0.5
Idaho	16.6	16.9	19.6	20.0	0.5	0.5	0.5	0.6
Illinois	11.0	12.5	12.5	14.5	4.1	4.0	4.1	4.1
Indiana	11.6	12.3	12.4	14.0	2.1	1.9	1.9	1.9
Iowa	13.7	14.5	15.0	15.9	1.2	1.1	1.2	1.1
Kansas	14.7	14.6	16.6	16.2	1.1	1.0	1.2	1.1
Kentucky	13.1	14.0	13.1	14.0	1.4	1.4	1.2	1.2
Louisiana	12.5	13.5	13.4	14.5	1.5	1.4	1.4	1.3
Maine	15.5	17.2	16.8	19.8	0.6	0.6	0.6	0.6
Maryland	11.2	13.5	13.5	16.0	1.8	1.9	1.9	1.9
Massachusetts	12.1	13.8	12.2	15.4	2.5	2.4	2.4	2.5
Michigan	10.8	12.2	12.6	14.1	3.2	3.1	3.1	3.0
Minnesota	14.3	14.5	14.2	15.1	2.0	1.9	1.9	1.9
Mississippi	11.6	13.2	12.8	14.1	0.8	0.9	0.8	0.8
Missouri	12.9	13.7	13.6	15.2	2.1	1.9	2.0	2.0
Montana	17.0	18.0	21.1	22.6	0.4	0.4	0.4	0.5
Nebraska	13.9	14.6	15.0	15.5	0.7	0.6	0.7	0.7
Nevada	11.6	12.0	12.9	14.6	0.5	0.7	0.5	0.7
New Hampshire	14.3	14.9	16.2	18.3	0.6	0.5	0.6	0.6
New Jersey	10.3	12.0	12.6	14.2	2.8	2.7	2.9	2.6
New Mexico	13.8	15.5	17.0	16.7	0.6	0.7	0.7	0.6
New York	10.9	14.9	11.7	15.2	6.3	7.1	6.1	6.1
North Carolina	11.8	14.1	12.2	14.7	2.5	2.8	2.5	2.7
North Dakota	13.6	14.7	16.5	16.6	0.3	0.2	0.3	0.3
Ohio	10.9	11.7	12.3	13.8	3.9	3.6	3.8	3.6
Oklahoma	16.5	16.2	19.1	18.0	1.5	1.3	1.6	1.3
Oregon	14.8	15.1	17.3	18.4	1.3	1.3	1.4	1.4
Pennsylvania	10.7	11.7	13.2	14.4	4.2	3.8	4.4	3.8
Rhode Island	11.0	12.2	11.9	14.0	0.4	0.3	0.4	0.3
South Carolina	10.6	12.7	10.8	13.1	1.1	1.3	1.1	1.1
South Dakota	14.6	15.5	18.1	17.4	0.3	0.3	0.3	0.3
Tennessee	12.6	15.1	13.8	16.7	1.9	2.1	1.9	2.2
Texas	14.8	15.8	17.5	17.0	7.6	8.1	8.2	7.9
Utah	15.6	14.6	16.5	17.0	0.7	0.8	0.8	0.9
Vermont	16.4	17.9	18.3	20.5	0.3	0.3	0.3	0.3
Virginia	11.2	12.3	12.0	13.7	2.3	2.3	2.3	2.3
Washington	13.5	13.2	16.4	16.7	2.1	2.0	2.3	2.2
West Virginia	11.7	12.2	14.2	15.0	0.6	0.5	0.6	0.5
Wisconsin	11.1	11.6	12.3	13.2	1.8	1.7	1.7	1.7
Wyoming	16.0	16.2	19.8	20.1	0.2	0.2	0.3	0.2

1 (Number of PIT returns with a Sch. C) / (Number of PIT returns).

2 (Sole proprietor employment) / (Total employment).

3 (Number of PIT returns with a Sch. C in state) / (Number of PIT returns with Sch. C in nation).

4 (Sole proprietor employment in state) / (Sole proprietor employment in nation).

Table 2: Fixed Effects Regressions: Entrepreneurial Stock and Statutory Tax Policy

Variable	Tax Return Measure	Employment Measure
Top Corporate Income Tax Rate	-0.055	-0.008
	(0.049)	(0.034)
Top Personal Income Tax Rate	0.075	-0.004
	(0.051)	(0.035)
Sales Tax Rate	0.165*	0.113*
	(0.098)	(0.068)
Sales Factor Apportionment	0.001	0.001
	(0.003)	(0.002)
Progressivity	0.248	0.505***
	(0.210)	(0.146)
Combined Reporting	0.673***	0.439***
	(0.181)	(0.126)
Throwback Rule	-0.112	0.280*
	(0.223)	(0.155)
Inheritance, Estate, and Gift	-0.111	-0.022
	(0.132)	(0.092)
LLC	0.185*	0.073
	(0.108)	(0.075)
Tax Incentives	0.030***	0.014*
	(0.011)	(0.008)
Non-Tax Incentives	0.016	-0.013*
	(0.010)	(0.007)
Homestead Exemption	-0.002	0.001
	(0.001)	(0.001)
Unlimited Homestead Exemption	0.026	0.035
	(0.283)	(0.198)
Unemployment Rate	0.078**	0.312***
	(0.039)	(0.027)
Median Income	-0.054***	-0.034***
	(0.015)	(0.010)
Poverty Rate	-0.020	-0.028**
	(0.015)	(0.011)
Population Density	0.011***	0.005*
	(0.004)	(0.003)
Job Growth Rate	0.007	0.090***
	(0.024)	(0.017)
Agricultural Share of GSP	0.064	0.125***
	(0.049)	(0.034)
Service Share of GSP	0.039	-0.027
	(0.044)	(0.031)
Manufacturing Share of GSP	-0.030	-0.051***
	(0.021)	(0.014)
State taxes per capita	-0.202	-0.154
	(0.178)	(0.124)
Local taxes per capita	0.502	0.331
	(0.333)	(0.232)
Constant	11.69***	13.77***
	(1.66)	(1.16)
R-squared	0.423	0.590

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Notes: Regressions include state and year fixed effects.

All percentages are on a 0-100 scale.

Median income, state and local taxes per capita, and homestead exemption are measured in thousands of current year dollars.

Table 3: Fixed Effects Regressions: Entrepreneurial Share and Statutory Tax Policy

Variable	Tax Return Measure	Employment Measure
Top Corporate Income Tax Rate	-0.004	0.0003
	(0.007)	(0.007)
Top Personal Income Tax Rate	-0.015**	-0.005
	(0.007)	(0.007)
Sales Tax Rate	-0.027**	-0.008
	(0.013)	(0.013)
Sales Factor Apportionment	-0.001**	-0.0003
	(0.0004)	(0.0004)
Progressivity	-0.017	-0.046
	(0.029)	(0.028)
Combined Reporting	0.053**	0.014
	(0.025)	(0.024)
Throwback Rule	-0.006	0.035
	(0.030)	(0.030)
Inheritance, Estate, and Gift	-0.050***	0.004
	(0.018)	(0.018)
LLC	-0.046***	-0.053***
	(0.015)	(0.015)
Tax Incentives	0.006***	0.003*
	(0.002)	(0.002)
Non-Tax Incentives	0.002	-0.010***
	(0.001)	(0.001)
Homestead Exemption	-0.0001	0.0002
	(0.0002)	(0.0002)
Unlimited Homestead Exemption	-0.011	-0.011
	(0.038)	(0.038)
Unemployment Rate	0.002	0.016***
	(0.005)	(0.005)
Median Income	-0.007***	-0.003
	(0.002)	(0.002)
Poverty Rate	-0.004**	-0.007***
	(0.002)	(0.002)
Population Density	0.001**	0.001
	(0.0005)	(0.001)
Job Growth Rate	0.002	0.002
	(0.003)	(0.003)
Agricultural Share of GSP	-0.009	-0.005
	(0.007)	(0.007)
Service Share of GSP	-0.015**	-0.003
	(0.006)	(0.006)
Manufacturing Share of GSP	-0.004	0.002
	(0.003)	(0.003)
State taxes per capita	-0.099***	-0.078***
	(0.024)	(0.024)
Local taxes per capita	0.002	-0.074*
	(0.045)	(0.045)
Number of PIT Returns	0.0002***	-
	(0.00003)	-
Population	-	0.0001***
	-	(0.00001)
Constant	2.33***	1.78***
	(0.23)	(0.22)
R-squared	0.797	0.933

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Notes: Regressions include state and year fixed effects.

All percentages are on a 0-100 scale.

Median income, state and local taxes per capita, and homestead exemption are measured in thousands of current year dollars.

Number of PIT Returns and population are in thousands.

Table 4: Fixed Effects Regressions: State Entrepreneurship and Tax Shares

Variable	Entrepreneurial *Stock*		Entrepreneurial *Share*	
	Tax Return	Employment	Tax Return	Employment
Corporate Income Tax Share	-0.023	-0.014	0.002	0.001
	(0.014)	(0.010)	(0.002)	(0.002)
Personal Income Tax Share	-0.011	-0.015*	-0.003	-0.003
	(0.013)	(0.009)	(0.002)	(0.002)
Sales Tax Share	-0.011	-0.012	-0.0003	0.0002
	(0.014)	(0.010)	(0.002)	(0.002)
License Tax Share	-0.007	-0.011	0.011	0.0004
	(0.050)	(0.035)	(0.007)	(0.007)
Unemployment Rate	0.059	0.285***	0.001	0.016***
	(0.039)	(0.027)	(0.005)	(0.006)
Median Income	-0.062***	-0.042***	-0.008***	-0.005**
	(0.014)	(0.010)	(0.002)	(0.002)
Poverty Rate	-0.018	-0.029***	-0.003	-0.006***
	(0.015)	(0.011)	(0.002)	(0.002)
Population Density	0.008**	0.005*	0.001	0.0002
	(0.004)	(0.003)	(0.001)	(0.001)
Job Growth Rate	0.007	0.083***	0.003	0.002
	(0.024)	(0.017)	(0.003)	(0.003)
Agricultural Share of GSP	0.038	0.117***	-0.010	-0.010
	(0.046)	(0.032)	(0.006)	(0.007)
Service Share of GSP	0.026	-0.028	-0.019***	-0.006
	(0.044)	(0.031)	(0.006)	(0.006)
Manufacturing Share of GSP	-0.032	-0.046***	-0.005*	-0.0002
	(0.021)	(0.014)	(0.003)	(0.003)
State Taxes per Capita	-0.158	-0.065	-0.060**	-0.026
	(0.176)	(0.123)	(0.024)	(0.025)
Local taxes per Capita	1.013***	0.526**	0.098**	-0.109**
	(0.322)	(0.225)	(0.045)	(0.046)
Number of PIT Returns	-	-	0.0002***	-
	-	-	(0.00003)	-
Population	-	-	-	0.0001***
	-	-	-	(0.00001)
Constant	14.43***	15.95***	10.93***	1.89***
	(1.52)	(1.06)	(0.210)	(0.216)
R-squared	0.392	0.568	0.888	0.950

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Notes: Regressions include state and year fixed effects.

All percentages are on a 0-100 scale.

Median income, state taxes per capita, and local taxes per capita are measured in thousands of current year dollars.

Number of PIT returns and population are in thousands.

Table 5: Fixed Effects Results: State Entrepreneurship and Effective Tax Rates

Variable	Entrepreneurial Stock		Entrepreneurial Share	
	Tax Return	Employment	Tax Return	Employment
Corporate Income Revenue/SPI	-0.066	0.084	0.026	0.026
	(0.140)	(0.097)	(0.018)	(0.019)
Personal Income Tax Revenue/SPI	-0.047	-0.005	-0.098***	-0.042**
	(0.156)	(0.108)	(0.021)	(0.021)
Sales Tax Revenue/SPI	0.132	-0.043	-0.010	-0.006
	(0.172)	(0.119)	(0.023)	(0.023)
License Tax Revnenue/SPI	-0.156	0.101	0.086	0.01
	(0.574)	(0.399)	(0.076)	(0.076)
Sales Factor Apportionment	0.001	0.001	-0.001***	-0.0004
	(0.003)	(0.002)	(0.0004)	(0.0004)
Progressivity	0.333	0.550***	-0.023	-0.044
	(0.207)	(0.144)	(0.027)	(0.028)
Combined Reporting	0.657***	0.428***	0.055**	0.014
	(0.181)	(0.126)	(0.024)	(0.024)
Throwback Rule	-0.135	0.276*	-0.009	0.035
	(0.223)	(0.155)	(0.030)	(0.030)
Inheritance, Estate, and Gift	-0.129	-0.050	-0.044**	0.004
	(0.133)	(0.092)	(0.018)	(0.018)
LLC	0.172	0.070	-0.040***	-0.049***
	(0.109)	(0.076)	(0.014)	(0.015)
Tax Incentives	0.029***	0.012	0.009***	0.004**
	(0.011)	(0.008)	(0.001)	(0.002)
Non-Tax Incentives	0.012	-0.014**	0.002	-0.010***
	(0.010)	(0.007)	(0.001)	(0.001)
Homestead Exemption	0.002	0.001	0.0004**	0.0003
	(0.001)	(0.001)	(0.0002)	(0.0002)
Unlimited Homestead Exemption	0.039	0.029	-0.005	-0.009
	(0.286)	(0.198)	(0.038)	(0.038)
Unemployment Rate	0.081**	0.309***	0.001	0.016***
	(0.039)	(0.027)	(0.005)	(0.005)
Median Income	-0.053***	-0.034***	0.006***	-0.002
	(0.015)	(0.010)	(0.002)	(0.002)
Poverty Rate	-0.016	-0.029***	-0.004*	-0.006***
	(0.016)	(0.011)	(0.002)	(0.002)
Population Density	0.010**	0.005*	0.001*	0.0005
	(0.004)	(0.003)	(0.001)	(0.001)
Job Growth Rate	0.008	0.089***	0.003	0.002
	(0.024)	(0.017)	(0.003)	(0.003)
Agricultural Share of GSP	0.072	0.122***	-0.009	-0.005
	(0.049)	(0.034)	(0.007)	(0.007)
Service Share of GSP	0.039	-0.030	-0.012*	-0.002
	(0.045)	(0.032)	(0.006)	(0.006)
Manufacturing Share of GSP	-0.037*	-0.054***	-0.001	0.002
	(0.021)	(0.015)	(0.003)	(0.003)
State Taxes per Capita	-0.127	-0.190	-0.077	-0.077**
	(0.228)	(0.158)	(0.030)	(0.030)
Local taxes per Capita	0.500	0.211	0.026**	-0.071
	(0.331)	(0.230)	(0.044)	(0.044)
Number of PIT Returns	-	-	0.0002***	-
	-	-	(0.00002)	-
Population	-	-	-	0.0001***
	-	-	-	(0.00001)
Constant	12.30***	14.57***	2.04***	1.71***
	(1.55)	(1.08)	(0.21)	(0.21)
R-squared	0.419	0.589	0.832	0.937

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Notes: Regressions include state and year fixed effects.

All percentages are on a 0-100 scale.

Median income, state and local taxes per capita, and homestead exemption are measured in thousands of current year dollars.

Number of PIT returns and population are in thousands.

Table 6: Fixed Effects Results: Statutory Tax Policy with Agricultural Entrepreneurship

Variable	Entrepreneurial Stock		Entrepreneurial Share	
	Tax Return	Employment	Tax Return	Employment
Top Corporate Income Tax Rate	-0.078	-0.028	-0.011*	-0.005
	(0.057)	(0.037)	(0.006)	(0.006)
Top Personal Income Tax Rate	0.086	-0.013	-0.008	-0.004
	(0.059)	(0.038)	(0.006)	(0.006)
Sales Tax Rate	0.151	0.077	-0.036***	-0.016
	(0.114)	(0.073)	(0.012)	(0.012)
Sales Factor Apportionment	0.002	0.002	-0.0004	-0.0002
	(0.003)	(0.002)	(0.0003)	(0.0003)
Progressivity	0.266	0.481***	-0.03	-0.052**
	(0.244)	(0.157)	(0.026)	(0.025)
Combined Reporting	0.469**	0.327**	0.050**	0.020
	(0.209)	(0.135)	(0.023)	(0.021)
Throwback Rule	-0.053	0.234	0.007	0.037
	(0.258)	(0.167)	(0.028)	(0.026)
Inheritance, Estate, and Gift	-0.093	-0.039	-0.046***	-0.0002
	(0.153)	(0.099)	(0.017)	(0.016)
LLC	0.175	0.070	-0.049***	-0.044***
	(0.125)	(0.081)	(0.014)	(0.013)
Tax Incentives	0.033**	0.012	0.005***	0.002
	(0.013)	(0.008)	(0.001)	(0.001)
Non-Tax Incentives	0.016	-0.007	0.001	-0.008***
	(0.011)	(0.007)	(0.001)	(0.001)
Homestead Exemption	-0.0005	0.002**	0.0002	0.0002
	(0.002)	(0.001)	(0.0002)	(0.0002)
Unlimited Homestead Exemption	0.481	0.450**	0.017	0.022
	(0.328)	(0.212)	(0.036)	(0.034)
Unemployment Rate	0.069	0.309***	0.004	0.016***
	(0.045)	(0.029)	(0.005)	(0.005)
Median Income	-0.078***	-0.034***	-0.009***	-0.003*
	(0.017)	(0.011)	(0.002)	(0.002)
Poverty Rate	-0.020	-0.014	-0.003*	-0.004**
	(0.018)	(0.012)	(0.002)	(0.002)
Population Density	0.015***	0.008***	0.002***	0.001
	(0.005)	(0.003)	(0.001)	(0.0005)
Job Growth Rate	-0.001	0.098***	0.003	0.005*
	(0.029)	(0.018)	(0.003)	(0.003)
Agricultural Share of GSP	0.328***	0.277***	0.004	0.003
	(0.057)	(0.037)	(0.006)	(0.006)
Service Share of GSP	0.057	-0.029	-0.012**	-0.003
	(0.051)	(0.033)	(0.006)	(0.005)
Manufacturing Share of GSP	-0.037	-0.058***	-0.003	0.003
	(0.024)	(0.016)	(0.003)	(0.002)
State Taxes per Capita	-0.318	-0.244*	-0.104***	-0.069***
	(0.206)	(0.133)	(0.022)	(0.021)
Local taxes per Capita	0.321	0.301	-0.006	-0.061
	(0.385)	(0.249)	(0.042)	(0.040)
Number of PIT returns	-	-	0.0003***	-
	-	-	(0.00002)	-
Population	-	-	-	0.0001***
	-	-	-	(0.00001)
Constant	14.12***	15.07***	2.14***	1.54***
	(1.92)	(1.24)	(0.21)	(0.020)
R-squared	0.367	0.480	0.768	0.926

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Notes: Regressions include fixed year effects.

All percentages are on a 0-100 scale.

Median income, state and local taxes per capita, and homestead exemption are measured in thousands of current year dollars.

Number of PIT returns and population are in thousands.

Table 7: Fixed Effects Results: Tax Shares with Agricultural Entrepreneurship

Variable	Entrepreneurial Stock		Entrepreneurial Share	
	Tax Return	Employment	Tax Return	Employment
Corporate Income Tax Share	-0.023	-0.012	0.001	0.001
	(0.017)	(0.011)	(0.002)	(0.002)
Personal Income Tax Share	0.008	-0.009	-0.002	-0.002
	(0.015)	(0.010)	(0.002)	(0.002)
Sales Tax Share	-0.003	-0.015	-0.0003	-0.0002
	(0.016)	(0.010)	(0.002)	(0.002)
License Tax Share	0.013	-0.020	0.017***	-0.0003
	(0.057)	(0.037)	(0.006)	(0.006)
Unemployment Rate	0.053	0.284***	0.004	0.016***
	(0.045)	(0.029)	(0.005)	(0.005)
Median Income	-0.091***	-0.046***	-0.010***	0.005***
	(0.016)	(0.011)	(0.002)	(0.002)
Poverty Rate	-0.017	-0.013	-0.002	-0.003*
	(0.018)	(0.012)	(0.002)	(0.002)
Population Density	0.013***	0.009***	0.001*	0.001
	(0.005)	(0.003)	(0.0005)	(0.001)
Job Growth Rate	0.003	0.095***	0.005	0.006*
	(0.029)	(0.019)	(0.003)	(0.003)
Agricultural Share of GSP	0.330***	0.287***	0.005	-0.001
	(0.053)	(0.034)	(0.006)	(0.006)
Service Share of GSP	0.038	-0.035	-0.014**	-0.004
	(0.051)	(0.033)	(0.006)	(0.006)
Manufacturing Share of GSP	-0.044*	-0.055***	-0.003	0.002
	(0.024)	(0.015)	(0.003)	(0.003)
State Taxes per Capita	-0.296	-0.191	-0.067***	-0.026
	(0.203)	(0.132)	(0.023)	(0.022)
Local taxes per Capita	0.689*	0.438*	0.085**	-0.089**
	(0.371)	(0.241)	(0.042)	(0.041)
Number of Tax returns	-	-	0.0002***	-
	-	-	(0.00002)	-
Population	-	-	-	0.0001***
	-	-	-	(0.00001)
Constant	16.46***	17.03***	2.03***	1.56***
	(1.74)	(1.13)	(0.20)	(0.19)
R-squared	0.343	0.453	0.839	0.933

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Notes: Regressions include fixed year effects.

All percentages are on a 0-100 scale.

Median income, and state and local taxes per capita are measured in thousands of current year dollars.

Number of PIT returns and population are in thousands.

Appendix 1: Summary Statistics

Variable	1989		2001	
	Mean	**Std.Dev.**	**Mean**	**Std.Dev.**
Schedule C Returns/Total Returns	13.10	2.00	14.17	1.73
Nonfarm Sole Prop. Emp./Total Nonfarm Emp.	14.81	2.75	16.19	2.35
Sch. C + Sch. F Returns/Total Returns	15.93	4.17	16.55	3.31
Sole Proprietor Emp./Total Emp.	16.72	3.69	17.64	2.80
Share Schedule C Returns	2.00	2.36	2.00	2.35
Share Proprietor Employment	2.00	2.36	2.00	2.24
Top Corporate Income Tax Rate	6.58	3.01	6.63	2.91
Top Personal Income Tax Rate	5.47	3.37	5.59	3.22
Sales Tax Rate	4.32	1.75	4.63	1.81
Corporate Income Tax Share	7.89	5.66	5.17	4.60
Personal Income Tax Share	27.73	15.87	32.41	17.93
Sales Tax Share	31.79	14.68	31.06	14.82
License Tax Share	1.18	2.72	1.37	4.09
Corporate Income Revenue/SPI	0.53	0.55	0.35	0.31
Personal Income Tax Revenue/SPI	1.81	1.04	2.30	1.24
Sales Tax Revenue/SPI	2.05	0.99	2.15	1.05
License Tax Revenue/SPI	0.08	0.21	0.10	0.34
Sales Factor Apportionment	36.71	15.21	43.22	22.56
Progressivity	0.50	0.46	0.24	0.24
Combined Reporting	0.22	0.42	0.28	0.45
Throwback Rule	0.48	0.50	0.46	0.50
Inheritance, Estate, and Gift Tax	0.50	0.51	0.26	0.44
LLC	0.04	0.20	1.00	0.00
Tax Incentives	10.47	1.82	8.61	6.13
Non-tax Incentives	5.49	2.09	12.56	7.99
Homestead Exemption (thousands)	50.0	54.9	73.2	68.2
Homestead Exemption Unlimited	0.16	0.37	0.12	0.33
Unemployment Rate	5.15	1.35	4.53	0.87
Median Income (thousands)	39.57	5.58	62.04	9.04
Poverty Rate	12.55	3.93	11.23	3.31
Population Density	165.3	234.7	184.0	252.9
Job Growth Rate (excluding farming)	2.31	1.37	-0.19	1.08
Job Growth Rate (including farming)	2.15	1.34	-0.21	1.05
Agricultural Share of GSP	2.85	2.56	1.91	1.40
Service Share of GSP	16.64	3.74	20.43	3.48
Manufacturing Share of GSP	18.44	7.47	14.30	5.72
State taxes per capita (thousands)	1.15	0.33	1.94	0.40
Local taxes per capita (thousands)	0.66	0.26	1.07	0.36

Note: All percentages are on a 0-100 scale.

Median income, state and local taxes per capita, and homestead exemption and measured in

thousands of current year dollars.

Appendix 2: Data Descriptions and Source Notes

Variable	Definition
Schedule C Returns/Total Returns	Federal tax returns with a schedule C as a share of total tax returns, by state. (1)
Sch. C + Sch. F Returns/Total Returns	Federal tax returns with a schedule C or F as a share of total tax returns, by state.(1)
Nonfarm Sole Prop. Emp./Total Nfarm Emp.	Nonfarm sole prop. employment as a share of total nonfarm employment in a state. (2)
Sole Proprietor Emp./Total Emp.	Sole proprietorship employment as a share of total employment in a state. (2)
Top Corporate Income Tax Rate	Highest marginal corporate income tax rate. (3)
Top Personal Income Tax Rate	Highest marginal personal income tax rate. (3)
Sales Tax Rate	General sales tax rate. (3)
Corporate Income Tax Share	Corporate income tax collections as a share of total tax collections in a state. (4)
Personal Income Tax Share	Personal income tax collections as a share of total tax collections in a state. (4)
Sales Tax Share	Sales tax collections as a share of total tax collections in a state. (4)
License Tax Share	Corporate license and fee collections as a share of total tax collections in a state. (4)
Corporate Income Revenue/SPI	Corporate income tax collections as a share of state personal income. (5)
Sales Tax Revenue/SPI	Sales tax collections as a share of state personal income. (5)
License Tax Revenue/SPI	Corporate license and fee collections as a share of state personal income. (5)
Sales Factor Apportionment	Weight given to sales factor in the corporate income tax apportionment formula. (3)
Progressivity	Change in avg. tax rate relative to $20,000 change in income. (Scaled by 10,000.) (6)
Combined Reporting	1 if a state has a combined reporting requirement. (3)
Throwback Rule	1 if a state has a throwback rule. (15)
Inheritance, Estate, and Gift Tax	1 if a state has an inheritance, estate, or gift tax. (13)
LLC	1 if a state allows LLCs. (7)
Tax Incentives	Number of tax incentive programs a state offers. (14)
Non-Tax Incentives	Number of non-tax incentive programs a state offers. (14)
Homestead Exemption	Dollar amount of home equity that is exempt from bankruptcy. (12)
Homestead Exemption Unlimited	1 if a state has an unlimited homestead exemption. (12)
Unemployment Rate	State unemployment rate. (8)
Median Income (thousands)	State median income. (8)
Poverty Rate	Percent of state population living below poverty line. (8)
Population Density	Population/square miles in a state. (9)
Job Growth Rate (excluding farming)	Growth rate in non-farm employment over previous year. (10)
Job Growth Rate (including farming)	Growth rate in total employement over previous year. (10)
Agricultural Share of GSP	State agricultural production as a share of total gross state product. (10)
Service Share of GSP	State service production as a share of total gross state product. (10)
Manufacturing Share of GSP	State manufacturing production as a share of total gross state product. (10)
State taxes per capita (thousands)	Total state tax collections per person. (11)
Local taxes per capita (thousands)	Total local tax collections in a state per person. (11)
Number of non self-employed firms.	Count of the number of firms in a state (excluding the self-employed). (16)

Notes:

1. Author's calculations based on data from *Statistics of Income Bulletin*, Internal Revenue Service, various years.

2. *Regional Economic Accounts*, Bureau of Economic Analysis, various years.

3. State Tax Handbook, Commerce Clearing House, various years.

4. Author's calculations based on data from *State Government Tax Collections*, U.S. Census Bureau, various years.

5. Author's calculations based on data listed in note 4 (tax collections) and note 8 (state personal income).

6. Author's calculations based on data listed in note 8 (median income) and note 3 (tax rates).

7. www.llcweb.com

8. *Statistical Abstract of the United States*, U.S. Census Bureau, various years.

9. Author's calculations based on data from data listed in note 8.

10. Author's calculations based on data from *Regional Accounts Data,* Bureau of Economic Analysis, various years.

11. Author's calculations based on data from note 4 (tax collections) and note 8 (population).

12. Elias, Renauer, and Leonard, various years.

13. Conway and Rork, 2003.

14. National Association of State Development Agencies, various years.

15. *State Tax Handbook*, Commerce Clearing House (various years) and various state revenue departments.

16. *Statistics of U.S. Businesses*, U.S. Census Bureau, various years.