PUBLIC POLICY AND BUSINESS CREATION IN THE UNITED STATES*

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Abstract

This paper empirically examines business starts and deaths in relation to U.S. public policy. Controlling for venture capital, economic conditions, bankruptcy laws, and other factors, and using the most recent U.S. state level census data which covers the 1995-2005(Q1) period, we find robust evidence of more business starts with 1-4 employees in states with fewer government transfers, lower taxation, and lower minimum wages. Transfers and subsidies are associated with fewer business deaths. The data indicate business starts with over 10 employees are unrelated to government subsidies and taxation but do show a strong negative relation with labor frictions. Apart from the quantity of business creation, proxies for the quality of entrepreneurial activities show government policy in a more favorable light in terms of a positive effect associated with government transfers and subsidies.

Keywords: Entrepreneurship, Venture Capital, Taxation, Labor Law, Bankruptcy, Public Policy

JEL Codes: L26, L50, K31, K35, G24

1. Introduction

The OECD (1996) and others have argued that entrepreneurship and innovation will facilitate economic growth and the competitive advantage of nations in the 21st century. Much evidence, albeit not all, indicates small high-tech companies contribute disproportionately to innovation and economic growth (the World Bank, 1994, 2002, 2004). Drivers of entrepreneurial activity have been extensively researched in the U.S. and internationally. Empirical evidence points to a number of factors, including market conditions, education, information, spillovers and agglomeration (Audretsch, 2007a,b; Audretsch and Feldman, 1996; Audretsch and Keilbach, 2007). Empirical evidence has likewise confirmed the role of personal bankruptcy laws to mitigate the cost of failure (Fan and White, 2003; Berkowitz and White, 2004, Armour and Cumming, 2008), taxation to minimize moral hazard and maximize the returns to entrepreneurship (Keuschnigg, 2004a,b; Keuschnigg and Nielsen, 2003, 2004a,b), and legal and institutional settings that protect property rights and mitigate the start-up costs and costs of failure (La Porta et al., 1999; Djankov et al., 2002; Glasear et al., 2004; Acemoglu and Johnson, 2005; Levine, 2005; Klapper et al., 2006; Chavis et al., 2009).

The growing awareness of the role for public policy in promoting entrepreneurship has led to increasing efforts for governments around the world to spur entrepreneurial activity and create the next Silicon Valley. The stimulation of entrepreneurship can occur through direct government subsidy programs and legislative changes. For example, The World Bank spent more than $US10 billion in 2001-2005 to promote small enterprises (Beck *et al*., 2008). These expenditures have reportedly grown with the economic crisis in 2008 and 2009 resulting from the financial meltdown in 2007, and the ensuing rise in government bailouts and taxes worldwide. In the U.S., government spending grew to over 45% of GDP during the recent economic crisis (Chantrill, 2009), a record level since WWII.

The increasing presence of government in stimulating entrepreneurial activity gives rise to a growing need to reexamine the role of public policy on entrepreneurial activity. What exactly is the effect of policies like bailouts and subsidies on stimulating entrepreneurial activity? How do other public policy tool mechanisms such as government transfers, and labor and bankruptcy laws influence the rate of business start-up activity?

In this paper we focus on testing the effect of three main public policy instruments on stimulating entrepreneurial activity. First, we consider the size of government. Measures of the size of government include government consumptions expenditure, transfers and subsidies, as well as social security payments. On one hand, we may conjecture that this should help entrepreneurial activity as subsidies help promote risk taking and social security payments lower the expected costs of failure. On the other hand, we may conjecture that subsidies and social security exacerbate effort related moral hazard costs, thereby worsening an entrepreneurial climate.

Second, we consider takings and discriminatory taxation. Our empirical measures include tax revenue, top marginal income tax rates, indirect tax revenue, and sales tax. Consistent with prior literature (Keuschnigg, 2004a,b; Keuschnigg and Nielsen, 2003, 2004a,b), we expect taxation to mitigate entrepreneurial activity.

Third, we consider labor laws and the labor environment. In particular, we study for labor focus on minimum wage legislation, the number of government employees and labor union density. We may conjecture that minimum wage legislation imposes more stringent costs on entrepreneurial start-ups, thereby reducing the number of start-ups. Similarly, states that have a large government sector offer employment opportunities that mitigate the incentives to become self-employed. Further, unions provide labor-friendly environments with active lobbying on behalf of employees but comparatively higher costs on firms, thereby diminishing the incentives for employees to become entrepreneurs and start their own firms.

Our measures of the size of government, takings and discriminatory taxation and labor laws and the labor environment are based on newly available indices described in Karabegovic and McMahon (2008). Importantly, these indices vary across states and over time. We match these data to the most recent (as at July 2009) census data on business starts and deaths in the U.S., which covers the 1995-2005(Q1) period. The data indicate robust evidence that business starts with 1-4 employees are promoted by fewer government transfers, lower taxation, and lower minimum wages. Transfers and subsidies help only insofar as they reduce the number of business deaths. For larger business starts with up to 19 employees, the most important policy mechanism is labor frictions, which are negatively associated with business starts. Overall, the data are strongly consistent with the view that a larger government sector does not stimulate but rather stifles business creation in terms of the overall number of new firms created.

Our findings are robust to assessment of business creation in terms of levels and rates of changes in levels, as well as assessment of business starts versus net changes in terms of business starts – deaths. Our empirical measures are based on state wide data, and robust to state fixed-effects regression specifications. Our analyses are robust to consideration of delayed impacts of policies, as well as controls for economic conditions, venture capital investment, bankruptcy laws and other factors. It is noteworthy that our data do confirm a positive impact of venture capital on business creation (consistent with Keuschnigg, 2004a,b; Samila and Sorenson, 2009) as well as a positive effect of lenient personal bankruptcy laws (consistent with Fan and White, 2003; Berkowitz and White, 2004).

As an extension to our analysis of the quantity of business creation, we further analyze the quality of business creation. Proxies for quality include subsequent years' venture capital levels (total dollar values and total numbers of deals) and patent counts in each state. The most robust result among the policy variables that might influence quality is that government transfers and subsidies are positively associated with entrepreneurial quality in terms of venture capital deals, venture capital dollars as well as patent counts. The results are thus broadly consistent with work on the number and quality of entrepreneurs in the U.S. (Parker Parker and van Praag, 2008).

Taken together, the data shed light on a number of implications for developing effective public policy towards entrepreneurship. Policy instruments can influence both the quantity and quality of new firms, and the impacts are not always in the same direction for any given instrument. Based on the data examined, government transfers and subsidies appear to facilitate higher quality entrepreneurial activity, just as lenient personal bankruptcy laws stimulate the number of new firms created. However, transfers and subsidies, takings and discriminatory taxation, and labor frictions all appear to stifle the numbers of new firms created.

This paper is organized as follows. Section 2 describes the new indices for government, taxation and labor, and the predicted effects on business creation. Section 3 introduces the data and provides summary statistics. Multivariate regression analyses are presented in section 4. Section 5 provides and extended discussion of the results, as well as acknowledges limitations and considers extensions. Concluding remarks follow in section 6.

2. Policy Instruments

In this section we examine and discuss the role of government transfers and subsidies, takings and discriminatory taxation, and labor policies in stimulating business creation. As well, we explain the construction of indices used to measure these policy instruments across each of the U.S. states and over time.

2.1. Government Transfers and Subsidies

Government transfers and subsidies have the potential to encourage entrepreneurial activity. Arguments in support of government transfers and subsidies stimulating entrepreneurship require that government is well informed. On one hand, if the government policymakers are well informed about the productivity across all current and potential future entrepreneurs, then redistributive policies with transfers and subsidies can be optimally designed to mitigate distortions (Keuschnigg and Nielsen, 2003). Transfers and subsidies not only redistribute between persons of different productivity but also in different states of nature (Boadway et al. 2004). Government policy can be used to bring effective education and training to an efficient level where private markets do not work well. Government policy can overcome capital gaps in financing entrepreneurs where investors face institutional constraints on financing entrepreneurship. Government transfers may also provide endowments to potentially skilled entrepreneurs to stimulate risk taking, and facilitate agglomeration and information sharing.

On the other hand, there are arguments against transfers and subsidies which for the most part are based on the premise that it is highly unlikely that government policymakers are well informed about productivity across all current and potential entrepreneurs in practice. As such, transfers and subsidies are more likely to create distortions. The composition of government transfers and subsidies may induce moral hazard and adverse selection costs that mitigate the quality and quantity of entrepreneurial activity, thereby encouraging inefficient business creation and continuation, while at the same time stifling efficient business creation.

At the end of the day, arguments on either side about whether transfers and subsides stimulate or stifle entrepreneurship can quickly become elevated to political rhetoric without empirical scrutiny. In this paper we empirically assess the impact of transfers and subsidies while acknowledging *a priori* that political ideology could lead us either way in terms of possible

impacts on business creation. We use a new index that measures that quantity of transfers and subsidies, and this index varies across each of the U.S. states and over time for 1995-2005. The index values are calculated using a mini-max formula: $(V_{max} - V_i)/(V_{max}-V_{min})*10$ where V_{max} is the largest value found for transfers and subsides per GDP in a state, V_{min} is the smallest, and V_i is the observation to be transformed. The calculation includes all years of data to all for comparisons over time and across states (for details, see Karabegovic and McMahon, 2008). The index definitions and values are summarized herein in section 3 below. The indices range from 0 to 10, where 10 is the least amount of government transfers and subsidies. The indices are a relative ranking.

Prior work that has used these indices (e.g. Sobel, 2008) assumes that the Karabegovic and McMahon (2008) indices measure the quality of government. Importantly, size does not equate to quality. A larger government section is not necessarily a bad one. Whether or not a greater presence of government it is bad or at least has bad effects on entrepreneurship is a matter worthy of empirical scrutiny. One cannot make this assertion before empirical testing.

In addition to government transfers and subsides, in our empirical tests we further consider the effect on business creation in relation to the size of government per GDP, as well as the amount of social security payments per GDP in each state. These variables are calculated in the same way as the index for government transfers and subsidies per GDP, and reported in section 3. On one hand, a greater government sector and social security payments may induce risk taking and entrepreneurial activity. On the other hand, it is plausible that the size of government and social security mitigates business creation as governments are more likely to pursue superfluous activity as they expand (Karabegovic and McMahon, 2008), thereby diminishing the entrepreneurial climate in a region. There are both protective and productive functions of government, and it is plausible that all of the state governments in the U.S. are at a sufficient size to perform the sufficient amount of both of these functions, and if so, this may imply that larger governments are more likely to pursue activities that are unrelated to stimulating business creation. Further, social security payments for retirement, disability insurance and the like that are mandated by the government reduce flexibility and freedom of contract, thereby potentially imposing terms that might otherwise be at an inefficient level and in turn stifling business creation. Below, these competing claims are assessed empirically with the use of different proxies for the effect of government in our empirical analyses.

2.2. Taxation

Taxation in the U.S. is progressive in the sense that higher earners pay higher tax rates. Theoretical work has well established the proposition that progressive taxation reduces the returns to entrepreneurship and induces entrepreneurial moral hazard (Keuschnigg and Nielsen, 2004). Of course, taxes which are at such a low level where the rule of law and other necessary elements are not in place to conduct economic activity, an increase in taxation can stimulate entrepreneurial activity. But as long as taxes are at a level to cover sufficiently productive and protective functions of government (which is likely the case in all of the U.S. states), progressive taxation lowers the marginal benefits to additional effort, reduces the returns to risk taking and generally stifles entrepreneurial activity.

The same mini-max index formula is used taxation as it was for government transfers described in subsection 2.1. In section 3, we report taxation index values for tax revenue / GDP, the top marginal tax rate, indirect tax revenue / GDP and sales tax revenue / GDP. Our index for the top marginal tax rate accounts for both the rate and the threshold value for which it applies (Karabegovic and McMahon, 2008). Total tax revenue accounts for various corporate and capital taxes not included in the other three components. Capital gains taxes are picked up in total tax revenues, and do not significantly differ across U.S. states (http://www.taxfoundation.org).

Note that taxation and government transfers and subsidies are not necessarily the opposite sides of the same balance sheet. However, there are many intergovernmental transfers that break the link between taxation and spending at the state level. Therefore, it is relevant to assess separately taxation and spending. Further, note that differences between corporate and income taxation can impact the choice between employment and entrepreneurship. Higher corporate taxes relative to income taxes are expected to be associated with lower levels of new business starts (Keuschnigg, 2003). We empirically assess the difference between corporate and income taxes in our empirical analyses.

2.3 Labor Frictions

Our third index focuses on labor laws and the labor environment. In particular, we study for labor focus on minimum wage legislation, the number of government employees and labor union density. On one hand, minimum wage legislation might create a social and economic

climate that is safe, equal and fair, thereby attracting a higher number and higher quality supply of labor. On the other hand, minimum wage legislation potentially discourages business creation as smaller firms have a diminished ability to afford low-skilled workers at the established minimum wage. Our index for minimum wage is based on the minimum wage per GDP per capita. GDP per capita is a proxy for the average productivity in a jurisdiction. A higher ratio of minimum wage to GDP per capita reflects a narrowing range of employment contracts that can be freely negotiated; for example, minimum wages at 1% [50%] of average productivity likely has a small [large] impact on business creation.

In addition to minimum wages, we assess the impact of government employment. On one hand, higher levels of government employment may create economic opportunities for entrepreneurs to start new firms and conduct business with government, particularly where government expenditures enable agglomeration, for example. On the other hand, higher levels of government employment may give rise to greater labor market competition in a state, thereby diminishing the ability of entrepreneurs to effectively start new businesses. Further, higher levels of government employment could give rise to crowding out of goods and services that might otherwise have been provided privately, thereby stifling business creation.

Unions comprise a third crucial element of labor policy. In principle, workers should have the right to join or form unions. Well functioning voluntary unions have the potential to enhance working conditions and improve the climate for creating new firms. But laws and regulations that mandate labor unions or the joining labor unions where workers would rather not potentially stifle business creation. Factors that affect labor union density in a state include laws and regulations, the size of government, manufacturing density and the size of rural versus urban population. Reliable data about the quality of unions across states and over time is difficult. The index of labor unions therefore focuses on overall union density, or the percentage of unionized workers in a state. Recent work empirically shows labor unions increase the cost of equity, as they decrease a firms operating flexibility (Chen et al., 2009), and as such we would expect fewer start-ups in regions with stronger union density.

The index values of each of the policy instruments summarized and described further below in section 3. Other pertinent data are summarized alongside these indices.

3. Data and Summary Statistics

3.1 Data

Table 1 reports the definition of all variables. We first collected from the U.S. Census Bureau a list of state level starts and deaths data for establishments with 1-4, 5-9 and 10-19 employees for the period from 1995 to 2005(Q1). The data includes annual births, birth rate, net change, and net rate of change of establishments for 50 states. The establishment data is measured at the first quarter of each year. For example, the U.S. establishment births of year t/t+1 are those businesses which have zero employment in the first quarter of the year t and positive employment in the first quarter of year t+1. Our sample includes 500 state year observations.

[Insert Table 1 About Here]

The main explanatory variables of interest in our model are the public policy variables summarized in section 2. These variables are created on a state-wide basis and matched to the state where the business is located. The policy variables are computed by the Fraser Institute (Karabegovic and McMahon, 2008). It is worth mentioning that there is a one-quarter lag between the business creation variables and public policy indices, since the former is computed at the end of the first quarter of each subsequent year but the latter is calculated for the calendar year. As a result, there might be a lead-lag relationship between the public policy indices and business establishment data considering the time needed for the economic policies to take effective. Below, we empirically assess this possibility to allow for an additional 1 year lag (over and above the 1 quarter lag) and find the results to be robust.

Also, we introduce a variable for the corporate income tax at both state and federal level, as well as homestead and personal property exemption to account for bankruptcy laws across states, and the number of venture capital deals as control variables. The corporate income tax rate is from the Tax Foundation, and the number of venture capital deals is from the MoneyTree Report prepared by PricewaterhouseCoopers and the National Venture Capital Association on a quarterly basis. The homestead and personal property exemption are from Berkowitz and White (2004), Fan and White (2003).

3.2 Summary Statistics

As indicated in Table 1, the average state level establishment births decrease substantially in the size of the business, varying from 9032 for business with 1-4 employees to 812 for that of establishment with more than 10 employees. The establishment birth rates reveal the same pattern, decreasing from 16.7% to 6.2%. The average establishment change, which considers both births and deaths, is 851 for size 1-4 business, while the total establishments for size 10-19 business seldom changes, with a an average of 4.

The public policy indices include 3 primary indices: 1) Size of Government index; 2) Takings and Discriminatory Taxation index; and 3) Labor Index. Size of Government index measures the government intervention in the economy, consisting of 3 sub-indices measuring the government consumption expenditures (Size of Gov. Index_1A), transfers and subsidies (Size of Gov. Index_1B) and the social security payments as a percentage of GDP (Size of Gov. Index_1C), respectively. Takings and Discriminatory Taxation index is comprised of sub-indices which measure the four aspects of tax revenues, including the top marginal income tax rate and the income threshold at which it applies (Takings and Dis. Tax Index_2B), and the total tax revenues (Takings and Dis. Tax Index_2A), the indirect tax revenue (Takings and Dis. Tax Index_2C) and the sales taxes (Takings and Dis. Tax Index_2D) collected as a percentage of GDP. The Labor Index evaluates the minimum wage legislation (Labor_Index_3A), government employment as a percentage of total state/provincial employment (Labor_Index_3B) and union density (Labor_Index_3C). Each index is a weighted average of its sub-indices. Therefore, all indices and sub-indices have a scale from 0 to 10, with a high score indicating a smaller role for government intervention.

As presented in Table 1, the Size of Government index varies from a low value of 4.2 (West Virginia in 2002) to a high of 9.1 (Delaware from 1997 to 2000), with an average of 7.15. Among its 3 sub-indices, both Size of Gov. Index_1A and Size of Gov. Index_1B have values similar to that of the Size of Government index, while the average Size of Gov. Index_1C is much lower, with a value of 5.56. The Takings and Discriminatory Taxation index is relatively lower. Its average is equal to 5.72, varying from 3.70 (Maine in 1998) to 8.60 (Delaware in 2004). Among its 4 sub-indices, Takeings_and_Discim_Tax_2D is the largest with an average value of 7.38, while the other 3 sub-indices vary from 4.89 to 5.63. Similarly, the mean Labor Index is 6.97, with a minimum of 5.5 (Hawaii in 1997 and 1998) to a maximum of 8.1 (North

Carolina in 1999 and 2004). Its sub-index takes a value from a low of 6.25 (Labor Index_3C) to 7.62 (Labor Index_3B).

Table 2 provides comparison of means and medians tests of U.S starts and deaths data for establishments in relations to different levels of the three major policy indices. For each index, the whole sample is classified into High or Low group based on whether the index value is higher or lower than its median. We then compute the mean and median value for both groups and test whether there is statistically difference between them.

[Insert Table 2 About Here]

Table 2 Panel A reports the comparison results of Establishment Births per thousand population for the full sample of all state-years. The mean and median differences are positive significant at 1% for the high and low Labor Index groups for all business sizes, except that the mean different test for size 1-4 business significant at 5% level. This suggests that a higher Labor Index helps to increase business starts. As for the Size of Government index, only size 10-19 business sees a statistic difference between the high and low groups, significant at 5% for mean test and 1% for median test, respectively. The Establishment Births seems indifferent to the Takings and Dis. Tax Index, considering that the median test is significant at 10% only for size 5-9 business. Panel B summarizes the test results of Establishment Birth Rate for the full sample of all state-years. For all three indices, the average Establishment Birth Rate of both groups are statistically different at 5% level for all business sizes, implying that less government intervention encourages higher rate of new business starts. The median test results shows that higher Takings and Discriminatory Taxation index and Labor Index contribute to the Establishment Birth Rate, while the Size of Government index only matters for small business with 1-4 employees. Panel C and D report the test results of Establishment Net Change per thousand population and Net Rate of Change for the full sample of all state-years. Similarly, both mean and median test confirm that higher Takings and Dis. Tax Index and Labor Index contribute to the absolute and relative net change of establishment for all business sizes. However, Size of Government index seems to only matter for business with 1-4 employees.

Table 2 Panel E presents comparison tests for the number of venture capital deals and patents. The data indicate that smaller government (a higher index) is associated with lower levels of both venture capital deals and patents, and these differences are significant at the 1%

level. Note that this result is the exact opposite of that reported in Sobel (2008), and the reason for this difference is that in this paper we consider both cross-state differences as well as the time dimension in the data, while Sobel only considers cross-state differences for a single year. Venture capital and patents are highly volatile from one year to the next, and as such, to accurately assess policy one needs to consider a large number of years and not judge policy on the basis of a single year. (Actually, Sobel, 2008, does not report difference tests and aggregates different measures of the size of government together and only reports regression coefficients, do it is difficult to ascertain whether the results for the single year considered would actually materialize in the summary statistics. Regardless, in this paper we consider a full set of available years in the data.) Difference tests in Panel E are insignificant for taxation for venture capital deals and patents. For the labor index, however, higher values of the index (lower minimum wages and the like) show higher levels of venture capital deals and patents, and these differences are significant at the 1% level for venture capital and the 10% level for patents. Below, we assess in with the use of panel data regressions whether these results hold in a multivariate setting.

Table 3 presents a correlation matrix for the main variables used in the multivariate tests provided in the next section. The correlations are consistent with the comparison tests in Table 2 discussed above. But as we can see in Table 3, there is a strong positive correlation between the three major public policy indices, which varies from 0.34 to 0.47. The next section explores these relationships further in a multivariate context and with consideration to collinearity and causality issues, among other things.

[Insert Table 3 About Here]

4. Regression Analyses

4.1. Quantity of Business Creation

Our regression analyses for the quantity of new business creation are presented in Table 4. Below in subsection 4.2 we extend our analysis by examining various proxies for the quality of business creation.

In Table 4 we use standard OLS regressions with state fixed-effects regressions to account for differences across states that are not picked up by our time-varying policy variables

of interest. We present 10 different model specifications to highlight robustness. Model 1 considers factors that affect the level of business starts with 1-4 employees relative to the population in the state. The key explanatory variables are GDP / population, the size of government index 1B: transfers & subsidies / GDP, takings and discriminatory taxation index 2A: tax revenue / GDP, labor index 3A: minimum wage legislation, CIT state and federal taxes, the number of venture capitals deals / population. Model 2 is similar to Model 1 but instead considers factors that affect the rate of change in business starts with 1-4 employees / population, with adjustments to the explanatory variables to study rates of change. Model 3 is analogous to Model 1 but considers lead values of the dependent variable by 1 year and 1 quarter (instead of just 1 quarter as in Model 1). Model 4 is analogous to Model 1 but considers firm births – deaths instead of just firm births. Model 5 is the rate of change in firm births – deaths.

[Insert Table 4 About Here]

Models 6-10 consider dependent variables for new firm starts / population. Model 6 provides dependent variables analogous to Model 1, with the exception of using the time invariant bankruptcy index and state dummy variables (48 states with one state dropped to avoid perfect collinearity) instead of state fixed effects. Model 7 uses in each of the different policy indices defined in Table 1 and described above in section 2. Models 8-10 use the variables for public policy that are aggregated (on an equal weighted basis) across each of the subcomponents of the size of government, takings and discriminatory taxation and labor index. Models 8, 9 and 10 differ by considering the birth rate for firms with 1-4, 5-9 and 10-19 employees, respectively. All of the models exhibit high adjusted R^2 values.

The average [median] birth rate (1-4 employees) / population in our sample is 0.00168 [0.00160]. The effect of the size of government index 1B: transfers and subsidies / GDP is statistically significant at the 1% level and economically large. The coefficient of 5.359E-05 means that a 1 standard deviation change in the 1B index (0.93; see Table 1) increases the new business starts with 1-4 employees by 4.867E-05, which is an increase of 2.89% in business stats per population. The effect of takings and discriminatory taxation is likewise positive and statistically significant. The coefficient of 8.854E-05 means than a 1 standard deviation change in the 2A index (1.18; see Table 1) increases new business starts with 1-4 employees / population by 1.030E-04, which is an increase of 6.13% in business starts per population. Finally, the effect of minimum wages is positive and statistically significant as well. The coefficient of 5.011E-05

means that a 1 standard deviation change in the 3A index (1.36; see Table 1) increases new business starts with 1-4 employees / population by 6.815E-05, which is an increase of 4.05% in business starts / population. In other words, smaller levels of transfers and subsidies are associated, lower levels of taxes, and lower minimum wage legislation relative to GDP per capita are all strongly associated with more business starts.

The importance of taxes is similarly reflected in the differences between corporate and income taxes, which impacts occupation choice. Higher corporate taxes relative to income taxes skews preferences towards employment as opposed to entrepreneurship (Keuschnigg, 2003). The size of the effect is that a one standard deviation change (0.026) in differences in taxes gives rise to a reduction in new business starts by 2.28%.

The results in Model 1 hold for control variables for state and federal taxes rates, as well as GDP / population, and the number of venture capital deals / population. The GDP / population variable is negative and significant and the venture capital deals / population variable is positive and significant. Low income in terms of GDP per capita drives more people to start new businesses to create opportunities for themselves (consistent with Thurik et al., 2008). A greater presence of venture capital activity likewise inspires entrepreneurs to create new firms (see also Samila and Sorenson, 2009). Further, we stress that the results are robustness to state fixed effects to pick up factors not controlled for the in regressions but which might systematically differ across states.

Model 2 assesses the robustness of the results to rates of change rather than levels. All of the results in Model 2 support Model 1, with the sole exception of the labor index which is insignificant in Model 2 but positive and significant in Model 1. Also, the variable for the change in the venture capital deals / population is insignificant in Model 2, while the effect of venture capital was positive and significant in Model 1. In terms of the economic significance, a 1 standard deviation increase in the index value for 1B government transfers and subsidies / GDP causes a 23.07% increase in the rate of change in business starts.

Model 3 assesses the robustness of the results to leading the dependent variable by 1 year and 1 quarter, as opposed to just 1 quarter (as in Model 1). The results are robust in terms of both the economic and statistical significance for takings and discriminatory taxation index 2A and the labor index 3A. The other variables in Model 3, however, are insignificant.

Model 4 assesses the robustness of the results to using as the dependent variable births – deaths. Again, we find that takings and discriminatory taxation index 2A and the labor index 3A are positive and significant, but the transfers and subsidies index is insignificant. The differences between Models 1 and 4 imply that transfers and subsides (index 1B) have a significant impact on mitigating the overall level of firm deaths. However, when we examine rates of changes of births – deaths in Model 5, transfers and subsidies index 1B is positive and significant while the others are insignificant. It is difficult to account for this last result, other than the possibility that business deaths can be prolonged due to various factors (Bergström et al., 2005).

Models 6-8 consider the robustness of the results in Model 1 to the use of different explanatory variables. In Model 6 we use a bankruptcy variable for the homestead exemption, which does not vary over time, and state dummy variables (dropping 1 state to avoid collinearity). The results are quite similar to Model 1. The estimates impact of bankruptcy homestead exemption is large: a 1 standard deviation increase in the exemption level ($55,153 as indicated in Table 1) is associated with a 9.96% greater number of business starts with 1-4 employees / population. The importance of entrepreneur-friendly bankruptcy laws has been shown in prior work with U.S. data (Fan and White, 2003; Berkowitz and White, 2004).

Model 7 uses each of the subcomponents indices to compare the effects of different policy instruments. Generally, the significant indices are the ones reported in the earlier specifications: 1A transfers and subsidies / GDP, 2A: tax revenue / GDP, and 3A: minimum wage. The government employment index 3B is also significant, but only at the 10% level of significance. The economic significance is such that a 1 standard deviation increase in index 3B increases the number of business starts / population by 6.29%.

Models 8, 9 and 10 use as explanatory variables the aggregate index values for that equally weight each of the sub indices for explaining births / population with 1-4, 5-9 and 10-19 employees, respectively. Model 8 for births 1-4 employees / population shows all of the three policy indices are significant at at least the 5% level of significance. Model 9 for births 5-9 employees / population shows the size of government index is significant at the 1% level, and the labor index is significant at the 10% level. Model 10 for births with 10-19 employees shows the only index that is significant is the labor index, which is significant at the 1% level. These three models highlight the difference of policy instruments on starts with differing numbers of

employees. Policies pertinent to labor have a greater impact on starts with a greater number of employees, as one would expect. By comparison, transfers, subsidies and taxation are more important for the smallest new firms.

Overall, the regressions are consistent with our summary statistics and consistently show that greater index values for size of government transfers, taxation and minimum wages are associated with a reduction in business creation. Various other regressions were considered and showed similar results. Alternative specifications not explicitly presented are available on request.

4.2. Quality of Business Creation

To complement our analyses of the total number of new firms created, in this subsection we examine whether policy has an impact on the quality of entrepreneurial activity. Table 5 reports OLS regressions for the number and dollar values of venture capital per population, as well as patents per population. The dependent variables are measured on an aggregate state-wide basis. We use state fixed effects to account for state differences not picked up by the explanatory variables modeled. The explanatory variables are lagged by 1 year, with the exception of GDP per capita which is reported for contemporaneous values (and lagging this variable by 1 period is immaterial to the results of interest). There are 500 state-year observations, and adjusted R^2 values are quite high.

[Insert Table 5 About Here]

In Models 11 and 12, the dependent variable is venture capital deals / population, and different explanatory variables are reported to show robustness. Models 11 and 12 show a negative coefficient for size of government transfers and subsidies, and these results are significant at the 5% and 1% levels, respectively. The economic significance in Model 11 is such that a 1 standard deviation change in the government transfers and subsides index gives rise to a 8.13% reduction in the number of venture capital deals / population (and the size of this effect is a 27.31% reduction in Model 12). Similarly, in Model 13 for the dollar value of venture capital deals, and in Models 14 and 15 for the number of patents, the effect of size of the size of government transfers and subsidies is significant at the 1% level, and shows and 1 standard deviation increase in the index reduces the dependent variable in Models 13, 14 and 15 by 64.1%,

15.3% and 15.1%, respectively. As the index is defined such that more transfers and subsidies are associated with lower values of the index, this means transfers and subsidies are consistently associated with higher values of our proxies for the quality of entrepreneurial activity.

It is noteworthy that the data show transfers and subsidies are associated with fewer new business starts in the prior subsection, but higher quality entrepreneurs in this subsection. The evidence is consistent with prior theoretical work that unfettered markets, such as those in the U.S., produce too many low quality entrepreneurs (Parker and van Praag, 2008).

Note in Models 12, 13 and 15 that social security payments are associated with lower levels of entrepreneurial quality. Further, in Models 11-13, government employment / total employment is associated with lower levels of entrepreneurial quality, but this effect is not significant in Models 14 and 15. Likewise, indirect tax revenue is a significant factor in some of the models, but the significance and the sign of the effect are not robust across any of the specifications.

The control variables in Table 5 are consistent with prior work. Venture capital levels are positively related to recent prior start-up activity in Models 12 and 13 (although this effect is not significant in Model 11). Start-up activity is not positively related to new firm patents in Models 14 and 15, but we would not expect all new firms to be able to patent at an early stage or there may be delays in innovations after new firms start, and not all innovations take place in new firms (e.g., Cassiman and Ueda, 2006). Models 14 and 15 show and negative relation between firm starts with more employees and patent activity, which suggests new firms with greater numbers of employees are less likely to be innovative firms and more likely manufacturing firms; this interpretation is consistent with the results in Table 4 that show start-up firms with more employees are more sensitive to labor regulations such as minimum wages. Finally, prior recent patent activity encourages new venture capital investment (Models 11-13), just as prior recent venture capital activity spurs new innovation (Models 14 and 15), consistent with related work showing dual causality between venture capital and patents (Ueda and Hirukawa, 2008). We note collinearity between venture capital dollars and venture capital deals in Models 14 and 15 gives rise to the negative significant coefficient for venture capital dollars; but regardless, inclusion or exclusion of one or the other venture capital variable does not materially impact any of the other variables pertaining to the tested hypotheses.

5. Discussion

The evidence in section 4 is in sharp contrast to the findings in Sobel (2008), particularly in relation to the effect of government on venture capital and start-up activity. The reason for these differences is as follows. First, Sobel (2008) assumes a larger government is one of lower quality. The Karabegovic and McMahon (2008) indices used in this paper and in Sobel (2008) measure the size of government, not the quality. Size does not imply quality. Second, we examine the empirics with time-series and cross-sectional data, while Sobel (2008) examines only cross-section data without considering differences over time. Time series changes reveal important relationships between the variables, and it is widely regarded that panel datasets should not be estimated as cross-sectional datasets.

There are two other papers on related topics that are worth mentioning in this context. First, Gohmann et al. (2008) consider time series and state variation but with different dependent pertaining to service industries, as well as different independent variables. Campbell and Rogers (2007) examine an issue that is closer related to Sobel (2008) and this paper, but do not consider time series changes in index values, and restrict their analysis to business starts without examining business starts by different numbers of employees, and do not analyze patents or venture capital activity. Further, in the analyses of Sobel (2008) and Campbell and Rogers (2007), all types of governmental activity are considered to be weighted the same and only a single index value is used. In this paper, we theoretically and empirically showed that different components of government intervention have different effects on the quantity and quality of entrepreneurship. Therefore, our approach herein differs first in terms of the theoretical position that larger governments are not necessarily of lower quality, and second in terms of the empirical execution by making use of time series and cross sectional variation in the panel data.

Our regression analyses in section 4 considered a variety of robustness checks. Of course, there are other policy instruments to stimulate entrepreneurship, such as public loan guarantees (Li, 2002), education differences, as well as other economic factors such as agglomeration that could explain state level different in business creation. In our specifications we used state fixed effects to pick up state differences not captured in the policy variables considered. Further work could explore differences in other factors and over time to understand the relative importance of variables not explicitly measured herein.

In our empirical analyses we study the period from 1995 to 2005(Q1). We considered subperiods within these dates and found the results to be robust. Our analyses are based on the most recent data available from the U.S. census (as at June 2009). Whether the results apply to the current economic crisis will only be known where the U.S. census releases new data in futures years.

In the analysis of the influence of government transfers on business starts, we do not limit ourselves to the narrowly defined policies, which is directly related to governmental support for certain firms, such as directed government venture capital programs. On the contrary, we examine the broad transfer payment, which is more reasonable considering that we are looking at the aggregated measures of start-ups. Whether the effect is mainly driven by the aggregated level state policies or the direct support to new starts could be an interesting question for future research.

In this paper we do not make claims about welfare effects (see, e.g., Schumpeter, 1934; Baumol, 1990; North, 1990). In related theoretical work, Keuschnigg and Nielsen (2003) find that nonredistributive taxes have neutral welfare implications, while progressive taxes always impair entrepreneurship and the effect on welfare is positive or zero, depending on the specification of incentives in the model. Similarly, Sobel (2008) and others discuss the role of policy in influencing proxies for the quality of entrepreneurship, but this analysis is not based on time series changes in public policies and rather cross sectional analyses across states. As well, prior work has not fully measured the effects of entrepreneur related policy changes on overall societal welfare. Further, in this paper we do not distinguish between different types of entrepreneurship, such as by race or gender. Our analyses are based on U.S. Census data on overall business starts and deaths. Recent work with survey data from the Kauffmann foundation examines entrepreneurship by race and gender (Fairlie, 2009; Fairlie and Robb, 2009; Fairlie et al., 2009; Cole and Mehran, 2009).

In this paper we limit ourselves to the narrow question of how public policy affects business creation in terms of births and deaths, and the change in births and deaths over time, and proxies for entrepreneurial quality in terms of venture capital and patents. Ideally, we would like to be able to track what happened with these new firms that started up in response to policy changes, and how measures of overall state welfare changed in response to policy changes.

These questions are beyond the scope of our current data, but would be an interesting avenue for future research.

6. Conclusions

This paper empirically examines the relation between business starts and deaths in relation to U.S. public policy using the most recent (as at 07/2009) U.S. state level census data which covers the 1995-2005(Q1) period. The data strongly indicate robust evidence of a greater number of business starts with 1-4 employees in states with fewer government transfers, lower taxation, and lower minimum wages. Transfers and subsidies are statistically associated with fewer business deaths. Business starts with a greater number of employees are less connected to government transfers and taxation and more directly related to labor laws. These findings are robust to various controls with different econometric specifications including state fixed effects, controls for economic conditions, venture capital investment, bankruptcy laws and other factors.

In addition to these analyses of the quantity of new business creation, we further examined the quality of entrepreneurial activity with proxies such as subsequent venture capital deals and patent counts. The data examined indicate government transfers and subsidies appear to play a more positive role by stimulating entrepreneurial quality.

The policy implications from the empirical analysis are straightforward. New business starts for the smallest firms are discouraged by a greater presence of the government sector. Larger start-ups, particularly those firms starting with more than 10 employees, are more closely connected to labor policies, not government transfers and taxation. Lenient personal bankruptcy laws, by contrast, stimulate entrepreneurial activity. Higher corporate taxes relative to income taxes reduces new business starts. Policy instruments not only influence the quantity of entrepreneurial activity but also the quality. The data indicate government transfers and subsidies appear to facilitate higher quality entrepreneurial activity. Other policy instruments including taxation and labor frictions, however, reduce the quality of entrepreneurial activity.

In this paper we do not consider overall welfare impacts of these policies. Rather, we only empirically study business starts and deaths, and proxies for the quality of entrepreneurial activity. Future work could use the new policy indices presented here in conjunction with other

data to enable analyses of policy changes on more broadly based welfare implications associated with business creation.

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Table 1. Variable Definitions and Summary Statistics

This table defines the variables used in the empirical analyses, as well as provides the source and descriptive statistics. The data span the period 1995-2004. The dependent variables are measured from the second quarter in a given year (t) to the first quarter in the subsequent year (t+1), so that the final observation is for 2005Q1. The independent variables are measured over the calendar period. The data cover all 50 U.S. states, so the number of observations is 500.

Variable	Definition	Source	Mean	Median	Std Dev	Min	Max
Dependent Variables							
U.S. Establishment Births for Size 1-4	The U.S. establishment births of year t/t+1 is the numbers of physical locations, where business is conducted, or services or industrial operations are performed, which have zero employment in the first quarter of year t and 1 to 4 employment in the first quarter of year t+1.	http://www.census.gov	9032	5624	10370	917	61974
U.S. Establishment Births for Size 5-9	The U.S. establishment births of year t/t+1 is the numbers of physical locations, where business is conducted, or services or industrial operations are performed, which have zero employment in the first quarter of year t and 5 to 9 employment in the first quarter of year t+1.	http://www.census.gov	1659	1190	1883	147	11531
U.S. Establishment Births for Size 10-19	The U.S. establishment births of year t/t+1 is the numbers of physical locations, where business is conducted, or services or industrial operations are performed, which have zero employment in the first quarter of year t and 10 to 19 employment in the first quarter of year t+1.	http://www.census.gov	812	568	947	68	7017
U.S. Establishment Birth Rate for Size 1-4	The U.S. establishment birth rate of year t/t+1 is the U.S. establishment births for size 1-4 of year t/t+1 divided by the U.S. initial year establishments for size 1-4.	http://www.census.gov	16.7%	16.2%	2.6%	11.4%	26.8%
U.S. Establishment Births Rate for Size 5-9	The U.S. establishment birth rate of year t/t+1 is the U.S. establishment births for size 5-9 of year t/t+1 divided by the U.S. initial year establishments for size 5-9.	http://www.census.gov	8.0%	7.8%	1.6%	5.0%	15.8%
U.S. Establishment Births Rate for Size 10-19	The U.S. establishment birth rate of year t/t+1 is the U.S. establishment births for size 10-19 of year t/t+1 divided by the U.S. initial year establishments for size 10-19.	http://www.census.gov	6.2%	5.8%	1.6%	3.4%	12.8%
U.S. Establishment Change for Size 1-4	The U.S. establishment change for size 1-4 of year t/t+1 is the difference of the total establishment for size 1-4 of year t+1 and year t .	http://www.census.gov	851	384	1621	-3874	15321
U.S. Establishment Change for Size 5-9	The U.S. establishment change for size 5-9 of year t/t+1 is the difference of the total establishment for size 5-9 of year t+1 and year t .	http://www.census.gov	152	74	279	-437	2322
U.S. Establishment Change for Size 10-19	The U.S. establishment change for size 10-19 of year t/t+1 is the difference of the total establishment for size 10-19 of year t+1 and year t .	http://www.census.gov	4	2	130	-948	1067
U.S. Net Establishment Rate of Change for Size 1-4	The U.S. net establishment rate of change for size 1-4 of year t/t+1 is the U.S. establishment change for size 1-4 of year t/t+1 divided by the U.S. initial year establishments for size 1-4.	http://www.census.gov	1.54%	1.42%	1.86%	-5.53%	7.96%
U.S. Net Establishment Rate of Change for Size 5-9	The U.S. net establishment rate of change for size 5-9 of year t/t+1 is the U.S. establishment change for size 5-9 of year t/t+1 divided by the U.S. initial year establishments for size 5-9.	http://www.census.gov	0.76%	0.67%	0.92%	-1.76%	5.37%
U.S. Net Establishment Rate of Change for Size 10-19	The U.S. net establishment rate of change for size 10-19 of year t/t+1 is the U.S. establishment change for size 10-19 of year t/t+1 divided by the U.S. initial year establishments for size 10-19.	http://www.census.gov	0.12%	0.03%	0.93%	-2.82%	3.88%

Table 1 (Continued)

Variable	Definition	Source	Mean	Median	Std Dev	Min	Max
Independent Variables							
Size of Gov. Index_1A: Gov Consumption/GDP	This index measures the general consumption expenditures by government as a percentage of GDP. It decreases in government spending. The index ranges from 0 to 10, and decreases in government spending.	http://www.freetheworld.com	7.39	7.59	1.17	3.50	10.00
Size of Gov. Index_1B: Transfers & Subsidies/GDP	This index measures the transfers and subsidies as a percentage of GDP. The index ranges from 0 to 10 with a higher score indicating a lower level of transfers and subsidies.	http://www.freetheworld.com	8.51	8.78	0.93	3.20	9.89
Size of Gov. Index_1C: Social Security Payments/GDP	This index measures the social security payments as a percentage of GDP. The index ranges from 0 to 10 with a higher score indicating a lower payment.	http://www.freetheworld.com	5.56	5.73	1.18	0.00	7.84
Size of Gov. Index, Combining 1A/1B/1C	The index measures the government intervention in the economy as an equal-weighted average of its three components: size_of_gov_1A, size_of_gov_1B and size_of_gov_1C. The index has a scale from 0 to 10, with a high score indicating a smaller government sector.	http://www.freetheworld.com	7.15	7.20	0.91	4.20	9.10
Takings and Dis. Tax Index_2A:Tax Revenue/GDP	This index measures the total tax revenues as a percentage of GDP. The index ranges from 0 to 10 with a high score indicating a lower percentage.	http://www.freetheworld.com	5.63	5.64	1.18	2.93	10.00
Takings and Dis. Tax Index_2B:Top Marginal Income Tax Rate	This index measures the top marginal income tax rate and the income threshold at which it applies. The index ranges from zero to 10 with a high score indicating a lower rate.	http://www.freetheworld.com	4.89	5.00	1.18	3.00	8.00
Takings and Dis. Tax Index_2C:Indirect Tax Revenue/GDP	This index measures the Indirect tax revenue as a percentage of GDP. The index ranges from 0 to 10 with a higher score indicating a lower rate.	http://www.freetheworld.com	4.97	5.19	1.61	0.49	9.03
Takeings_and_Discim_Tax_2D: Sales Taxes/GDP	This index measures the sales taxes collected as a percentage of GDP. The index ranges from 0 to 10 with a higher score indicating a lower rate.	http://www.freetheworld.com	7.38	7.37	1.05	4.48	9.85
Takings and Dis. Tax Index, Combining 2A/2B/2C/2D	The index measures the general tax revenues collected by government as an equal-weighted average of its four components: Takeings_and_Discim_Tax_2A, Takeings_and_Discim_Tax_2B, Takeings_and_Discim_Tax_2C and Takeings_and_Discim_Tax_2D. The index has a scale from 0 to 10, with a higher score indicating a lower degree of takings and discriminatory taxation.	http://www.freetheworld.com	5.72	5.80	0.77	3.70	8.60

Table 1 (Continued)

Variable	Definition	Source	Mean	Median	Std Dev	Min	Max
Independent Variables							
Labor Market Index 3A: Min Wage Legislation	This index measures the minimum wage legislation, calculated as the annual income earned by someone working at the minimum wage as a ratio of per-capita GDP. The index ranges from 0 to 10 with a high score indicating a lower ratio.	http://www.freetheworld.com	702	7.05	0.89	4.56	9.24
Labor Market Index 3B: Gov. Employment/Total Employment	This index measures the government employment as a percentage of total state employment. The higher the percentage, the lower the index. The index ranges from 0 to 10 with a high score indicating a lower ratio.	http://www.freetheworld.com	7.62	7.94	1.36	3.07	9.80
Labor Market Index 3C: Union Density	This index measures the union density, calculated as the percentage of unionized workers in a state after adjusting the influence of government employment, the size of the manufacturing sector and size of the rural population. The higher the ratio, the lower the index. The index ranges from 0 to 10 with a high score indicating a lower ratio.	http://www.freetheworld.com	6.25	6.31	1.81	2.49	9.66
Labor Market Index, Combining 3A/3B/3C	The index measures the general labor conditions as an equal-weighted average of its three components: labor index 3A, labor index 3B and labor index 3C. The index has a scale from 0 to 10, with a higher score indicating a lower level of labor regulation.	http://www.freetheworld.com	6.97	7.00	0.52	5.5	8.1
Homestead Exemption	The bankruptcy exemption for equity in owner-occupied principal residences. If a state had an unlimited homestead exemption, following the methodology in Berkowitz and White, it was given a value of $160,000.	Berkowitz and White (2004), Fan and White (2003)	$56,100	$20,000	$55,153	$0	$160,000
Difference Corporate – Income Taxes	The difference between corporate and income rates across states and years	http://www.taxfoundation.org	-0.029	-0.026	-0.026	-0.10	0.033
Number of Venture Capital Deals	The number of venture capital deals in a state for a given year	https://www.pwcmoneytree.com/MTPublic/ns/index.jsp	77.044	15	229.659	0	2940
Patent	Utility patents granted by the U.S. Patent and Trademark Office	http://www.uspto.gov/	1585	676	2602	33	19688
Real GDP / Population	Real GDP by State (millions of 2000 dollars) / Population by State	http://www.bea.gov	0.032	0.032	0.006	0.021	0.056

Table 2: Comparison Tests

This table provides summary statistics and comparison of means and medians tests for the indices pertaining to the size of government, transfers and taxation, and labor regulation. Cut-off values for 'high' and 'low' are taken at the median values of each index. *, **, *** Statistically significant at the 10%, 5% and 1% levels, respectively.

Panel A. U.S. Establishment Births / Population (*1000)

	U.S. Establishment Births for Firm Size 1-4						**U.S. Establishment Births for Firm Size 5-9**						**U.S. Establishment Births for Firm Size 10-19**					
	Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
No. of Obs.	259	241	262	238	249	251	259	241	262	238	249	251	259	241	262	238	249	251
Mean	1.683	1.681	1.683	1.681	1.693	1.671	0.307	0.314	0.31	0.311	0.308	0.313	0.147	0.155	0.147	0.155	0.15	0.152
Std.Dev	0.402	0.353	0.422	0.326	0.383	0.375	0.062	0.065	0.063	0.064	0.067	0.059	0.036	0.041	0.035	0.042	0.039	0.038
Median	1.58	1.605	1.569	1.641	1.622	1.591	0.294	0.3	0.296	0.297	0.291	0.303	0.137	0.145	0.137	0.144	0.139	0.144
Diff. in Means	0.07		0.66		-2.34	**	-0.12		-0.92		-3.49	***	-2.26	**	-0.78		-3.83	***
Diff in Medians	1.249		0.629		7.336	***	0.002		3.395	*	15.599	***	3.072	*	1.125		16.151	***

Panel B. U.S. Establishment Birth Rate

	U.S. Establishment Birth Rate for Firm Size 1-4						**U.S. Establishment Birth Rate for Firm Size 5-9**						**U.S. Establishment Birth Rate for Firm Size 10-19**					
	Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
No. of Obs.	262	238	249	251	244	256	262	238	249	251	244	256	262	238	249	251	244	256
Mean	0.163	0.171	0.162	0.172	0.161	0.172	0.078	0.082	0.077	0.083	0.077	0.083	0.060	0.064	0.061	0.064	0.059	0.065
Std.Dev	0.022	0.029	0.025	0.026	0.023	0.028	0.012	0.020	0.017	0.016	0.013	0.018	0.013	0.018	0.016	0.016	0.014	0.017
Median	0.161	0.166	0.158	0.168	0.159	0.167	0.078	0.077	0.074	0.081	0.076	0.081	0.058	0.060	0.057	0.059	0.056	0.062
Diff. in Means	3.330	***	4.690	***	4.860	***	2.560	**	3.750	***	4.840	***	2.680	***	2.090	**	4.120	***
Diff in Medians	4.822	**	23.583	***	17.533	***	0.396		20.426	***	20.194	***	2.447		7.124	***	15.195	***

Table 2 (Continued)

Panel C. U.S. Establishment Net Change (Births - Deaths) per Population (*1000)

	U.S. Establishment Change for Firm Size 1-4						U.S. Establishment Change for Firm Size 5-9						U.S. Establishment Change for Firm Size 10-19					
	Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
No. of Obs.	259	241	262	238	249	251	259	241	262	238	249	251	259	241	262	238	249	251
Mean	0.13	0.19	0.146	0.174	0.133	0.185	0.024	0.035	0.028	0.03	0.023	0.035	0	0.006	0.001	0.004	-0.001	0.006
Std.Dev	0.181	0.199	0.191	0.192	0.182	0.198	0.034	0.036	0.035	0.036	0.035	0.034	0.023	0.024	0.023	0.024	0.022	0.025
Median	0.127	0.158	0.127	0.14	0.129	0.151	0.021	0.032	0.026	0.026	0.019	0.034	-0.001	0.002	0.001	0	-0.003	0.003
Diff. in Means	-1.63		-3.07	***	-3.86	***	-0.86		-4.01	***	-4.23	***	-1.34		-3.38	***	-3.1	***
Diff in Medians	3.926	**	7.814	***	13.325	***	0.047		19.248	***	14.864	***	0.034		12.631	***	11.657	***

Panel D. U.S. Establishment Net Rate of Change (Births - Deaths)

	U.S. Establishment Rate of Change for Firm Size 1-4						U.S. Establishment Rate of Change for Firm Size 5-9						U.S. Establishment Rate of Change for Firm Size 10-19					
	Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
No. of Obs.	262	238	249	251	244	256	262	238	249	251	244	256	262	238	249	251	244	256
Mean	0.013	0.018	0.012	0.019	0.012	0.019	0.007	0.008	0.006	0.009	0.006	0.009	0.001	0.002	0.000	0.003	0.000	0.003
Std.Dev	0.017	0.020	0.017	0.020	0.017	0.020	0.008	0.010	0.009	0.009	0.008	0.010	0.009	0.010	0.009	0.010	0.008	0.010
Median	0.013	0.015	0.012	0.017	0.012	0.017	0.007	0.007	0.005	0.010	0.005	0.009	0.001	0.000	-0.001	0.002	-0.001	0.002
Diff. in Means	2.590	***	3.790	***	4.530	***	1.550		4.550	***	4.600	***	1.460		3.510	***	3.240	***
Diff in Medians	6.226	**	12.419	***	16.141	***	0.245		23.562	***	17.342	***	0.003		12.539	***	12.356	***

Table 2 (Continued)

Panel E. Numbers of Venture Capital Deals and Numbers of Patents

	Number of Venture Capital Deals						**Numbers of Patents**					
	Size of Gov. Index		Takings and Dis. Tax Index		Labor Index		Size of Gov. Index		Takings and Dis. Tax Index		Labor Index	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
No. of Obs.	262	238	249	251	244	256	262	238	249	251	244	256
Mean	23	134	92	60	96	57	746	2430	1607	1488	1909	1203
Std.Dev	41	320	292	141	312	100	1064	3256	2649	2383	3331	1258
Median	5	47.5	10	17	11	19	365	1542	481	783	531	696
Diff. in Means	-10.00	***	-2.42	**	-1.43		-11.71	***	-2.24	**	-0.89	
Diff in Medians	107.68	***	4.99	**	0.80		83.42	***	5.82	**	2.03	**

Table 3. Correlation Matrix

This table presents Pearson correlation coefficients across select variables, as defined in Table 1. Correlations greater in absolute value than 0.08, 0.09, and 0.12 are significant at the 1%, 5%, 10% level, respectively.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1)	US Establishment Births for Firm Size 1-4 / Population	1.00																		
(2)	US Establishment Births for Size Firm 5-9 / Population	0.78	1.00																	
(3)	US Establishment Births for Size Firm 10-19 / Population	0.51	0.75	1.00																
(4)	US Establishment Birth Rate for Firm Size 1-4	0.58	0.72	0.52	1.00															
(5)	US Establishment Birth Rate for Firm Size 5-9	0.31	0.70	0.58	0.85	1.00														
(6)	US Establishment Birth Rate for Firm Size 10-19	0.20	0.54	0.83	0.60	0.76	1.00													
(7)	US Establishment Births for Firm Size 1-4 / Population	0.30	0.15	0.06	0.43	0.29	0.19	1.00												
(8)	US Establishment Births for Size Firm 5-9 / Population	0.06	0.14	0.07	0.35	0.36	0.22	0.76	1.00											
(9)	US Establishment Births for Size Firm 10-19 / Population	0.03	0.16	0.39	0.17	0.22	0.41	0.13	0.40	1.00										
(10)	US Establishment Birth Rate for Net Change in Firm Size 1-4	0.61	0.59	0.37	0.79	0.56	0.34	0.50	0.36	0.18	1.00									
(11)	US Establishment Birth Rate for Net Change in Firm Size 5-9	0.29	0.52	0.33	0.63	0.64	0.38	0.30	0.45	0.32	0.68	1.00								
(12)	US Establishment Birth Rate for Net Change in Firm Size 10-19	0.15	0.29	0.62	0.29	0.32	0.61	0.05	0.16	0.61	0.31	0.40	1.00							
(13)	GDP / Population	0.15	-0.08	-0.10	0.10	-0.10	-0.18	0.11	0.09	0.00	0.12	0.01	-0.02	1.00						
(14)	Size of Gov. Index, Combining 1A/1B/1C	0.10	0.10	0.14	0.24	0.19	0.12	0.20	0.21	0.02	0.22	0.12	0.02	0.61	1.00					
(15)	Takings and Dis. Tax Index, Combining 2A/2B/2C/2D	-0.06	0.02	0.02	0.23	0.18	0.09	0.00	0.11	0.16	0.18	0.20	0.16	0.41	0.34	1.00				
(16)	Labor Index, Combining 3A/3B/3C	0.06	0.11	0.15	0.21	0.23	0.20	0.13	0.18	0.12	0.20	0.19	0.14	0.14	0.46	0.47	1.00			
(17)	Corporate – Income Tax	-0.05	-0.26	-0.23	-0.23	-0.33	-0.25	-0.04	-0.12	-0.08	-0.08	-0.22	-0.13	0.14	-0.16	-0.08	-0.08	1.00		
(18)	Homestead Exemption	0.11	0.13	0.12	0.06	0.13	0.11	0.13	0.09	-0.02	0.02	0.01	-0.04	-0.22	-0.10	-0.15	0.09	-0.05	1.00	
(19)	Number of Venture Capital Deals / Population	0.05	-0.05	-0.08	0.05	-0.02	-0.08	0.22	0.31	0.03	0.01	0.01	-0.06	0.36	0.34	-0.07	0.14	0.12	0.05	1.00
(20)	Patents / Population	0.22	0.05	0.01	0.09	-0.07	-0.11	0.10	0.10	0.00	0.13	-0.01	-0.01	0.37	0.40	-0.02	0.11	0.22	0.02	0.39

Table 4. Regression Analyses

This table presents OLS regressions of the determinants of births, net changes in firms, and rates of birth and net changes in each of the 50 states over the period 1995-2004. Variables are as defined in Table 1. State fixed effects are used for all Models, except Model 6 where state dummy variables are used along with the bankruptcy index which is not time variant. The dependent variables are as indicated in each Model. *, **, *** significant at the 1%, 5% and 10% level of significance, respectively.

	Model 1 US Establishment Births for Firm Size 1-4 / Population		Model 2 Rate of Change in U.S. Establishment Births for Firm Size 1-4 / Population		Model 3 US Establishment Births for Firm Size 1-4 / Population (lead 1 year)		Model 4 US Establishment Births - Deaths for Size Firm 1-4 / Population		Model 5 Rate of Change in U.S. Establishment Births - Deaths for Size Firm 1-4 / Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
GDP / Population	-2.358E-02	-8.563***			-1.624E-02	-5.013***	-3.550E-02	-8.406***		
Rate of Change in GDP / Population			7.456E-02	3.647***					1.592E-01	5.149***
Size of Gov. Index_1B: Transfers&Subsidies/GDP	5.233E-05	4.474***			2.952E-06	0.281	.2655963-04	1.602		
Rate of Change in Size of Gov. Index_1B: Transfers&Subsidies/GDP			4.134E-02	4.509***					5.325E-02	4.149***
Takings and Dis. Tax Index_2A:Tax Revenue/GDP	8.732E-05	7.483***			8.969E-05	7.039***	1.187E-04	7.288***		
Rate of Change in Takings and Dis. Tax Index_2A:Tax Revenue/GDP			9.639E-03	1.587					-9.215E-03	-0.873
Labor Freedom Index_3A: Min Wage Legislation	5.011E-05	3.446***			6.349E-05	4.091***	6.732E-05	2.933***		
Rate of Change in Labor Freedom Index_3A: Min Wage Legislation			-1.423E-03	-0.117					9.345E-03	0.480
Corporate - Income Taxes	-1.478E-03	-2.477**			-1.327E-03	-1.633	-2.274E-03	-2.636***		
Rate of Change of Corporate- Income Taxes			6.890E-05	0.550					2.081E-04	1.691*
Number of Venture Capital Deals / Population (*100)	2.045E-02	2.370**			-6.476E-04	-0.096	3.198E-02	2.522**		
Rate of Change in Number of Venture Capital Deals / Population (*100)			-6.275E-05	-0.097					-1.202E-04	-0.142
State Fixed Effects?	Yes		Yes		Yes		Yes		Yes	
Number of Observations	500		450		450		500		450	
Adjusted R^2	0.947		0.869		0.949		0.578		0.474	

Table 4. (Continued)

	Model 6		Model 7		Model 8		Model 9		Model 10	
	US Establishment Birth Rate for Firm Size 1-4		US Establishment Birth Rate for Firm Size 1-4		US Establishment Birth Rate for Firm Size 1-4		US Establishment Birth Rate for Firm Size 5-9		US Establishment Birth Rate for Firm Size 10-19	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
GDP / Population	-0.024	-8.778***	-0.025	-7.008***	-0.029	-8.612***	-0.006	-8.017***	-0.006	-4.807***
Size of Gov. Index, Combining 1A/1B/1C					3.427E-05	2.056**	1.906E-05	5.175***	7.205E-06	1.258
Size of Gov. Index_1A: Gov Consumption/GDP			1.225E-05	0.508						
Size of Gov. Index_1B: Transfers&Subsidies/GDP	5.359E-05	4.524***	3.887E-05	2.993***						
Size of Gov. Index_1C: Social Security Payments/GDP			2.188E-05	0.762						
Takings and Dis. Tax Index, Combining 2A/2B/2C					1.342E-04	7.311***	2.893E-06	0.719	3.277E-06	0.592
Takings and Dis. Tax Index_2A:Tax Revenue/GDP	8.905E-05	7.634***	9.479E-05	5.892***						
Takings and Dis. Tax Index_2B:Top Marginal Income Tax Rate			9.926E-06	0.908						
Takings and Dis. Tax Index_2C:Indirect Tax Revenue/GDP			-6.444E-06	-0.736						
Takeings_and_Discim_Tax_2D			-2.702E-05	-0.709						
Labor Freedom Index, Combining 3A/3B/3C					1.559E-04	4.746***	1.382E-05	1.774*	2.952E-05	3.343***
Labor Freedom Index_3A: Min Wage Legislation	4.882E-05	3.370***	4.755E-05	3.189***						
Labor Freedom Index_3B: Gov. Employment/Total Employment			5.847E-05	1.758*						
Labor Freedom Index_3C: Union Density			-9.073E-06	-0.620						
Corporate - Income Taxes	-1.246E-03	-2.074**	-1.443E-03	-2.340**	-1.994E-03	-3.222***	-5.477E-04	-3.161***	-2.056E-04	-0.998
Number of Venture Capital Deals / Population (*100)	2.113E-02	2.446**	1.743E-02	1.902*	9.270E-03	0.922	2.352E-03	1.314	2.033E-03	0.875
Homestead_Exemption	3.038E-09	4.913***								
Constant	6.501E-04	3.486***								
State Fixed Effects?	No		Yes		Yes		Yes		Yes	
State Dummy Variables	Yes		No		No		No		No	
Number of Observations	500		500		500		500		500	
Adjusted R^2	0.947		0.948		0.942		0.889		0.499	

Table 5. Regression Analyses for Quality of Business Creation

This table presents OLS regressions of the determinants of venture capital (number of deals and dollar value of all deals) per population and patent counts per population in each of the 50 states over the period 1996-2005. Variables are as defined in Table 1. State fixed effects are used for all Models. The independent variables are lagged by 1 year in each model, with the exception of GDP/capita which is contemporaneous with the dependent variable. The dependent variables are as indicated in each Model. *, **, *** significant at the 1%, 5% and 10% level of significance, respectively.

	Model 11		Model 12		Model 13		Model 14		Model 15	
	VC Deals Lead 1 Period / Population		VC Deals Lead 1 Period / Population		VC Dollars Lead 1 Period / Population		Patents Lead 1 Period / Population		Patents Lead 1 Period / Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
GDP / Population	0.013	3.038***	0.010	0.844	0.113	0.757	3.269	1.758*	3.462	1.943*
Size of Gov. Index_1A: Gov Consumption/GDP			0.004	3.775***	0.078	4.090***			-0.093	-2.033**
Size of Gov. Index_1B: Transfers&Subsidies/GDP	-0.001	-1.809*	-0.003	-4.131***	-0.046	-4.051***	-0.041	-1.680*	-0.041	-2.242**
Size of Gov. Index_1C: Social Security Payments/GDP			0.006	4.826***	0.077	4.031***			0.063	1.693*
Takings and Dis. Tax Index_2A:Tax Revenue/GDP			-0.001	-1.242	-0.022	-2.017**			-0.036	-2.012**
Takings and Dis. Tax Index_2B:Top Marginal Income Tax Rate			-2.673E-04	-0.564	0.001	0.168			0.006	0.817
Takings and Dis. Tax Index_2C:Indirect Tax Revenue/GDP	-0.001	-1.644	-0.001	-3.300***	-0.008	-1.156	0.010	2.093**	0.024	3.254***
Takeings_and_Discim_Tax_2D			-5.503E-04	-0.393	-0.004	-0.204			0.042	1.852*
Labor Freedom Index_3A: Min Wage Legislation			4.120E-04	0.428	0.011	0.665			-0.022	-1.437
Labor Freedom Index_3B: Gov. Employment/Total Employment	0.011	6.799***	0.004	2.642***	0.048	1.819*	0.013	0.376	3.633E-04	0.007
Labor Freedom Index_3C: Union Density			0.001	0.980	0.019	1.576			-0.022	-1.500
Corporate - Income Taxes	0.118	2.595***	0.066	1.905*	0.431	0.747	-0.156	-0.169	0.471	0.651
Births - Deaths 1-4 Employees / Population	0.002	0.790	0.005	1.573	0.092	1.642	-0.005	-0.141	0.026	0.634
Births - Deaths 5-9 Employees / Population	-0.004	-0.319	0.002	0.201	0.055	0.295	-0.243	-0.920	-0.272	-1.034
Births - Deaths 10-19 Employees / Population	-0.014	-1.766*	-0.005	-0.531	-0.191	-1.404	-0.693	-2.973***	-0.604	-2.524**
Patents / Population	0.012	3.232***	0.010	3.292***	0.172	3.058***				
Venture Capital Deals / Population							29.466	3.819***	35.918	3.955***
Venture Capital Dollars / Population							-0.091	-2.386**	-0.107	-2.607***
State Fixed Effects?	Yes		Yes		Yes		Yes		Yes	
Number of Observations	500		500		500		500		500	
Adjusted R^2	0.819		0.846		0.567		0.821		0.831	