Creating a Policy Environment for Entrepreneurs

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Entrepreneurship is often viewed as a catalyst for economic growth. Through innovation, hard work, and a willingness to accept financial risk, the entrepreneur takes advantage of previously undiscovered opportunities for arbitrage and profit (Kirzner 1997).[1] This quest for profit, and the possibility of personal and financial failure, aid in ensuring that an economy's resources are used efficiently. Successful entrepreneurs provide employment opportunities to others, generate innovation, spur economic growth, and contribute to state and local governments in the form of tax revenue (Gwartney, Holcombe, and Lawson 2004; Kreft and Sobel 2005). Because of this perception of the benefits generated by entrepreneurship, a large literature has focused on the factors that influence the decision of an individual to become an entrepreneur and the conditions under which entrepreneurship prospers.

Previous research on entrepreneurship has examined the roles of various demographic, human capital, and financial considerations in the decision to become an entrepreneur. Rees and Shah (1986), Gill (1988), and Hamilton (2000) stressed the importance of the earnings differential between entrepreneurship and paid employment. Liquidity constraints on entrepreneurship were addressed by Evans and Jovanovic (1989), Evans and Leighton (1989), and Holtz-Eakin, Joulfaian, and Rosen (1994a, 1994b). Personal and job satisfaction

Cato Journal, Vol. 26, No. 3 (Fall 2006).

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[1]Blanchflower (2004) casts doubt on this supposition, finding a negative relationship between a country's growth and its rate of self-employment.

differentials between entrepreneurship and paid employment have been addressed in Taylor (1996), Blanchflower and Oswald (1998), and Blanchflower (2000). In addition, Blanchflower, Oswald, and Stutzer (2001), Georgellis and Wall (2000a), and Beugelsdijk and Noorderhaven (2004) examined the importance of social factors, or latent entrepreneurship, in explaining differences in entrepreneurship across countries and regions, respectively.

This article examines the influence of government policy on rates of entrepreneurship across U.S. states, a topic that has been receiving increasing attention. Recent research has explored the influence of several state-level policies on entrepreneurship, such as personal income tax rates, bank deregulation, and bankruptcy laws.[2] We extend this literature by considering other policies, such as corporate income tax rates and state minimum wages. Furthermore, the flexibility of our empirical model accounts for potential nonlinearities between the policy variables and the rate of entrepreneurship in a state.

We obtain estimates of the effects of government policies on entrepreneurship by exploiting the differences in entrepreneurship and policies across the 50 U.S. states during the 1990s. Throughout, we define the rate of entrepreneurship as the share of the working age population (16–64) who are proprietors. We exclude farm proprietors, as does previous research, on the basis that the decision to become a farm proprietor depends upon different factors than the decision to become a nonfarm proprietor. As summarized by Table 1, there were substantial differences in state rates of entrepreneurship at the beginning and the end of the period. For example, in 1990 there were two states—Mississippi and South Carolina—whose rates of entrepreneurship were less than half that of Alaska, the most entrepreneurial state.[3] The decade saw significant upward movement in entrepreneurship: The average of state rates of entrepreneurship went from 13.5 percent in 1990 to 15.8 percent in 2000, and all but two states saw higher rates of entrepreneurship in 2000 than in 1990.

One of our objectives is to determine whether the geographic pattern of entrepreneurship is related to the geographic pattern of policy

[2]Kreft and Sobel (2005) looked more broadly at the effect of economic freedom, which is measured by an index constructed from a list of variables indicating the burden of government.

[3]The high rate of entrepreneurship in Alaska is due to its large number of small owner-operated businesses. In part, this reflects a tendency present in other low-density states such as Montana and Wyoming. Although our measure of entrepreneurship is not perfect, it is still the best one avaialble. In addition, because our estimation techniques include fixed effects, problems that arise when comparing entrepreneurship rates across states are controlled for.

environments. In 1990 and 2000, New England and the West were the most entrepreneurial regions, with the South and Great Lakes regions lagging. The geographic pattern of changes in entrepreneurship is less clear than the difference in the levels of entrepreneurship. Although some of the entrepreneurial states in New England and the West saw the largest increases in entrepreneurship, some of the lagging states, particularly in the South, also saw large increases.

The Empirical Model

Our empirical model extends that of Georgellis and Wall (2000a) by adding a vector of explanatory variables that controls for the policy environment:

$$(1) \quad E_{it} = \alpha_i + \tau_t + \beta' X_{it} + \theta' Z_{it} + \gamma' G_{it} + \varepsilon_{it}.$$

In equation (1), the dependent variable E_{it} is the rate of entrepreneurship in state i during year t. The parameter α_i denotes state fixed effects and τ_t denotes year effects. The vector X_{it} measures average demographic characteristics, and the vector Z_{it} measures business conditions. The policy environment is captured by the vector of policy variables, G_{it}. Finally, ε_{it} is the error term. Data sources and summary statistics for all variables used in the estimation are provided in Tables 2 and 3.

The demographic variables in X_{it} measure the age, gender, and racial compositions of state employment, categories across which rates of self-employment differ a great deal (Georgellis and Wall 2000b). For example, men are nearly twice as likely as women to be self-employed, and blacks are less than one-third as likely to be self-employed as whites or Asians. Our vector of business conditions, Z_{it}, includes the state's unemployment rate, per capita real income, industry employment shares, real proprietor's wage, per capita real wealth (as proxied by dividends, interest, and rent), and the real median house price weighted by the rate of home ownership. These last two variables control for differences in the levels of assets that the average person has to support an entrepreneurial venture.

Care needs to be taken when interpreting the estimated coefficients for the variables in X_{it} and Z_{it}. These variables might simultaneously measure differences across states in the supply of entrepreneurs and the demand for the products that are more likely to be produced by entrepreneurs. For example, more than 10 percent of self-employed women in 1997 were in the child-care business, while virtually no men were (Georgellis and Wall 2000b). On the one hand,

TABLE 1

State Rates of Entrepreneurship[a]

State	1990	2000	Change
Alabama	10.0%	12.6%	2.6
Alaska	19.4	18.8	–0.5
Arizona	13.4	17.6	4.1
Arkansas	12.1	15.1	3.0
California	14.7	17.5	2.9
Colorado	17.8	21.7	3.9
Connecticut	14.0	16.8	2.8
Delaware	11.1	13.7	2.6
Florida	12.6	15.2	2.7
Georgia	10.5	13.9	3.4
Hawaii	14.2	15.5	1.2
Idaho	17.6	19.7	2.2
Illinois	11.6	13.8	2.2
Indiana	11.3	13.1	1.8
Iowa	14.3	16.6	2.3
Kansas	15.4	16.6	1.2
Kentucky	10.5	12.4	1.9
Louisiana	10.3	12.6	2.2
Maine	16.2	20.1	3.8
Maryland	12.4	14.2	1.8
Massachusetts	12.4	16.3	3.9
Michigan	10.8	12.7	1.9
Minnesota	14.1	16.1	2.1
Mississippi	9.7	12.4	2.7
Missouri	12.9	15.3	2.4
Montana	18.3	21.4	3.2
Nebraska	15.3	17.0	1.8
Nevada	12.8	17.7	4.9
New Hampshire	15.9	18.7	2.7
New Jersey	11.8	13.0	1.2
New Mexico	13.0	15.6	2.6
New York	10.5	13.1	2.6
North Carolina	11.7	14.7	3.0
North Dakota	14.4	17.9	3.5
Ohio	10.7	13.1	2.3
Oklahoma	15.8	17.1	1.2
Oregon	15.9	17.6	1.7
Pennsylvania	12.0	13.1	1.1
Rhode Island	11.2	13.1	1.9
South Carolina	9.7	11.9	2.3
South Dakota	16.5	19.6	3.1

continued

TABLE 1 (*continued*)
State Rates of Entrepreneurship[a]

Tennessee	12.5	16.0	3.5
Texas	15.1	16.7	1.7
Utah	16.0	19.2	3.1
Vermont	18.3	21.4	3.1
Virginia	11.2	12.7	1.4
Washington	15.1	15.1	0.0
West Virginia	10.2	11.4	1.2
Wisconsin	11.6	13.2	1.6
Wyoming	18.8	19.9	1.1
Mean	13.5	15.8	2.3
St. dev.	2.7	2.8	1.0

[a] Share of the working age population (16–64) who are proprietors.

a state with a relatively high share of females might have a relatively high supply of child-care providers, and therefore have more self-employed women. On the other hand, the state also has relatively more women demanding child-care services, thereby making the state a relatively lucrative market for self-employed child-care providers. Therefore, because supply and demand cannot be separated by the variables in X_{it} and Z_{it}, we include them only as controls and do not interpret their coefficients.

An exception is the unemployment rate, which is a measure of the health of a state's economy. A low unemployment rate suggests relatively low risks and high returns for entrepreneurial ventures, thereby pulling a higher share of the population into entrepreneurship. In Parker (1996), however, a high unemployment rate indicates the number of people with limited opportunities for wage-and-salary employment who might be pushed into self-employment out of necessity. Thus, the sign of the coefficient on the unemployment rate has been interpreted as a measure of the relative strengths of the pull and push effects of the unemployment rate.

The Policy Environment

The variables of greatest interest in this article are the four measures of state policy in the vector of policy variables, G_{it}. This vector includes measures of bankruptcy laws, personal income taxes, corporate income taxes, and the minimum wage.

TABLE 2
DATA SOURCES

Data Series	Source
Nonfarm proprietors' employment; total nonfarm employment	Regional Economic Information System, Bureau of Economic Analysis, Table CA25
Unemployment rate	Household Survey, Bureau of Labor Statistics
Dividends, interest, and rent	Regional Economic Information System, Bureau of Economic Analysis, Table CA05
Per capita gross state product	Bureau of Economic Analysis
Average nonfarm proprietors' income; average wage and salary disbursements	Regional Economic Information System, Bureau of Economic Analysis, Table CA30
Industry employment shares; age, race, and sex employment shares	Establishment Survey, Bureau of Labor Statistics
Maximum marginal tax rates	TAXSIM, National Bureau of Economic Research
Maximum corporate tax rate	Council of State Governments, *The Book of the States,* various editions
Minimum wage	"State Labor Legislation Enacted in 199X," *Monthly Labor Review,* various issues, 1990–98
Homestead bankruptcy exemptions	Elias, Renauer, and Leonard, *How to File for Chapter 7 Bankruptcy,* various editions
Median house price	Derived using median house price from 1990 Census and the Home Price Index from the Office of Federal Housing Enterprise Oversight
Home ownership rate, median house price, metro population, and total population	Census Bureau

continued

TABLE 2 (*continued*)
Data Sources

Data Series	Source
Share of households with householder and spouse	Census Bureau, derived from 1990 and 2000 Census assuming constant state-level rates of change

Homestead Exemption

State bankruptcy laws allow those filing for personal bankruptcy to exempt some of their assets and income from creditors. The exemptions can include some or all of the value of the person's home, pension, and a host of other assets. Because an entrepreneur's home is likely to be his or her most valuable asset, recent studies have focused on the possibility of a link between the homestead exemption and levels of entrepreneurship (Berkowitz and White 2004; Fan and White 2003; Georgellis and Wall 2006). These studies have posited two opposing effects. The first effect arises because a potential entrepreneur views the level of the homestead exemption as insurance against the failure of an entrepreneurial venture. If one's home is not subject to distribution to creditors, a potential entrepreneur is more likely to take on the increased risk of being an entrepreneur instead of being a wage-and-salary employee. In addition to this *wealth-insurance effect*, however, the homestead exemption creates a *credit-access effect*. Banks and other creditors are aware of bankruptcy exemptions and adjust the availability of credit accordingly. Thus, by making credit more difficult to come by, the homestead exemption might reduce the number of entrepreneurs.

Our homestead exemption rate is a measure of the percentage of the average person's homestead that would be protected from creditors in the event of personal bankruptcy. In creating the variable, we need to account for several state-level differences in the treatment of homesteads during bankruptcy proceedings. The primary source of these differences is the homestead exemption—the amount of a home's value that is exempt from bankruptcy proceedings. Cross-state differences in the homestead exemption are summarized in the first data column of Table 4. These differences are significant: In 1997, six states did not allow for any amount of the value of a person's home to be exempt from distribution to creditors, but eight other states placed no limit on the amount that could be exempted.

TABLE 3
SUMMARY STATISTICS

	Mean	Standard Deviation	Maximum	Minimum
Rate of entrepreneurship	14.61	2.91	21.56	9.66
Homestead exemption rate	28.67	24.72	75.40	0.00
Max. personal income tax rate	38.37	4.07	44.87	28.00
Max. corporate income tax rate	6.09	2.85	12.25	0.00
Minimum wage relative to productivity	0.20	0.03	0.29	0.14
Unemployment rate	5.76	1.54	11.40	2.50
Real income per capita ($thous.)	21.25	3.68	35.95	13.38
Relative proprietor's wage	0.74	0.11	1.05	0.51
Real wealth per capita ($thous.)	4.13	0.84	6.99	2.30
Real median house price ($thous.)	59.93	21.40	147.59	31.37
Ag. services, forestry, fishing share	1.50	0.73	5.74	0.70
Mining share	6.58	1.06	10.04	4.49
Construction share	8.39	1.70	14.94	5.54
Manufacturing share	15.21	5.56	27.43	3.51
Transportation and public utilities share	1.12	1.70	10.10	0.03
Wholesale trade share	20.98	1.72	24.98	16.61
Retail trade share	35.00	3.94	50.52	26.84
Finance, insurance, and real estate share	5.87	1.13	10.49	3.56
Services share	5.34	0.89	7.75	3.44

continued

TABLE 3 (*continued*)
Summary Statistics

	Mean	Standard Deviation	Maximum	Minimum
Share of population in metro areas	67.63	20.35	100.00	29.62
Adult share aged 45–65	26.73	1.51	31.49	22.36
Adult share aged 65+	17.16	2.55	24.31	6.23
Female share of employment	46.16	1.31	49.25	41.63
Black share of employment	9.93	9.36	36.37	0.31
Native American share of employment	1.66	2.94	16.05	0.13
Asian share of employment	3.15	8.73	63.30	0.44
Hispanic share of employment	5.98	7.92	39.95	0.47

The homestead exemption rate is constructed to allow also for the fact that some states permit filers to use the federal exemption level and that some states allow married filers to double the exemption level.[4] In addition, because our variable is meant to capture the exemption that the average person in a state might face, we control for differences in the average house price and in home ownership rates.[5] As in Georgellis and Wall (2006), we also consider the square and cube of the homestead exemption rate to control for the potential nonlinearities resulting from the opposing wealth-insurance and credit-access effects.

[4]The federal homestead exemption was $15,000 in 1997.

[5]To construct the homestead exemption rate, we took the state exemption level or, if the state allows the federal option, the maximum of the state and federal exemption levels. If this exemption level was greater than the average house price in the state, we used the average house price instead. We then multiplied this by the state's homeownership rate and, if the state allows married householders to double the exemption, we multiplied this by 1 plus the state's share of households in which both spouses reside together. The homestead exemption rate is this result divided by the average house price.

TABLE 4

STATE POLICY ENVIRONMENTS, 1997

State	Homestead Exemption	Max. Marginal Personal Income Tax Rate (%)	Maximum Corporate Income Tax Rate (%)	Minimum Wage Relative to Productivity
Alabama	$5,000	3.12	5.0	0.23
Alaska	54,000	0	5.2	0.16
Arizona	100,000	4.8	9.0	0.21
Arkansas	no limit	7.0	3.75	0.25
California	7,500	9.78	9.3	0.18
Colorado	20,000	5.36	5.0	0.21
Connecticut	0	4.5	11.25	0.16
Delaware	0	6.9	8.7	0.15
Florida	no limit	0	5.5	0.21
Georgia	5,000	5.83	6.0	0.20
Hawaii	30,000	9.0	5.4	0.20
Idaho	30,000	8.2	8.0	0.25
Illinois	7,500	3.0	4.8	0.18
Indiana	7,500	3.4	3.4	0.22
Iowa	no limit	6.36	9.0	0.23
Kansas	no limit	6.45	4.0	0.24
Kentucky	5,000	6.0	6.13	0.22
Louisiana	15,000	3.75	6.0	0.19
Maine	7,500	8.5	6.22	0.25
Maryland	0	6.0	7.0	0.19
Massachusetts	100,000	5.95	9.5	0.18
Michigan	3,500	4.4	1.15	0.20

Minnesota	no limit	8.86	9.8	0.21
Mississippi	30,000	4.85	4.0	0.25
Missouri	8,000	6.0	6.25	0.22
Montana	40,000	6.83	6.75	0.29
Nebraska	10,000	7.0	6.7	0.24
Nevada	90,000	0	0	0.19
New Hampshire	5,000	0	7.0	0.20
New Jersey	0	6.37	9.0	0.15
New Mexico	20,000	8.4	6.2	0.20
New York	10,000	6.85	9.0	0.15
North Carolina	7,500	8.08	7.75	0.22
North Dakota	80,000	5.25	6.75	0.28
Ohio	5,000	7.2	7.0	0.21
Oklahoma	no limit	6.05	6.0	0.25
Oregon	15,000	9.0	6.6	0.21
Pennsylvania	0	2.8	10.0	0.20
Rhode Island	0	9.66	9.0	0.20
South Carolina	5,000	7.3	5.0	0.23
South Dakota	no limit	0	0	0.26
Tennessee	5,000	0	6.0	0.22
Texas	no limit	0	0	0.19
Utah	8,000	5.72	5.0	0.24
Vermont	30,000	8.85	6.88	0.25
Virginia	5,000	5.75	6.0	0.20
Washington	30,000	0	0	0.20
West Virginia	7,500	6.5	9.0	0.23
Wisconsin	40,000	6.93	7.9	0.23
Wyoming	10,000	0	0	0.18

Personal Income Tax

Of the policy variables that we consider, the personal income tax is the one that has received the most attention in the literature. For the most part, the effect of personal income tax rates on entrepreneurship has been expected to be negative—a *labor-supply effect*—although most studies have found a positive relationship.[6] The usual explanation for this unexpected result is a *tax-avoidance effect* arising from the observation that being an entrepreneur affords greater opportunity for tax avoidance than does wage-and-salary employment. Georgellis and Wall (2006) allow for a nonlinear relationship between personal income tax rates and entrepreneurship and find that the labor-supply effect dominates at low tax rates while the tax-avoidance effect dominates at higher tax rates.[7]

While most studies have focused on the level of personal income taxes, other studies have found that the structure of personal income tax systems can affect levels of entrepreneurship. Bruce (2000), for example, notes that the tax system treats self-employment and wage-and-salary earnings differently. Also, Bruce, Deskins, and Mohsin (2004) and Gentry and Hubbard (2000) find that the progressivity of personal income taxes can be important.

As the second data column of Table 4 illustrates, states differ a great deal in their tendency to use income taxes to generate revenue. Nine states had no income tax in 1997, while 10 states had their highest statutory marginal tax rate set at 8 percent or higher.

Our personal income tax variable is the maximum marginal tax rate (state plus federal) as generated by the NBER's TAXSIM model. Although few people actually face the maximum marginal tax rate, it should be strongly correlated with the marginal tax rate that the average person faces. As in Georgellis and Wall (2006), we include both the level and the square of the maximum marginal personal income tax rate to capture the competing effects of the tax rate on labor effort and tax avoidance.

[6]See Long (1982a, 1982b), Evans and Leighton (1989), Blau (1987), Parker (1996), Schuetze (2000), Gentry and Hubbard (2000), Bruce and Mohsin (2003), and Fan and White (2003). See Schuetze and Bruce (2004) for a survey.

[7]Cullen and Gordon (2002) offer a different explanation for the positive relationship. They argue that the tax system provides a net subsidy to risk-taking because entrepreneurs have the option of whether or not to incorporate their businesses. Because personal income tax rates are higher than corporate rates, an entrepreneur facing losses would prefer to face personal income tax rates so that the deduction of the losses against other income would have greater value. An increase in personal income tax rates makes this option more valuable and makes it more likely that someone would choose to become an entrepreneur.

Corporate Income Tax

A corporation is a separate legal entity that is distinct from the entrepreneur. Unlike an unincorporated entrepreneur, who is personally liable for the assets and liabilities of running a business, an incorporated entrepreneur's liability is limited to the assets of the corporation. In addition, because potential buyers will also have limited liability for the actions of the seller, incorporation might increase the market value of a business. Incorporation might make it easier for an entrepreneur to raise investment capital, primarily because it allows an entrepreneur to issue shares of stock.

Higher rates of corporate income tax mean that some entrepreneurs will choose to not incorporate, although they might still be unincorporated entrepreneurs. For some entrepreneurial ventures, however, incorporation might be the only viable choice, perhaps because they require relatively large amounts of capital or because the ventures are relatively risky. These ventures might not be started if corporate income tax rates are too high. Even the number of unincorporated entrepreneurs can be affected by the rate of corporate income tax because future incorporation might be in the plans when an entrepreneurial venture grows. High corporate income tax rates reduce future profitability and might dissuade some potential entrepreneurs from becoming unincorporated entrepreneurs.

In addition to the negative effects outlined previously, higher corporate income tax rates might have a positive effect on the number of entrepreneurs. Because the corporate income tax is levied on all corporations, whether they are run by entrepreneurs or not, the suppressing effect of corporate taxes might reduce the number of wage-and-salary employment opportunities at corporations. In this way, high corporate income tax rates might have the effect of pushing people out of their jobs as wage-and-salary employees and into entrepreneurship. When interpreting our estimates, we should keep in mind that this effect, while increasing the number of entrepreneurs, reflects the overall deleterious effects of overly high tax rates.

The rates at which states tax the income of corporations (see Table 4) are very different. On the one hand, five states, none of which taxed personal income in 1997, also had no tax on corporate income. On the the other hand, for 11 states, the top tax rate was 9 percent or higher. Our corporate income tax variable is the maximum statutory state corporate income tax rate. We use a quadratic specification to capture the possibility of the two opposing effects of corporate income tax rates.

Minimum Wage

On average, businesses run by entrepreneurs are more likely than other businesses to see their hiring decisions affected by the minimum wage. Large shares of entrepreneurs are in industries that rely on low-wage workers: Four of the top five industry categories in terms of the percentages of workers earning the minimum wage or below account for about one-third of self-employed men and about one-half of self-employed women.[8] For such businesses, an increase in the minimum wage would make it more difficult for some portion of them to remain profitable. The fact that the federal minimum wage is set at the same level for all states makes it more problematic for entrepreneurs in low-productivity states. Although the minimum wage is largely uniform across the country, employers in low-productivity states have a more difficult time finding workers whose productivity justifies being paid the minimum wage. Because of this, our minimum wage variable is the statutory minimum wage relative to the average productivity of labor in the state, as measured by per employee gross state product (GSP) per hour.[9]

It is worth noting that there are substantial variations in both the numerator and the denominator of our relative minimum wage variable. Clearly, because employment and GSP differ greatly across states and change frequently over time, movements in the denominator will be responsible for much of the variation in the variable. But the numerator also exhibits substantial variation: Eight states had statutory minimum wages that were higher than the federal level at some time during the sample, and the federal minimum wage was increased in two stages at the end of the sample period—from $4.25 to $4.75 in 1996, and to $5.15 in 1997. In addition, some states with minimum wages that were already higher than the federal level raised their minimum wages in stages that were not in synch with the federal stages. In all, out of 700 observations, our sample has 100 instances of increases in the statutory minimum wage.

Other Policy Variables Not Considered

There are policy variables that have appeared in the literature that we do not consider here. For example, Bruce, Deskins, and Mohsin

[8]The four categories are (1) retail, (2) business, auto, and repair services, (3) personal services, and (4) entertainment and recreation (Bureau of Labor Statistics, *Characteristics of Minimum Wage Workers*; Georgellis and Wall 2000b).

[9]Although some states do not have a minimum wage, the federal minimum wage law supersedes state laws. Several states impose a minimum wage that is higher than the federal level.

(2004) include the state sales tax rate, which we have decided to exclude. First, because of the large variation of total sales tax rates within states (due to county and city sales taxes on top of state sales taxes), it is it difficult to arrive at a single sales tax rate variable. Second, although the state sales tax rate might serve as a proxy, it varies too little over our sample period to be useful.

Black and Strahan (2002) estimated the effect of state bank deregulation on entrepreneurship over the period 1976–94, finding statistically significant and large effects for the deregulation of branches and of interstate banking.[10] We have not considered bank deregulation in this study because most of the deregulation occurred before the start of our sample. Further, as suggested by Wall (2004), Black and Strahan's results are likely driven by the endogeneity of the deregulation process.

Estimation and Results

Using data on entrepreneurship for 1992–98, we estimate our model with feasible generalized least squares (FGLS) and control for state-specific autocorrelation and heteroskedasticity. Although the magnitudes of the estimated coefficients using FGLS do not differ substantially from estimates that OLS would provide, the richer error structure allowed for by FGLS makes it superior for estimating state panels of entrepreneurship (Georgellis and Wall 2006; Wall 2004). To avoid issues of simultaneity and to capture the lag between the decision to become an entrepreneur and its realization, we use lagged values of all of our independent variables. The reference variables are the adult share of the population aged 18–24, the white share of the population, government share of employment, and the year 1992.

Our estimation results, summarized in Table 5, indicate that both sets of control variables are important for our estimation. The coefficients on the business environment variables tend to be statistically significant, as are many of our demographic variables. However, only the coefficient on the unemployment rate is easily interpreted. The positive and statistically significant coefficient suggests that the push effects of the unemployment rate dominate the pull effects. Specifically, a one-percentage-point increase in the unemployment rate increases the rate of entrepreneurship by about one-eighth of a percentage point, since many individuals who are unable to find wage-and-salary employment instead become self-employed.

[10]The Black and Strahan (2002) study differed from most of the literature in defining entrepreneurship as new incorporations.

TABLE 5

Regression Results

	Coefficient	Std. Error	t-statistic
Policy Environment			
Homestead exemption rate	–0.096*	0.022	–4.33
Homestead exemption rate squared	0.003*	0.001	3.81
Homestead exemption rate cubed	–0.00002*	0.00001	–3.65
Max. personal income tax rate	–0.037	0.054	–0.70
Max. personal income tax rate squared	0.001	0.001	0.79
Max. corporate income tax rate	–0.138*	0.082	–1.68
Max. corporate income tax rate squared	0.005	0.006	0.90
Min. wage relative to productivity	–5.661*	2.091	–2.71
Business Environment			
Unemployment rate	0.120*	0.022	5.53
Real income per capita	–0.162*	0.091	–1.77
Relative proprietor's wage	0.163	0.380	0.43
Real wealth per capita	0.150	0.243	0.62
Real median house price	0.027*	0.008	3.44
Industry shares	yes		
Demographics			
Share of population in metro areas	–0.174*	0.063	–2.77
Adult share aged 45–65	0.102*	0.049	2.06
Adult share aged 65+	0.318*	0.097	3.26
Female share of employment	0.052*	0.019	2.72

Black share of employment	0.063	0.098	0.64
Native American share of employment	−0.142*	0.309	−0.46
Asian share of employment	−0.104	0.193	−0.54
Hispanic share of employment	0.040	0.067	0.60
Year Effects			
1993	0.088	0.073	1.21
1994	0.352*	0.103	3.41
1995	0.701*	0.134	5.24
1996	1.139*	0.162	7.03
1997	1.374*	0.191	7.19
1998	1.631*	0.224	7.29
State Fixed Effects	yes		

Notes: The feasible FGLS estimation corrects for state-specific heteroskedasticity and autocorrelation; the single asterisk indicates significance at the 10 percent level or higher; number of observations = 350; the dependent variable is the rate of entrepreneurship.

Our estimated year effects suggest that there was a temporal pattern to entrepreneurship that was not captured by our other right-hand-side variables. Even if all variables remained at their initial levels, entrepreneurship would have risen every year of our sample and would have been 1.6 percentage points higher in 1998 than in 1992. Put another way, 70 percent of the 2.3 percentage point rise in the average rate of entrepreneurship can be attributed to a common trend.

The variables of most interest are the policy variables, and our results suggest that most of them are important in determining the level of entrepreneurship. As reported in Table 5, the coefficients on the homestead exemption rate, corporate income tax rate, and the relative minimum wage are all statistically different from zero. Further, as reported in Table 6, Wald tests of the joint significance of these variables indicate that only the personal income tax rate does not have statistically significant effects on the estimation. The estimated effects of the four policy variables on rates of entrepreneurship are illustrated by Figures 1–4. As these figures show, in addition to being statistically significant, these policies also tend to be economically significant.

TABLE 6

WALD TESTS OF THE JOINT SIGNIFICANCE OF POLICY VARIABLES

Policy Variable (n)	χ^2 (n)	Prob > χ^2 (n)
Homestead exemption (3)	21.97	0.0001
Personal income tax rate (2)	1.84	0.3981
Corporate income tax rate (2)	5.61	0.0606

Homestead Exemption Rate

As in Fan and White (2003), Berkowitz and White (2004), and Georgellis and Wall (2006), we find that the decision to become an entrepreneur is related to the homestead exemption. As Figure 1 illustrates, the relationship between the homestead exemption rate and the entrepreneurship rate has the same S-shape found by Georgellis and Wall (2006). For homestead exemption rates between 0 and 22, the credit-access effect dominates the wealth-insurance effect, meaning that an increase in the homestead exemption should lead to a decrease in entrepreneurship. An increase in the homestead exemption rate from 0 to 22 will lead to a decrease in the rate of

FIGURE 1
Homestead Exemptions

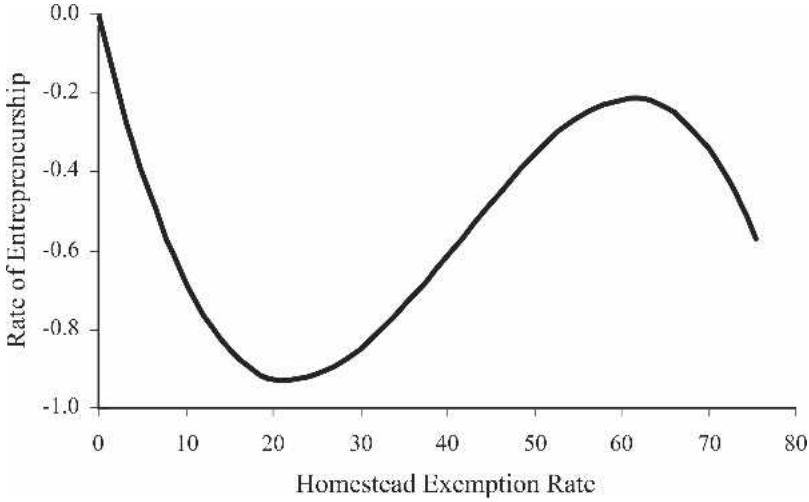


FIGURE 2
Personal Income Taxes

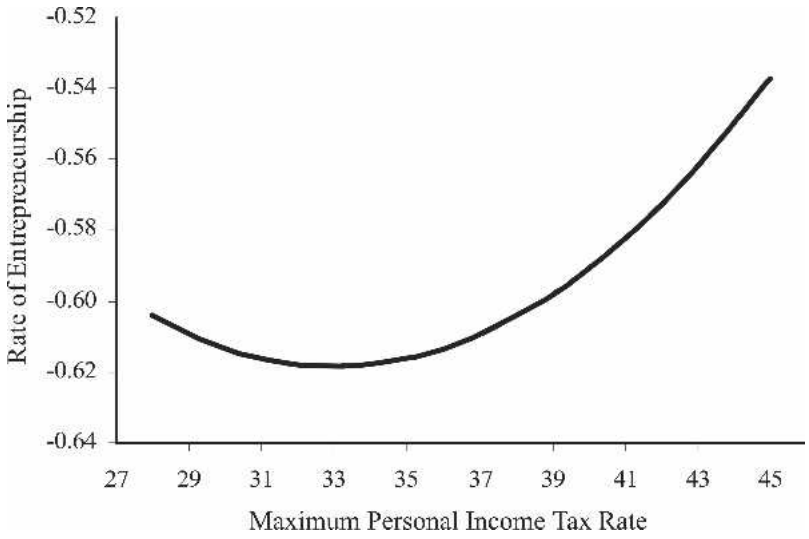


FIGURE 3
Corporate Income Taxes

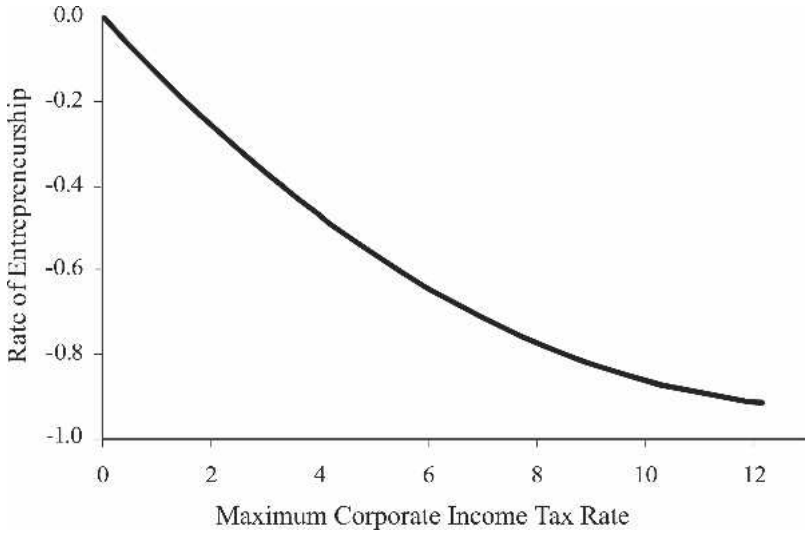
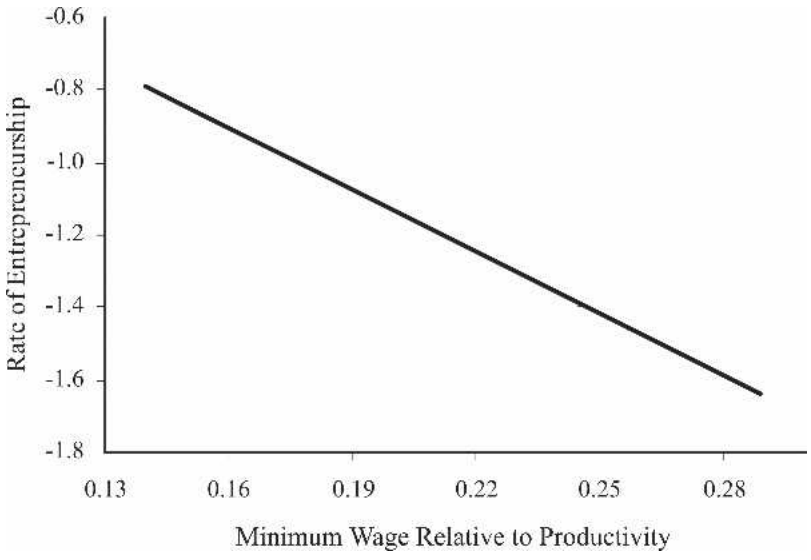


FIGURE 4
Minimum Wage



entrepreneurship of just over nine-tenths of a percentage point. This is quite a large effect given that the mean entrepreneurship rate in the sample is 14.6 percent.

Beyond a homestead exemption rate of 22 until about 62, the wealth-insurance effect dominates the credit-access effect and an increase in the homestead exemption should lead to an increase in entrepreneurship. An increase from 22 to 62 should lead to an increase of about seven-tenths of a percentage point in the rate of entrepreneurship. Beyond a homestead exemption rate of 62, further increases in the homestead exemption would tend to reduce the number of entrepreneurs.

The highest rates of entrepreneurship are attained when the homestead exemption is zero. This is in contrast to previous research, which found that an increase in the homestead exemption would lead to an increase in entrepreneurship for all starting levels. We find that this is true only within some ranges of the homestead exemption.

Personal Income Tax

Although the maximum personal income tax variable is not statistically significant, our point estimates do suggest the same U-shaped relationship between it and the rate of entrepreneurship found by Georgellis and Wall (2006). As seen in Figure 2, at lower tax rates the labor-supply effect dominates, but at higher tax rates the tax-avoidance effect dominates. It is clear from the vertical scale of the figure, however, that even if these effects were statistically significant, they would have very little economic significance. The highest and lowest rates of entrepreneurship along the curve differ by only about 0.08 percentage points. This failure to find a relationship between the rate of personal income tax and state-level entrepreneurship is consistent with Bruce, Deskins, and Mohsin (2004). Left unanswered by our results, however, is whether there is a negative relationship between entrepreneurship and the progressivity of the personal income tax system as suggested by Bruce, Deskins, and Mohsin (2004) and Gentry and Hubbard (2000).

Corporate Income Tax

Unlike the personal income tax rate, the corporate income tax rate appears to have very large effects on entrepreneurship, as seen in Figure 3. Up to the highest rate in our sample, an increase in the maximum corporate income tax rate will push more people out of entrepreneurship than it will push into it by reducing opportunities for wage-and-salary employment at corporations. The effect of the corporate income tax rate can be substantial. All else equal, a state

that does not levy a tax on corporate income will tend to have a rate of entrepreneurship that is about 0.9 percentage points higher than a state that levies a maximum corporate income tax rate of 12 percent.[11] Note that, because our measure of entrepreneurship excludes incorporated entrepreneurs, we are probably understating the effects of the corportate income tax rate. The effect that we find is on the number of potential unincorporated entrepreneurs who have been dissuaded from becoming entrpreneurs because of the effect of corporate taxes on future profitability. Presumably, the direct effect of the corporate income tax will be even higher on those who are incorporated and are paying the tax currently.

Minimum Wage

Our fourth policy variable, the minimum wage relative to productivity, is negatively related to the rate of entrepreneurship.[12] This relationship is illustrated by Figure 4. Consider the case of Montana, which in 1997 had the highest relative minimum wage in our sample, 0.29. If Montana's relative minimum wage was instead 0.14, the minimum in our sample, its rate of entrepreneurship would have been eight-tenths of a percentage point higher. These results suggest that a reduction in the federal minimum wage would increase entrepreneurship across states, and that the federal minimum wage hits poorer states especially hard. Entrepreneurs in these states, where productivity is lowest, are required to pay the same level of minimum wage as in the richest states, even though workers with the corresponding level of productivity to warrant being paid the minimum wage are more difficult to find. Consequently, all else equal, in the relatively poor states the federal minimum wage results in fewer entrepreneurs and fewer of the benefits that entrepreneurship can bring. Of course, an increase in the productivity of the workforce, perhaps through improved education, would also lower a state's relative minimum wage and bring about a higher rate of entrepreneurship.

Geographic Variation in the Effects of the Policy Environment

The significant cross-state variation in policies summarized by Table 4 means that there were significant cross-state differences in

[11]In contrast, in their time-series study of aggregate rates of entrepreneurship, Bruce and Mohsin (2003) find that the effect of the maximum federal corporate income tax rate is statistically significant but small.

[12]Bruce and Mohsin (2003) find that changes in the real federal minimum wage have been related to changes in the aggregate rate of entrepreneurship over time. Their minimum wage variable differs from ours in that it does not account for changes in productivity.

the effects of government policies on levels of entrepreneurship. Our estimates of the percentage effects of the policies for each state are in Table 7: The first column is the percentage difference in the number of entrepreneurs because the homestead exemption is not zero, the second column is the percentage difference because the corporate income tax is not zero, and the third column is the percentage difference because the state's relative minimum wage differs from the lowest among the states. The final column is the total effect of the three policies on the number of entrepreneurs. The total effects of the policy environment range from the 2.7, 2.8, and 4.2 percent decreases for Texas, Nevada, and Wyoming to the 15.3, 15.4, and 19.4 percent decreases for Wisconsin, Pennsylvania, and West Virginia. The average across all states was a 10.2 percent decrease.

There is a geographic pattern to the effects of the policy environment on the number of entrepreneurs: The states with the least-friendly policies for entrepreneurs are located almost exclusively in the Eastern half of the country, with Southern and Great Lakes states prominent. The least entrepreneurial states tend to also be the states with the worst policy environments for entrepreneurs. More specifically, the Spearman rank correlation between the levels of entrepreneurship and the effect of the policy environment is –0.578, which is statistically significant at the 1 percent level.

Although there is a strong correlation between the levels of entrepreneurship and the policy environment, this explains only part of the regional pattern (see Table 8). On the one hand, for the 15 least entrepreneurial states, the seven located in the South had average policy effects of –13.9 percent, which is somewhat higher than the average policy effect of –12.6 percent for the Northern subset of these states. Among the less entrepreneurial states, therefore, policy contributions to the rates of entrepreneurship were not terribly important in explaining regional variations.

On the other hand, for the 11 most entrepreneurial states, the regional differences in policy are more pointed: The three New England states had policy environments that were substantially less friendly to entrepreneurs than were those of the entrepreneurial states of the West. The average effect of the policy environment in the New England states was –10.7 percent, which is actually larger in absolute terms than the cross-state average. The Western states, however, were much friendlier to entrepreneurs, having an average policy effect of –7.4. Thus, while a good portion of the Western states' primacy in entrepreneurship was due to their policy environment, the

TABLE 7

Effects of Policy Environment on Entrepreneurship (Percentage Difference in the Number of Entrepreneurs, 1998)

State	Homestead Exemption	Corporate Income Tax	Productivity Bias of the Min. Wage	Total
Alabama	–5.0	–4.8	–3.7	–13.4
Alaska	–4.2	–2.7	–0.2	–7.0
Arizona	–1.4	–5.5	–2.1	–9.1
Arkansas	–1.8	–3.1	–3.8	–8.6
California	–4.1	–4.9	–0.8	–9.7
Colorado	–4.5	–2.7	–1.6	–8.8
Connecticut	–5.0	–5.5	–0.1	–10.6
Delaware	0.0	–6.6	0.0	–6.6
Florida	–1.9	–4.2	–2.3	–8.4
Georgia	–3.9	–5.1	–2.0	–11.0
Hawaii	–3.9	–3.5	–1.6	–9.1
Idaho	–1.4	–4.0	–3.0	–8.4
Illinois	–4.3	–4.1	–1.3	–9.7
Indiana	–5.9	–3.2	–3.0	–12.1
Iowa	–2.6	–5.0	–2.8	–10.4
Kansas	–1.5	–2.8	–2.9	–7.2
Kentucky	–5.2	–5.4	–3.3	–13.9
Louisiana	–6.4	–5.3	–1.6	–13.3
Maine	–4.7	–3.5	–3.0	–11.2
Maryland	0.0	–5.0	–1.6	–6.7
Massachusetts	–4.5	–5.5	–1.2	–11.2
Michigan	–7.5	–1.2	–2.1	–10.8
Minnesota	–3.5	–5.3	–2.2	–10.9
Mississippi	–4.2	–4.1	–4.7	–13.1
Missouri	–3.8	–4.5	–2.7	–11.0
Montana	–2.1	–3.2	–3.6	–8.9
Nebraska	–5.1	–4.2	–2.9	–12.2
Nevada	–1.4	0.0	–1.4	–2.8
New Hampshire	–5.1	–4.0	–1.5	–10.6
New Jersey	–5.0	–6.5	0.0	–11.5
New Mexico	–5.1	–4.2	–1.9	–11.1
New York	–3.6	–6.4	0.0	–10.0
North Carolina	–5.7	–5.5	–2.5	–13.7
North Dakota	–1.7	–4.1	–4.2	–10.0
Ohio	–3.8	–5.5	–2.5	–11.8
Oklahoma	–1.7	–3.7	–3.1	–8.6
Oregon	–4.4	–3.8	–1.8	–10.0

continued

TABLE 7 (*continued*)

Effects of Policy Environment on Entrepreneurship (Percentage Difference in the Number of Entrepreneurs, 1998)

State	Homestead Exemption	Corporate Income Tax	Productivity Bias of the Min. Wage	Total
Pennsylvania	–6.9	–6.5	–2.0	–15.4
Rhode Island	–5.7	–6.5	–2.0	–14.2
South Carolina	–4.7	–4.8	–3.9	–13.4
South Dakota	–1.5	0.0	–3.1	–4.6
Tennessee	–2.5	–4.2	–2.7	–9.4
Texas	–1.3	0.0	–1.3	–2.7
Utah	–2.0	–3.1	–2.6	–7.7
Vermont	–4.0	–3.5	–2.9	–10.5
Virginia	–3.4	–5.0	–2.1	–10.5
Washington	–5.8	0.0	–1.6	–7.4
West Virginia	–8.0	–7.4	–4.0	–19.4
Wisconsin	–6.4	–5.8	–3.1	–15.3
Wyoming	–3.4	0.0	–0.8	–4.2

high rates of entrepreneurship in New England states was achieved despite their relatively unfriendly policy environments. New England's advantages might lie in factors not included explicitly in our model, such as latent entrepreneurial spirit and the presence of universities willing and able to generate entrepreneurial spillovers.

TABLE 8

Policy Environments of the Least and Most Entrepreneurial States and Regions

State and Region	Average Effect of Policy Environment
Bottom 15 states	–13.2
South (7)	–13.9
North (8)	–12.6
Top 11 states	–8.3
New England (3)	–10.7
West (8)	–7.4

Table 9 provides further evidence of the potential importance of a state's policy environment in determining its rate of entrepreneurship. The first column shows for the 15 least entrepreneurial states the percentage-point gap between the state's rate of entrepreneurship and the average rate of entrepreneurship. The second column indicates the relative importance of the policy environment in determining the state's entrepreneurship gap—that is, the ratio of the state's entrepreneurship gap to the percentage-point effect of the state's policy environment on its rate of entrepreneurship. The policy environments account for between 37 and 95 percent of the entrepreneurship gaps for these states.

TABLE 9

THE POLICY ENVIRONMENT FOR THE BOTTOM 15 STATES

State	Entrepreneurship Gap[a]	Relative Importance of Policy Environment[b]
West Virginia	4.3	50.5
Mississippi	4.1	36.7
South Carolina	3.7	43.1
Alabama	3.6	43.2
Kentucky	3.4	48.9
Louisiana	3.3	48.3
Michigan	3.1	42.4
Rhode Island	2.7	67.3
Virginia	2.7	50.2
New Jersey	2.6	55.2
New York	2.5	51.6
Ohio	2.5	61.6
Indiana	2.5	63.6
Wisconsin	2.1	94.5

[a]The difference between the mean rate of entrepreneurship and the state's actual rate of entrepreneurship for 1998.

[b]The ratio of the gap and the percentage-point effect of the policy environment on the rate of entrepreneurship.

Conclusion

We find that corporate income tax rates, bankruptcy law, and minimum wage legislation all have statistically and economically significant effects on rates of entrepreneurship across U.S. states. These results highlight that in terms of government policy, the greatest gains

in entrepreneurship can be had by reducing government-imposed burdens on entrepreneurs and other businesses. These gains in entrepreneurship likely dwarf those that can be attained by direct intervention (i.e., subsidies or tax breaks) aimed at individual entrepreneurs or businesses.

We find that the geographic pattern of entrepreneurship is similar to the geographic pattern of policy environments: The low entrepreneurship states of the Great Lakes and the South tend to have relatively unfriendly policy environments, while the high entrepreneurship states of the West tend to have relatively friendly policies. However, New England states tend to have relatively unfriendly policy environments and high rates of entrepreneurship.

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