Public Policy, Entrepreneurship, And Economic Freedom

Steven F. Kreft and Russell S. Sobel

The "entrepreneurial spirit" is something that has long been associated with the driving force behind economic progress and growth. Joseph Schumpeter (1942) stated that the key to the success of markets lies in the spirits of entrepreneurs who persist in developing new products and technologies, through a process he termed as "creative destruction." Kaiser (1990) modeled the entrepreneur on the basis of many historical characterizations, including the Schumpeterian innovator, and concluded that the major characteristics of the entrepreneur—innovator, risk taker, and resource allocator—are complementary and inseparable facets of entrepreneurship. Kirzner (1997) argues that the entrepreneurial discovery process is vital to the effectiveness of markets, where discovery entails entrepreneurs discovering profit opportunities by trial and error. In this same respect, Jenner (1998) models the Schumpeterian entrepreneurial process as a dynamic process in which entrepreneurs search for new combinations of products and production techniques that will lead to increased productivity and economic growth. Knight (1921) views the entrepreneur as the bearer of the uninsurable uncertainty present in the marketplace, with the profit earned being the compensation for bearing this uncertainty.

Recently, the conceptual link between entrepreneurship and economic growth has received renewed interest by economists. As argued by Minniti (1999), entrepreneurs are the catalysts for economic growth because they create a networking externality that promotes the creation of new ideas and new market formations. The finding

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that increased entrepreneurial activity leads to greater economic growth has been well-established at both the national and local levels. For example, Reynolds, Hay, and Camp (1999) show that one-third of the differences in national economic growth rates can be attributed to the level of entrepreneurship in each country. Supporting these findings, Zacharakis, Bygrave, and Sheperd (2000) study 16 developed economies and find that entrepreneurial activity explains approximately one-half of the differences in GDP growth between countries. More recently, Henderson (2002) shows that entrepreneurs significantly impact economic activity at a more local level through fostering localized job creation, increasing wealth and local incomes, and connecting local economies to the larger global economy.

Based on the increasing awareness of the role of entrepreneurs in driving economic growth, state and local economic development efforts have been more heavily directed toward promoting entrepreneurship. These development efforts have mainly focused on reducing the financial constraints that entrepreneurs face—either through preferential loans to new businesses, as those supported by the Small Business Administration, or preferential tax treatment for new or small businesses. One such policy that has recently gained popularity aims to devote public resources toward attracting and building a larger amount of venture capital to encourage entrepreneurial activity. This development strategy is largely based on casual observation that areas with larger amounts of entrepreneurial activity generally tend to also have a larger amount of venture capital.

A recent controversial policy alternative has been popularized by Richard Florida (2002) in his book *The Rise of the Creative Class*. The author proposes that instead of focusing on developing capital inputs, development efforts should be focused toward making areas more attractive to bring in and nourish creative, entrepreneurial *individuals*. In addition, recent work by Gwartney and Lawson (2002), Farr, Lord, and Wolfenbarger (1998), Gwartney, Lawson, and Holcombe (1999), Cole (2003), and Powell (2003) highlight the role of economic freedom in promoting economic prosperity and growth. The results of this research suggest that policies consistent with expanding the economic freedom of *individuals* are the cornerstone of successful economic development policy.

In this article, we propose that the main difference between these competing development strategies is a question of the direction of causation between entrepreneurial activity and the quantity of venture capital. We then proceed to answer this question with an empirical test to determine whether it is more venture capital that causes more entrepreneurial activity in an area, or whether the presence of

more entrepreneurial activity simply, and automatically, causes more venture capital to flow into an area. Not only is this an interesting academic question, it also has significant implications for how to best direct the limited resources available for state and local economic development efforts. The basic question is whether it is better to devote development efforts toward bringing in venture funds or to encourage more entrepreneurial activity among individuals in an area (or alternatively, to attract entrepreneurs to the area) by enacting policy reform that expands economic freedom. Even more interesting is the possibility that there is causation running simultaneously in both directions between venture capital and entrepreneurial activity. If these two phenomenon have this type of relationship, development efforts will only be successful if resources are devoted *simultaneously* to promoting both larger venture funds and encouraging entrepreneurial activity among individuals.

The next section of this article proceeds to uncover the direction of causality between venture capital and entrepreneurial activity. On the basis of these results, we then consider the issue of which government policies best stimulate the underlying causal factors that promote entrepreneurship. Finally, we present concluding remarks.

Direction of Causality between Venture Capital and Entrepreneurial Activity

One variable that has been widely supported in the literature as a major determinant of entrepreneurial activity is the amount of venture capital investment that is available to entrepreneurs. The Corporation for Enterprise Development (2001) lists eight core elements of an infrastructure necessary for supporting entrepreneurship. Six of those elements revolved around the financing that was available for potential entrepreneurs. Also, highlighting the importance of financing, Henderson (2002) states that the availability of financial resources in an area, especially venture capital investment, is vital to developing entrepreneurs. However, one important idea that has generally been overlooked by previous authors is the notion that venture capital investment may be endogenous to the model of entrepreneurial activity. More specifically, it is hard to determine if the venture capital investment is creating entrepreneurship, or if the investment is simply flowing to the states that already have significant levels of entrepreneurial activity.

We perform state-level panel causality tests on venture capital investment and two measures of entrepreneurial activity (sole proprietorships and patent activity). The measure of venture capital investment is from the 2002 *Venture Capital Profiles* published by

PricewaterhouseCoopers/Thomson Venture Economics/NVCA Moneytree, and includes cash-for-equity investments by professional venture capital firms in private emerging companies in the United States, where the venture capital firm can be based, or based abroad.[1] The first measure of entrepreneurial activity, sole proprietorships, has been widely supported in the literature as a good proxy for the level of entrepreneurship.[2] The second measure of entrepreneurship, patent activity, is new to this article, and is measured as the number of utility patents (those received for general inventions or innovations) granted annually in each state. The logic behind patent activity as a measure of entrepreneurship rests in the notion that the most direct and visible outcome of the entrepreneurial process is innovation, which should be reflected in the quantity of patents.[3]

The causality test procedure used here builds on the Granger (1969) and Sims (1972) causality framework by modifying the test to incorporate the pooled time-series properties of all the 50 states. One problem that may arise in using the pooled state data is that the differences across states may be significant enough to bias the true time-series information that is available in the data. Following the approach of Blomstrom, Lipsey, and Zejan (1996) and Farr, Lord, and Wolfenbarger (1998), state intercept dummies were included in each regression specification to avoid the possible bias by controlling for any state-specific influences.[4] Specifically, the effect of the state intercept dummies is to remove the cross-sectional differences of the states, while leaving only the time-series variations to be analyzed.[5]

The general Granger-Sims causality test of two variables X and Y, modified for state panel data, can be seen in the following equations, where equation (1) tests causality running from X to Y, and equation (2) tests causality running from Y to X.

[1]Professional venture capital firms include the following types of firms: Small Business Investment Companies (SBICs), venture arms of corporations, institutions, investment banks, and similar entities whose primary activity is venture capital investing.

[2]The Bureau of Economic Analysis reports the number of sole proprietors on the basis of federal income tax forms filed by individuals of each state.

[3]Ideally, a more exhaustive indicator of innovative activities would be to measure the number of patent applications per state, but those data do not appear to exist at the state level. Griliches (1990) found that there has been a 65 percent patent application granting rate in the United States, and from 1880 to 1989, patent grants have followed closely with the trend of patent applications (see p. 1664, Figure 1). Therefore, the patent grants should be a reasonable measure of innovation in the states.

[4]The state intercept dummy parameter estimates are not reported with the causality regression results but are available on request.

[5]The Granger causality framework and the testing procedures involved are still somewhat controversial in economics. Obvious limitations to the methodology (like Christmas card sales causing Christmas) are discussed and highlighted in Bishop (1979).

$$(1) \quad Y_{t,i} = \alpha_i + \sum_{m=1}^{M} \alpha_m Y_{t-m,i} + \sum_{n=1}^{N} \alpha_n X_{t-n,i} + \varepsilon_{t,i}$$

$$(2) \quad X_{t,i} = \beta_i + \sum_{v=1}^{V} \beta_v X_{t-v,i} + \sum_{w=1}^{W} \beta_w Y_{t-w,i} + \delta_{t,i}$$

Note that the subscript *i* refers to the corresponding state observation; the error terms $\varepsilon_{t,i}$ and $\delta_{t,i}$ are assumed to be white noise; and, the number of lagged values (M and N or V and W) of the independent variables are chosen to adequately capture the relationship between X and Y.

To check for a one-way causal relationship, both directions of causality have to be investigated. In order to test if X Granger causes Y, equation (1) is estimated with and without the lagged X variables, and then an F-test is performed to test the null hypothesis that $\alpha_n = 0$ for n = 1,. . .,N. Rejecting the null hypothesis would show that X Granger causes Y. In order to test if Y Granger causes X, equation (2) is estimated with and without the lagged Y variables, and then an F-test is performed to test the null hypothesis that $\beta_w = 0$ for w = 1,. . .,W. Rejecting the null hypothesis would show that Y Granger causes X.

This modified Granger-Sims causality framework is used to run causality tests between venture capital investment, sole proprietorships, and patent activity in the United States during the 10-year period 1992–2001.[6] Descriptions of all variables used in this article, along with the sources of these data, are given in Table 1. The results of the causality tests results are presented in Table 2, and show that a one-way causal relationship exists between entrepreneurship and venture capital investment.[7] Specifically, the level of sole proprietors was found to Granger cause venture capital (specifications 1 and 3 in

[6]Due to data limitations on venture capital investment, Alaska, Hawaii, North Dakota, South Dakota, Vermont, West Virginia, and Wyoming were not included in the causality tests between entrepreneurship and venture capital investment. Also, the California observations were suppressed because standard outlier tests revealed that California is a statistical outlier in venture capital investment. Specifically, California's observations had standardized residuals that were greater than 2.5 standard deviations from the mean in absolute value.

[7]The test structure reported in Table 2 includes only one lag of the independent variables, in part, because of the limited number of observations and also to conserve on degrees of freedom. However, this one-lag relationship seems to best reflect the highly mobile characteristics of venture capital investment. It should be noted that the causality tests were run using two-and three- lags and the results were not substantially different. The only difference is that there is a weak dual-causality relation found between patent activity and venture capital investment at the 10 percent confidence level. Also, it should be noted that a more simplified t-test can be run in the causality tests that incorporate only one lag; however, the more general F-test is also acceptable.

TABLE 1

Data Description And Sources

Variable Name (Source)	Description	Mean (St. Dev.)
Causality Test Variables		
Sole proprietorship[a]	Annual nonfarm proprietors employment as revealed through income tax data	389,608 (466,830)
Patent activity[b]	Number of annual utility patents granted in the United States, which are received for all general U.S. inventions	1,028 (1,589)
Venture capital investment[c]	Venture capital investment to U.S. companies (from all sources, including non-U.S.) in millions of current dollars	426 (1,012)
Entrepreneurial Growth Variables		
Sole proprietor growth[a]	Percent change in nonfarm proprietors employment (NPE), calculated as (NPE2000 – NPE1996)/ NPE1996	10.98 (4.77)
All-government economic freedom index[d]	Composite index measure of federal, state, and local policies that affect individual economic freedom	6.68 (0.50)
All-government component 1[d]	Indicators of the size of government	7.24 (0.69)
All-government component 2[d]	Indicators of discriminatory government taxation	5.77 (0.56)
All-government component 3[d]	Indicators of labor market regulation	6.86 (0.68)
State government economic freedom index[d]	Composite index measure of state, and local policies that affect individual economic freedom	6.96 (0.67)

State government component 1[d]	Indicators of the size of government	7.21 (1.05)
State government component 2[d]	Indicators of discriminatory government taxation	6.85 (0.65)
State government component 3[d]	Indicators of labor market regulation	6.83 (0.66)
Inheritance tax law[e]	Dummy = 1 if the state levies an estate, inheritance, or gift tax beyond the federal rate	0.32 (0.47)
Percent with high school degree[f]	Percent of population receiving a high school degree as its highest level of education	82.88 (4.90)
Percent with college degree[f]	Percent of population receiving a 4-yr. college degree as its highest level of education	22.99 (4.35)
Percent males[g]	Percent of the labor force that is male	53.38 (1.19)
Percent white[g]	Percent of the labor force that is white	84.98 (11.78)
Median age[f]	Median age of the population	34.15 (1.70)
Unemployment rate[g]	Civilian unemployment rate	5.15 (1.16)
Percent service employment[g]	Percent of the labor force employed in service industries	21.48 (3.48)
Property crime rate[h]	Number of property crimes per 100,000 population	4,313 (1,040)

[a]U.S. Department of Commerce, Bureau of Economic Analysis, *State and Local Area Data,* Washington, D.C.
[b]U.S. Patent and Trademark Office, *Utility Patent Counts by Country/State and Year,* Washington, D.C., 2001.
[c]PricewaterhouseCoopers / Thomson Venture Economics / NVCA Moneytree, *Venture Capital Profile,* 2002.
[d]Karabegovic, Amela; Fred McMahon, and Dexter Samida. *Economic Freedom of North America,* 2002.
[e]CCH Incorporated, *State Estate Taxes,* 2002.
[f]U.S. Department of Commerce, Census Bureau, *Statistical Abstracts of the United States,* Washington, D.C.
[g]U.S. Department of Labor, Bureau of Labor Statistics, *State and Area Labor Force Statistics,* Washington, D.C.
[h]U.S. Department of Justice, Bureau of Justice Statistics, *FBI's Uniform Crime Reports,* Washington, D.C.

TABLE 2

Causality Test Results between State Entrepreneurial Activity and Venture Capital Investment

	Venture Capital Investment		Sole Proprietors		Patent Activity	
	(1)	(2)	(3)	(4)	(5)	(6)
Venture Capital Investment (t-1) (millions of dollars)	0.428*** (8.42)	0.214*** (4.39)	–0.441 (0.55)		0.002 (0.14)	
Sole Proprietors (t-1) (thousands of proprietors)	4.558*** (5.39)		969.335*** (72.18)	926.330*** (53.61)		1.728*** (6.15)
Patent Activity (t-1) (hundreds of patents)		146.664*** (11.60)		791.404*** (2.94)	90.124*** (23.32)	69.845*** (15.98)
Result/Finding	sole proprietors cause venture capital	patent activity causes venture capital	venture capital does not cause sole proprietors	patent activity causes sole proprietors	venture capital does not cause patent activity	sole proprietors cause patent activity
F-statistic [1, 334]	29.11***	134.66***	0.30	8.65***	0.02	37.87***
Number of Observations	378	378	378	378	378	378
R-squared	0.61	0.70	0.99	0.99	0.98	0.98

Notes: State dummy variables were included in each regression specification, and the estimated coefficients are available upon request to the authors. California was omitted as an outlier. Significance levels are represented by the following: ***1 percent, **5 percent, *10 percent; absolute t-statistics are in parentheses.

Table 2), and the level of patent activity was shown to Granger cause venture capital (specifications 2 and 5 in Table 2). Also, tests were performed to determine the direction of causality between the two measures of state entrepreneurship, and the tests revealed that dual causality exists between sole proprietors and patent activity (specifications 4 and 6 in Table 2). The dual causality result is not surprising, considering that sole proprietors and patent activity are intended to measure the same thing—the level of entrepreneurial activity.

The causality results, showing a one-way causal relationship running from entrepreneurship to venture capital investment, show that venture capital investment funds are simply flowing to states with already well-established entrepreneurial activity. One explanation of our finding is that venture capital investment is inherently more mobile than labor, which would imply that, as the level of entrepreneurial activity rises in a particular geographic region, new venture capital tends to automatically, and freely, flow from all parts of the United States, and also from areas abroad, to fund the entrepreneurial activity in that region.

It is important to note that our results do not contradict the idea that venture capital is important in the entrepreneurial process. In fact, our results are most consistent with the literature on entrepreneurial survival, which suggests that once an entrepreneurial venture is started, venture funding will significantly increase the chance of survival.[8] What our results do say, however, is that focusing development efforts on attracting more venture funding will not be an effective method of encouraging the higher levels of entrepreneurial activity necessary for economic growth. Rather, attracting and promoting underlying entrepreneurial activity must be the focus of development efforts and venture funding will automatically, and naturally, flow into the area to support this activity.

State Policies that Promote Entrepreneurship

Our empirical results from the previous section suggest that entrepreneurial activity (measured by patents and sole proprietorships) tends to be the underlying factor that attracts more venture capital to an area. The remaining question is then how to structure government policy to encourage more entrepreneurial activity among individuals in an area (either by making current residents more entrepreneurial, or by attracting new entrepreneurs to the area).

[8]Holtz-Eakin, Joulfaian, and Rosen (1994) and Blanchflower and Oswald (1998) present evidence that financing is key to the survival of entrepreneurial ventures.

One such structure for government policy is suggested by another strand of literature attempting to explain economic growth differentials across countries by differences in a well-constructed index of economic freedom. Generally, these indexes attempt to condense into a single number the degree of economic freedom individuals have in a geographic area in several key categories, such as low taxes, low regulations, and secure property rights. Studies using these indexes such as Gwartney and Lawson (2002), Farr, Lord, and Wolfenbarger (1998), Gwartney, Lawson, and Holcombe (1999), Cole (2003), and Powell (2003) have generally found that countries with a higher economic freedom score not only have larger per capita incomes, but also tend to have higher rates of economic growth.[9]

In this article, we propose that the "missing link" that has yet to be demonstrated between economic freedom and economic growth is entrepreneurial activity. That is, underlying economic freedoms generate growth primarily because they promote underlying entrepreneurial activity, which is then the source of economic growth. This hypothesis is consistent with the recent works of Baumol (1990, 2002) and Boettke (2001, 2003), who propose that the efforts of creative, entrepreneurial individuals in different countries, or areas, are directed in different ways depending on the prevailing economic and political institutions. In areas with institutions providing secure property rights, a fair and balanced judicial system, contract enforcement, and effective limits on government's ability to transfer wealth through taxation and regulation, individuals are more likely to engage in the creation of new wealth through productive market entrepreneurship. In areas without these institutions, creative individuals are more likely to engage in attempts to capture transfers of existing wealth through unproductive political entrepreneurship.

The freedom index that we use is developed by Karabegovic, McMahon, and Samida (2002), and is a composite index measure of many public policies that affect the economic freedom of individuals in that state. The authors construct two different freedom indexes. First, an index is created that reflects the policies that are put in place by federal, state, and local governments (what we refer to as the "all-government economic freedom index"). Second, an index is created that reflects the policies that are put in place by state and local governments only (what we refer to as the state and local government

[9]The idea that free-market institutions, such as secure private property rights, are vital to economic growth was also stressed in the works of Peter Bauer, see Dorn (2002) for a good discussion of Bauer's contributions in this area. Economic freedom has also been shown to be correlated with lower levels of violent conflict by Tures (2003).

economic freedom index). Furthermore, each freedom index can be broken down into three major components: (1) size of government, (2) government taxation, and (3) labor market flexibility. First, the size of government is based on general government purchases, transfer payments, and subsidies. Second, government taxation incorporates total government revenue, income tax rates and thresholds, indirect taxes, and sales taxes. Third, the labor market flexibility is based on minimum-wage earnings, government employment, occupational licensing, and union density.

To illustrate the general relationship between economic freedom and productive private-sector entrepreneurial activity, Figure 1 shows the relationship between state economic freedom scores (using the all-government economic freedom index) and the annualized growth rate of sole proprietors between 1996 and 2000. The scatter plot of the raw data is supported by a simple regression line fit between the two variables. The positive correlation can be seen clearly in the figure, which shows that the states with more economic freedom in 1996 experienced higher growth rates in entrepreneurship over the following five years. This view is highlighted by Lee (1991: 50) who writes:

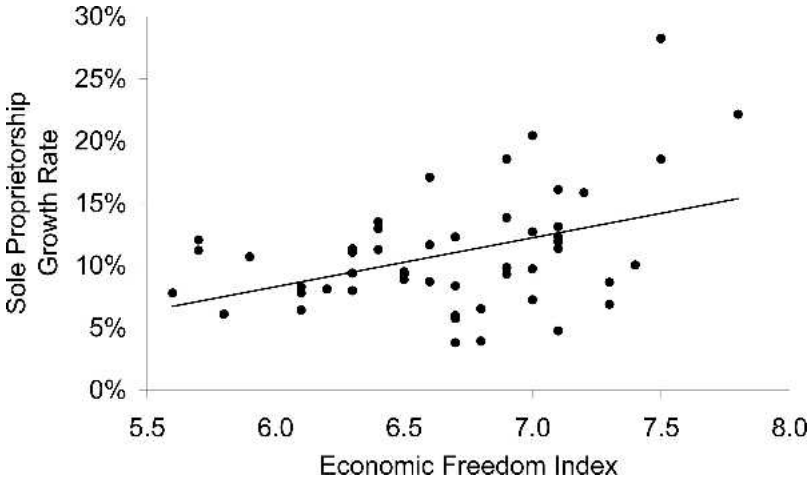
> No matter how fertile the seeds of entrepreneurship, they wither without the proper economic soil. In order for entrepreneurship to germinate, take root, and yield the fruit of economic progress it has to be nourished by the right mixture of freedom and accountability, a mixture that can only be provided by a free market economy.

To verify our hypothesis, we have gathered state-level data on the growth of entrepreneurial activity, on other key factors that have been shown to be correlated with entrepreneurial activity, and on the degree of economic freedom.

In modeling entrepreneurship, the existing literature has mainly focused on the question of what characterizes an individual entrepreneur. Our analysis is the first attempt to model environments for entrepreneurship at the state level. Also, in an attempt to stay consistent with the previous literature and to directly test whether the existing model can be applied to state-level aggregated data, our analysis will focus attention on modeling sole proprietors.

Furthermore, in order to be consistent with the earlier causality analysis, we take the values of the state explanatory variables in the initial year and see which variables significantly impact each state's growth rate of entrepreneurship over the following five years. This technique tries to get at the heart of causality by taking the existing

FIGURE 1
RELATIONSHIP BETWEEN STATE ECONOMIC FREEDOM AND GROWTH OF ENTREPRENEURIAL ACTIVITY



state characteristics at one point in time and asking what characteristics lead to entrepreneurial growth in the next period.

Generally, the formal estimated regression takes the following functional form:

$$(3) \quad SPGR_i = \beta_i + \sum_{x=1}^{X} \beta_x \, DEM_{x,i} + \sum_{y=1}^{Y} \beta_y \, POL_{y,i} + \beta_z \, FREE_i,$$

where $SPGR_i$ is the annualized growth rate of sole proprietors between 1996 and 2000 in state *I*, DEM_i is a set of demographic and economic control variables for state *I*, POL_i is a set of political variables for state *I*, and $FREE_i$ is the specified economic freedom index, or index component for state i. In an attempt to uncover the causal nature of this relationship, we use the beginning-year (1996) values for the independent variables. In other words, we attempt to see what influences were in place in the initial year (1996) that led to the rate of entrepreneurial growth that occurred over the following five years (1996 to 2000).

In determining the state control variables, we relied heavily on those variables proposed in the literature, and our underlying controls follow the approach of Bruce (2000, 2002). The variables included to

capture the demographic characteristics of entrepreneurs are population statistics on the median age, percent males, percent white, percent receiving a high school education, and percent receiving a college education. The variables included to capture the socioeconomic characteristics of the states are the unemployment rate, percent employed in service industries, and the property crime rate.

With regard to the policy variable, which is separate from the freedom index measures, we include a variable that captures those states that enacted inheritance taxes that went over and beyond the federal taxes. Holtz-Eakin, Joulfaian, and Rosen (1994) and Blanchflower and Oswald (1998) find evidence that an individual's inheritance increases the probability of entering and succeeding in an entrepreneurial venture. The reason is that inheritance often provides the seed funding necessary to develop and finance a new venture up until the point at which it becomes possible to secure outside debt or venture funding. Furthermore, Holtz-Eakin (1999), in a survey of the literature on estate taxes, concludes that entrepreneurs are more likely to bare the burden of estate taxes because they are inherently more exposed to the taxation of wealth accumulation. Thus, inheritance taxes, which directly reduce the ability of successful entrepreneurs to pass on their wealth to fund future generations of entrepreneurs, should lead to less entrepreneurial activity in states with onerous estate laws.

Also relevant to the focus of our research is the strand of literature focusing on income and payroll tax policy.[10] For example, Bruce (2000) examines income and payroll taxes of the self-employed and wage-and-salary workers to see if tax differentials affect the choice to be self-employed. The author finds that the differential tax treatment significantly affects the probability of leaving self-employment for a wage-and-salary job. Bruce (2002) extends his original work to allow for the endogeneity of individual tax rates and finds that taxes have mixed effects on the level of entrepreneurial activity. His results highlight the overall findings of the previous literature—namely, that there is no conclusive evidence on the relationship between income tax rates and entrepreneurial activity. However, one would expect that the tax environment would influence the states attractiveness to entrepreneurship.

As noted earlier, one of the propositions of this article is that a state's underlying economic freedom is an essential determinant of

[10]For a good review of the literature on the relationship between income and payroll taxes and entrepreneurship, see Bruce (2002).

the state's ability to create and attract entrepreneurial activity. Put simply, an environment of low taxes, low regulations, and secure private property rights (as measured by the economic freedom index) is what is necessary to encourage growth in entrepreneurial activity. Therefore, in all cases, the economic freedom indexes, and their components, are expected to have a positive sign showing that more economic freedom will lead to more entrepreneurial activity.

The estimated determinants of entrepreneurial growth are presented in Tables 3 and 4, which differ in that Table 3 reports the results of the estimations that incorporate the all-government economic freedom index and components, while Table 4 only reports the results of the estimations that incorporate the state and local government economic freedom index and components. Examining Tables 3 and 4, the all-government economic freedom index and the state and local index, included in specifications (1) and (2), are significant at the 1 percent level or better. Thus, the states with the most economic freedom in 1996 had the highest subsequent growth of entrepreneurial activity over the next five years, regardless of which economic freedom index we use. This result shows that state policymakers need to ensure that economic freedom exists in their state in order to promote entrepreneurial growth, which in turn naturally attracts the necessary venture capital.

Specifications (3) and (4) in both tables present the results of including the freedom index components separately. This is an interesting exercise to see which components exert stronger relative influences on the growth of entrepreneurs. At the all-government level, low government taxes are the only component that exerts a significant influence on the growth of entrepreneurship. Focusing solely on the state and local level, labor market flexibility is the only component that exerts a significant influence on the growth of entrepreneurship. It is important to point out, however, that economic freedom consists of an environment of low taxes, low regulations, and secure private property rights—and those factors may only work jointly, as seen by the overall high significance of the composite indexes and the reduced significance of the component measures. This lack of significance when all separate categories are included is also the result of the high degree of correlation among the components.

In the four specifications in which the inheritance tax is included, it is found to be significant in explaining the growth of entrepreneurial activity. Specifically, the presence of state inheritance taxes beyond the federal level exerts a negative influence on the growth of state entrepreneurial activity. These results lend support to the findings of Holtz-Eakin, Joulfaian, and Rosen (1994), Blanchflower and Oswald

(1998), and Holtz-Eakin (1999) that high inheritance taxes directly reduce the likelihood of individuals becoming entrepreneurs and also lower the reward from entrepreneurship.

The demographic control variables that were consistently significant were the median age and percent with college degree. First, the estimated influence of the median age shows that states with younger populations experienced higher entrepreneurial growth. The influence of age has had mixed results in the literature, and often the negative relation is explained by the view that older individuals may be more risk averse with regard to income. Moreover, entrepreneurial ventures are characterized by high risk and are more likely to be undertaken by younger, more risk-loving individuals. Second, the percent of the population receiving a college education is shown to exert a negative and significant influence on state entrepreneurial growth. The influence of education has also had mixed results in the literature. However, this somewhat counterintuitive result is often explained in the literature by the notion that a high school education gives an individual the basic training and understanding needed to start his or her own business without specifying a certain way of thinking or performing tasks (positive influence), while a four-year college education trains an individual to think in a more specialized field, which may be better suited for a wage-and-salary job (negative influence). The other three demographic variables (percent of population with high school degree, percent males, and percent white) are insignificant in all the regression specifications.

The economic control variables that were consistently significant were the percent service-sector employment and the property crime rate. Specifically, our results show that states with larger service sectors in their economies experience more growth in entrepreneurial activity. As noted by Blau (1987), the industries in which entrepreneurship is more common are typically the service and retail trade sectors, so the positive influence is in line with past findings. With regard to the crime rate, we find a negative influence on the growth of entrepreneurial activity. Thus, the protection of property rights is important for stimulating entrepreneurial activity. The final economic control variable, the unemployment rate, was statistically insignificant in all the regression specifications.

Taken as a whole, our results have significant policy implications for state and local development agencies. To encourage economic growth, localities must encourage entrepreneurial activity; and to do so, they must focus on creating an environment consistent with economic freedom rather than on bringing in more venture capital to the area. Again, a state's economic freedom consists of an environment of

TABLE 3

Estimated Determinants of State Entrepreneurial Growth, 1996–2000

Dependent Variable: State Sole Proprietor Growth Rates				
	(1)	(2)	(3)	(4)
State Policy Variables				
All-government economic freedom	3.784***	3.668***		
	(3.33)	(3.14)		
Component 1: Small size of government			0.253	0.083
			(0.24)	(0.08)
Component 2: Low government taxation			3.484***	2.974**
			(2.65)	(2.18)
Component 3: Labor market flexibility			1.406	1.523
			(1.54)	(1.59)
Inheritance tax law	–2.055*		–2.467**	
	(1.79)		(2.25)	
State Control Variables				
Constant	16.332	21.011	–31.857	–20.869
	(0.42)	(0.52)	(0.78)	(0.49)
Percent of population with high school diploma	–0.001	0.033	0.127	0.159
	(0.01)	(0.21)	(0.82)	(0.98)

Percent of population with college degree	−0.396**	−0.422**	−0.364**	−0.401**
	(2.23)	(2.32)	(2.11)	(2.22)
Percent of population male	−0.379	−0.508	0.054	−0.150
	(0.59)	(0.78)	(0.09)	(0.23)
Percent of population white	0.083	0.103	0.062	0.087
	(1.25)	(1.52)	(0.98)	(1.34)
Median age of population	−0.825**	−0.949**	−0.455	−0.665
	(1.99)	(2.27)	(1.07)	(1.52)
Unemployment rate	0.547	0.731	0.362	0.617
	(0.92)	(1.22)	(0.61)	(1.01)
Percent service employment	0.551***	0.595***	0.671***	0.720***
	(3.04)	(3.22)	(3.85)	(3.95)
Property crime rate	−0.001**	−0.002**	−0.001*	−0.001*
	(2.05)	(2.27)	(1.70)	(1.94)
Number of observations	50	50	50	50
R-squared	0.56	0.52	0.63	0.58

Notes: Significance levels are represented by the following: ***1 percent, **5 percent, *10 percent; absolute t-statistics in parentheses.

TABLE 4

Estimated Determinants of State Entrepreneurial Growth, 1996–2000

Dependent Variable: State Sole Proprietor Growth Rates				
	(1)	(2)	(3)	(4)
State Policy Variables				
State and local government economic freedom	3.247***	2.789***		
	(3.21)	(2.69)		
Component 1: Small size of government			0.417	0.159
			(0.47)	(0.17)
Component 2: Low government taxation			0.974	0.671
			(0.87)	(0.58)
Component 3: Labor market flexibility			2.135**	2.388**
			(2.04)	(2.22)
Inheritance tax law	–2.615**		–2.344*	
	(2.21)		(1.93)	
State Control Variables				
Constant	–14.349	–2.238	–13.897	–3.335
	(0.34)	(0.05)	(0.33)	(0.08)
Percent of population with high school diploma	0.145	0.160	0.137	0.152
	(0.85)	(0.90)	(0.79)	(0.85)

Percent of population with college degree	−0.383**	−0.408**	−0.388**	−0.411**
	(2.15)	(2.18)	(2.15)	(2.21)
Percent of population male	−0.028	−0.206	−0.027	−0.189
	(0.04)	(0.31)	(0.04)	(0.29)
Percent of population white	0.058	0.085	0.065	0.091
	(0.86)	(1.22)	(0.94)	(1.30)
Median age of population	−0.722*	−0.900**	−0.777*	−0.953**
	(1.72)	(2.08)	(1.81)	(2.20)
Unemployment rate	0.823	0.933	0.584	0.642
	(1.29)	(1.40)	(0.81)	(0.86)
Percent service employment	0.614***	0.622***	0.655***	0.714***
	(3.36)	(3.49)	(3.46)	(3.69)
Property crime rate	−0.001	−0.001*	−0.001	−0.001*
	(1.38)	(1.77)	(1.41)	(1.75)
Number of observations	50	50	50	50
R-squared	0.55	0.49	0.57	0.52

Notes: Significance levels are represented by the following: ***1 percent, **5 percent, *10 percent; absolute t-statistics in parentheses.

low taxes, low regulations, and secure private property rights, where these factors jointly work to produce economic freedom. Therefore, one component by itself will not necessarily encourage entrepreneurial activity without the other factors in place.

Conclusion

We began this article by reviewing the well-documented link between entrepreneurial activity and economic growth. Local economic development efforts have recently recognized this link and have begun to enact policies targeted at increasing entrepreneurial activity. Many localities have focused these efforts toward attracting new venture capital investment funds. The underlying, but unsubstantiated, assumption is that more venture capital will cause an increase in successful entrepreneurial activity. Recently, however, some critics have questioned whether the limited resources available for development efforts would be better directed toward attracting and nurturing individual entrepreneurs.

The state panel causality tests we perform in this article conclude that entrepreneurial activity causes an inflow of venture funding, and not vice versa. Because entrepreneurial activity tends to be the underlying factor that automatically and naturally attracts more venture capital to an area, economic development policies should focus on creating an environment attractive to individual entrepreneurs, rather than on attracting venture capital.

We gathered data across U.S. states on the growth of entrepreneurial activity in each state, other key factors that have previously been shown to be correlated with entrepreneurial activity for that state, and the degree of economic freedom in the state. Our results show that an area's degree of economic freedom significantly impacts the underlying level of entrepreneurial activity. Put simply, an environment of low taxes, low regulations, and secure private property rights is what is necessary to encourage the entrepreneurial activity that is vital to produce economic growth.

In addition to the clear implications our results have for economic development efforts, we also provide a significant contribution to the growing literature on the relationship between economic freedom and economic growth. More specifically, our results fill in the "missing link" in this well-documented relationship by showing that the conduit between economic freedom and economic growth is entrepreneurial activity. Economic freedoms generate growth primarily because they promote underlying productive private-sector entrepreneurial activity.

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