

The Effect of Personal and Economic Freedom on Entrepreneurial Activity: Evidence from a New State Level Freedom Index

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Abstract

We use a newly developed freedom index by Ruger and Sorens (2009, 2011) to examine the effect of freedom on entrepreneurship. One advantage of using this new index is that it is the first of its kind to include measures of both personal and economic freedom. This allows testing which specific type of freedom is more important for entrepreneurial growth. We find that the aggregate effect of freedom on entrepreneurial activity is positive and significant. Once we decompose the index we discover that what drives this relationship is economic freedom. Our analysis suggests that an increase of one standard deviation in the economic freedom index of a state is associated with over 100 new business starts every month for every 100,000 residents. Finally, by further decomposing the index, we find that only fiscal policy has a significant effect on entrepreneurship. This suggests that policies related to government spending and taxation can influence the allocation of entrepreneurial talent more than policies related to regulation.

Keywords: Institutions, Economic Freedom, Entrepreneur, Entrepreneurship.

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1 Introduction

The role of political institutions in promoting personal and economic freedom and determining the allocation of entrepreneurial talent is central to economic development and policy design. Although the work of Schumpeter (1942), Galbraith (1962), and Chandler (1977) have emphasized that efficiency and growth lay in the domain of large corporations, recent literature on the topic has argued that entrepreneurship is the single most important engine for job creation.¹ Baumol (2002) has even contested that innovative entrepreneurial activity is far more important for economic growth than productive efficiency. Examining the effect of political institutions on entrepreneurial growth, then, is vital to sound economic policy and sustainable development.

While economic freedom, and the political institutions that define it, has been widely acknowledged as an important source of entrepreneurship and economic development, there has been little agreement as to what actually constitutes economic freedom. Scholars have proposed a wide range of definitions, which have generated numerous measures of freedom. Most of these measures are complex composite indexes that involve multiple dimensions of social and political life.² Yet, no single measure can summarize an idea as complex as freedom. Usually, composite indicators are seen as an invitation to examine more closely the various areas that underlie them.

In this paper we use a new state level freedom index, developed by Rugers and Soren (2009, 2011), which measures both personal and economic freedom, to examine the link between political institutions and the level of entrepreneurial activity. This new measure of freedom is constructed using different variables and follows an alternative methodological approach than the Economic Freedom of North America Index (EFNA), which was

¹see Audretsch (2006) for a review of the entrepreneurship literature.

²For example, the Economic Freedom of the World Index (Gwartney et al., 2011) is constructed from 42 policy variables that are combined to produce five general areas of economic freedom.

developed by Ashby et al. (2011), and is commonly used in the literature. Thus, on the first place, our analysis serves as a robustness check on the previous studies that examine the topic. In addition, we decompose the index into its two major areas that measure economic and personal freedom separately to determine which specific type of freedom leads to entrepreneurship. While there has been significant empirical work examining the effect of economic freedom on entrepreneurial activity, the idea that personal freedom may also contribute to the productive allocation of entrepreneurial talent has not been examined thoroughly in the empirical literature. To a large degree, this is because no comprehensive measure of personal freedom has existed. Yet, authors like Richard Florida (2002) have suggested that at the most basic level, it is personal freedom that leads to creativity, innovation, and ultimately to growth.

2 Review of the literature

In a seminal essay, William Baumol (1990) argued that even if the supply of entrepreneurs in a society is fixed, the allocation of entrepreneurial talent will vary greatly because entrepreneurs can either invest their energy in a productive way (innovation) or a non-productive one (rent-seeking or organized crime). To a large extent, the end result depends on the political institutions that define "the rules of the game," or the reward structure of the economy. A society that puts high value on productivity through economic and personal freedoms will be rewarded with higher allocation of entrepreneurial energy to innovation. On the other hand, a society with a high level of political intervention, high level of taxation and regulation, will see more entrepreneurial energy devoted to non-productive activities such as rent-seeking.

A large literature has emerged since Baumol that studies what kind of political institutions promote productive entrepreneurial activity and what are the effects of productive

and non-productive entrepreneurial activity on economic development. At the national level, several studies have found a positive link between the political institutions that promote economic freedom and entrepreneurial activity. Sobel et al. (2007) find a positive relationship between economic freedom and "total entrepreneurial activity" in a country as measured by Global Entrepreneurship Monitor (Reynolds et al. 2002).³ Bjornskov and Foss (2008) disaggregate the Economic Freedom of the World Index (EFWI) and discover that sound money is positively correlated with total entrepreneurial activity. Finally, Nystrom (2008) also disaggregates the EFWI and finds that countries with smaller government, stronger legal system and rule of law, better protection of property rights, and fewer regulations have higher level of self-employment.

Similarly, several studies have examined the relationship between economic freedom and the various measures of entrepreneurship at the state level. In a seminar paper, Kreft and Sobel (2005) find that the growth rate of sole proprietorships from 1996 to 2000 is significantly affected by the earlier version of the EFNA index. Several studies have since then examined the relationship between the EFNA index and different measures of entrepreneurship. Campbell and Rogers (2007), for example, use the index to study the determinants of net business formation. In addition to finding a positive relationship, they also note that the impact of economic freedom on net business formation has more than twice the marginal effect of a similar increase in commercial lending and nearly three times the marginal effect of a similar increase in minority percentage." Similar results have been found for firm births and deaths (Campbell et al. 2008) and the Kaufmann Index of Entrepreneurial Activity (KIEA) – a state level measure of the number of business starts by non-business owning adults during the past year (Hall and Sobel 2008).

³Total entrepreneurship activity in their study is measured by the fraction of individuals in a country who are in the start-up phase of a new business or are managing a business that has been in existence for fewer than 42 months.

3 Data and Empirical Approach

3.1 Measuring Entrepreneurial Activity

Previous studies have used measures such as sole proprietorship rates and new business starts as a proxy to entrepreneurial activity. In this study, however, we follow Hall and Sobel (2008) and employ the Kauffman Index of Entrepreneurial Activity (KIEA). The index is designed and calculated by Fairlie (2011), and published annually by the Ewing Marion Kauffman Foundation. The KIEA is an important indicator of new entrepreneurial activity at the state level that measures new business starts by current non-business owners. One advantage to using KIEA is that the index is derived from the Current Population Survey (CPS) as opposed to other measures of entrepreneurship that are usually derived from payroll data. This is important because many new businesses operate for a long time before hiring new employees and thus an important entrepreneurial activity can remain hidden if based solely on payroll figures (Hall and Sobel, 2008).

For each state the KIEA measures the percent of non-business owning adults in a month who have started a business with more than 15 hours of work per week. Oklahoma, for example, had the highest KIEA score of 0.47 in 2009. This number suggests that, on average, during every month in the past year, 470 out of every 100,000 adults in Oklahoma started a new business. In contrast, Mississippi had the lowest score of 0.17 in 2009, i.e. 170 out of every 100,000 adult Mississippians started a new business every month. The significant variation of the index scores across states also makes it attractive for our analysis.

Although the KIEA exists for each state going back to 1996, limitations with respect to our data on personal and economic freedom limit us to using only the years of 2007 and 2009. The mean value of the index in 2007 was .295 while in 2009 it increased to .320. This

corresponds to nearly 10 percent increase in the aggregate level of entrepreneurial activity, which shows that the data provides variation not only across states, but also across time.

3.2 Institutional Environment

We use three different types of independent variables. The first and most important category is associated with the institutional environment. The variables for this category come from the first and second editions of the Freedom in the 50 States Index report by Ruger and Sorens (2009, 2011). Similar to other measures of economic freedom, their index measures freedom from an individual rights perspective. As the authors explain (2011, p. 5), ...individuals should be allowed to dispose of their lives, liberties, and properties as they see fit, as long as they do not infringe on the rights of others. Recognizing that individual freedom extends beyond just the economic sphere, they construct an overall measure of freedom that takes into account personal freedom as well as economic one. Table 2 in the Appendix shows the different policy variables and their relative weights that are used to calculate the two general areas of the index – personal and economic freedom. Each state is given a score for every variable based on how many standard deviations above or below the mean level it is. When aggregated into a summary index, scores have a mean of zero and are generally between plus or minus 0.50. According to this overall index, the freest states in 2009 were New Hampshire, South Dakota, Indiana, Idaho, and Missouri. The states with the lowest levels of overall freedom were Massachusetts, Hawaii, California, New Jersey, and New York.

3.2.1 Personal & Economic Freedom

Personal freedom is calculated using data on topics such as education, gun control, marriage and civil union laws, gambling, alcohol regulations, drug laws, etc. The exact

weights are also reported in Table 3A in the Appendix and are determined based on the number of people affected by the infringement as well as a subjective determination of its overall salience. Even though there is a strong relationship between personal freedom and overall freedom, the freest states in terms of personal freedom are not the freest overall. Oregon, for example, had the highest level of personal freedom in 2009, but was ranked eighth in terms of overall freedom. This is due to its relatively low ranking of economic freedom. Table 1 shows correlations between the different types of freedoms measured by the Ruger and Sorens Index of Freedom (RSIF).

Table 1: Correlation Matrix: Types of Freedom

	Personal Freedom	Regulatory Freedom	Economic Freedom	Overall Freedom
Personal Freedom	1.00			
Regulatory Freedom	0.27	1.00		
Economic Freedom	0.19	0.78	1.00	
Overall Freedom	0.56	0.76	0.92	1.00

3.2.2 Fiscal & Regulatory Freedom (Decomposing Economic Freedom)

In constructing their economic freedom rankings for each state, Ruger and Sorens (2009) first create scores and rankings in two separate areas: fiscal policy and regulatory policy. Fiscal policy is comprised of spending and taxation, while regulatory policy includes data on labor regulation, occupational licensing, land use, etc. Both areas are weighted equally in calculating the overall economic freedom score. According to the authors, South Dakota was the most economically free state in 2009, with New Hampshire, North Dakota, Idaho, and Virginia also in the top five. By way of comparison, Ashby et al. (2011) find that the most economically free states at the sub-national level are South Dakota, Delaware, Tennessee, and Virginia.

Finally, Table 2 shows that the RSFI has no correlation to the Ashby et al.(2011) index,

which is the index that has been used exclusively in the literature. Thus, it is interesting to see if using a different measure of economic freedom will be consistent with the findings of previous studies that examine the link between economic freedom and entrepreneurship.

Table 2: Correlation Matrix - Alternative Measures of Freedom

	<i>EFNA - Federal</i>	<i>EFNA - State</i>	<i>Economic Freedom</i>	<i>Personal Freedom</i>
EFNA* - Federal	1.00			
EFNA* - State	0.75	1.00		
Economic Freedom	-0.01	0.02	1.00	
Personal Freedom	0.44	0.75	0.19	1.00

* Economic Freedom of North America (EFNA)

One drawback to the RSFI is that it has only been calculated for 2007 and 2009. This limits our analysis to a pooled cross section data set with only two observations for each state.

3.3 State Controls

In addition to the institutional variables, we include a set of state specific controls that might influence entrepreneurship. These variables include unemployment rate, population density, percent of service employment, and property and violent crime rate. Our choice of these economic variables is informed by the following literature. Rosenthal and Ross (2011) find that entrepreneurs in retail, wholesale and restaurants are less abundant in locations with higher rate of violent crime. Kreft and Sobel (2005) find a positive relationship between service employment and sole proprietorship growth rate. Sato et al. (2012) show that a 10 percent increase in the population density increases the percentage of people who want to become entrepreneurs by one percent. Finally, Blanchflower (2000) finds a negative relationship between self-employment and the unemployment rate across a large sample of OECD countries. Although, Carree (2002) does not find a significant relationship between

the unemployment rate and the number of new business starts at the state level.

3.4 Characteristics of Entrepreneurs

Finally, we also include a set of variables to control for different characteristics of entrepreneurs. These variables include the percentage of the labor force that is male and white, the percentage of individuals over the age of 25 with a four-year college degree, and median age. These variables have been previously found to affect the level of entrepreneurial activity (see Kreft and Sobel, 2005; Hall and Sobel 2008). Men, for example, are more likely than women to become entrepreneurs (Langowitz and Minniti 2007). Gohmann (Forthcoming) finds a positive relationship between the level of education and self-employment.

Table 1A in the Appendix summarizes all of the variables used in our analysis. Precise definitions and sources of the data are available in Table 2A.

4 Empirical Strategy & Results

4.1 Preliminary Investigation

Figure 1 provides some initial evidence in favor of a positive relationship between overall freedom and entrepreneurship. On the vertical axis we plot the KIEA, which is our measure for entrepreneurship, and on the horizontal axis we plot the RSFI, which is used to measure overall freedom. The data in Figure 1 includes observations for both 2007 and 2009. While the raw scatter plot does not show a clearly positive relationship, a linear trend line reveals a positive link between overall freedom and entrepreneurship. Figures 2 and 3 show a similar relationship for personal freedom and economic freedom, respectively.

In addition, Table 3 reports the results from several parsimonious specifications in

Figure 1: Overall Freedom and Entrepreneurship

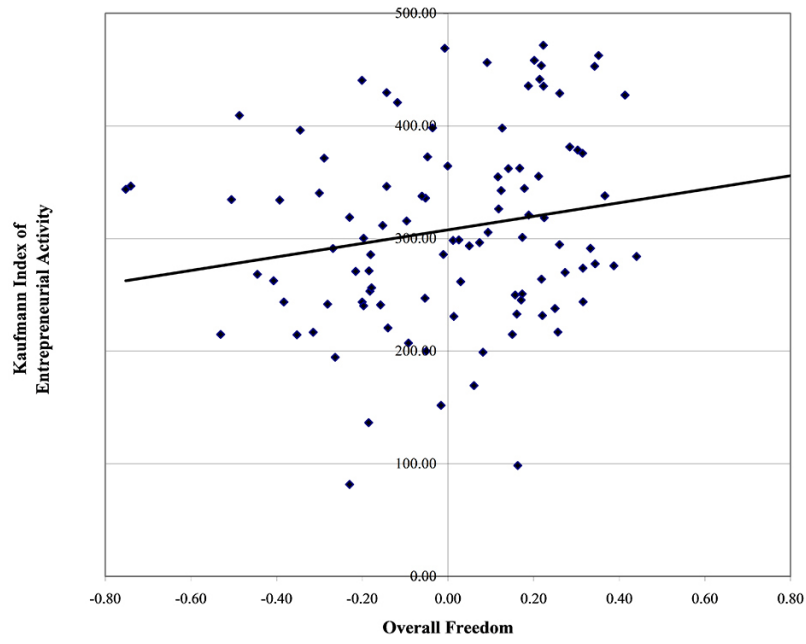


Figure 2: Economic Freedom and Entrepreneurship

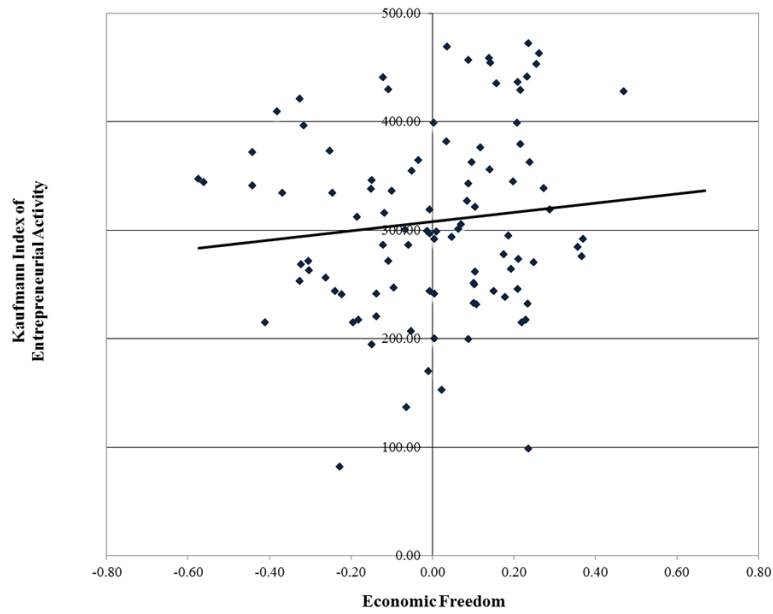
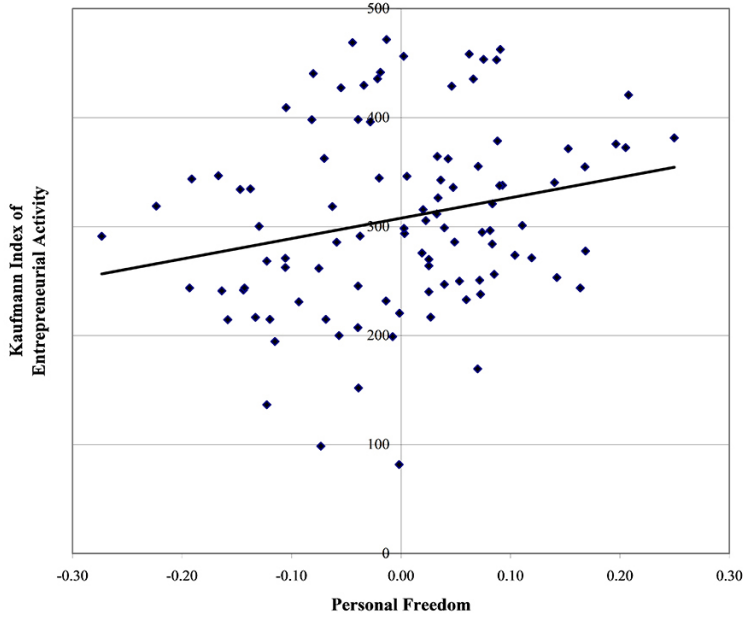


Figure 3: Personal Freedom and Entrepreneurship



which the only explanatory variable is the aggregate measure of freedom of the RSFI, or one of the two sub-components of the index—economic or personal freedom. We do this in order to get a sense of the baseline relationship between the RSFI and KIEA. As expected the relationship is positive for all types of freedom, but only the overall effect of freedom on entrepreneurial activity is statistically significant. In the next section we introduce our

Table 3: Parsimonious Regressions

Variables	Overall Freedom	Personal Freedom	Economic Freedom
Constant	307.74 *** (5.44)	307.74 *** (5.55)	307.74 *** (5.50)
Measure of Freedom	282.72 * (159.66)	297.48 (278.36)	286.56 (203.17)
R-sq Adjusted	0.03	0.05	0.01

Note: Dependent Variable: Kauffman Index of Entrepreneurial Activity; * indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level. Standard errors are reported in parentheses.

full specification and provide further analysis, including investigation of nonlinear effects.

4.2 Basic Model

We continue our empirical analysis by estimating the aggregate effect of freedom on entrepreneurial activity with the following model:

$$KIEA_{it} = \beta_0 + \beta_1 FREE_{it} + \gamma X'_{it} + h_i + \varepsilon_{it} \quad (1)$$

where $KIEA_{it}$ is the index of entrepreneurial activity for state i in year t , $FREE_{it}$ is the aggregate index of freedom, X_{it} is a vector of control variables described in Table 1A in the appendix, h_i is a fixed-effects estimator that measures unobserved differences across states, and ε_{it} is an i.i.d. error term. By including the h_i term in the model, we try to avoid potential omitted variable bias due to interstate variation. For example, variables related to culture and geographical characteristics that are not included in the regression may explain some of the differences in entrepreneurial activity across states. Thus, an important assumption of our model is that the error term is uncorrelated with the unobserved fixed-effect over time. This seems a reasonable assumption since both culture and geographical characteristics are to a great degree time invariant.

Table 4 reports the results from three separate variations of our basic model. In the first model (1), we introduce the state controls—population density, unemployment rate, the size of the service sector, and violent and property crime rates—and the variables that control for entrepreneurs characteristics—the proportion of the population that is white and male, and the state’s median age. As expected, overall freedom is both positive and statistically significant at the .1 level. The coefficient on overall freedom suggests that a state increasing its overall freedom score by one standard deviation (0.26) should experience an increase of approximately 42 (158.69×0.26) new business starts every month for every

100,000 non-business owners. This is nearly 50 percent of a standard deviation in the KIEA index, or enough to turn Mississippi (the state with the lowest entrepreneurship rate in 2009) into Alabama (214 new businesses per 100,000 adults a month). All of the other explanatory variables have the expected sign, with the exception of the variable that measures employment in the service sector, which was expected to be positive based on the work of Kreft and Sobel (2005). The signs on both crime variables are positive and consistent with Rosenthal and Ross (2010), but only violent crime is statistically significant at the .01 level. With the exception of population density, no other explanatory variables are statistically significant. On overall, the model explains 43 percent of the variation in the KIEA across states.

Table 4: The Aggregate Effect of Economic Freedom on Entrepreneurship

Dependent Variable: KIEA	(1)		(2)		(3)				
Overall Freedom	151.69	(1.82)	*	270.75	(152.59)	*	304.90	(474.10)	
Freedom Squared				228.76	(295.72)				
Real Median Income							0.00	(0.00)	
Freedom * Real Median Income							0.00	(0.01)	
Percent Male	2887.94	(1875.10)		3297.11	(1957.41)		2652.76	(1943.49)	
Median Age	1.10	(21.97)		3.63	(22.33)		-1.18	(23.02)	
Percent White	-1294.13	(1244.56)		-1356.96	(1253.49)		-1267.10	(1279.24)	
Population Density	9.09	(4.31)	*	8.96	(4.33)	**	8.81	(4.40)	*
Unemployment Rate	10.72	(9.63)		9.55	(9.80)		9.91	(10.10)	
Percent Service Employment	-411.05	(841.73)		-313.51	(855.33)		-563.83	(883.80)	
Percent with Bachelors Degree	665.59	(2150.09)		380.00	(2192.27)		497.18	(2204.65)	
Property Crime Rate	0.08	(0.06)		0.07	(0.06)		0.10	(0.07)	
Violent Crime Rate	0.93	(0.34)	*	0.92	(0.35)	**	0.91	(0.35)	**
Constant	-2153.62	(2125.04)		-2380.98	(2155.91)		-1663.86	(2294.02)	
R-squared	0.43			0.44			0.44		

Note: Dependent Variable: Kauffman Index of Entrepreneurial Activity; * indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level. Standard errors are reported in parentheses. Number of observations: 100, Years = 2007, 2009. Number of States = 50. All models are jointly significant at the .0 level. R squared values report the within variation.

Table 4 also summarizes the results from two additional models that are included to test

for non-linear effects. Following Wennekers et al.(2010), we assume that the relationship between economic development and the level of entrepreneurship can follow a U-curve. If political institutions, however, are positively correlated with economic development, then the relationship between freedom and entrepreneurship might also be nonlinear.⁴ Thus, we include a square term of aggregate freedom in the regression in (2). However, the term neither has the expected sign, nor is statistically significant at the .1 level. In model (3), we further test for non-linear effects following Bjornskov et al.(2008), who argue that the effect of institutions depends on the level of economic development. Using state level data on real median household income as a proxy for economic development, we include an interaction variable between freedom and income to control for possible non-linear effects. Again, we don't find evidence for non-linearity. However, it is possible that the non-linear effect discussed in the literature is a long-run phenomenon and our data, which covers only two years, does not provide enough variation to test successfully this hypothesis.

4.3 Decomposing the Index

Next, we decompose the overall freedom index and use the following specification:

$$KIEA_{it} = \beta_0 + \sum_j \beta_j FREE_{it}^j + \gamma X'_{it} + h_i + \varepsilon_{it} \quad (2)$$

where $FREE_{it}^j$ is the economic freedom measure, j , and the other variables are the same as in the previous model.

Tables 5 provides summary of three variations of this specification. In the first model we test which specific type of freedom—personal or economic—leads to entrepreneurship. We find that only economic freedom has a positive and statistically significant effect on the level of entrepreneurial activity. The coefficient of 489.10 suggests that an increase of one

⁴see Hall and Sobel (2008) for a discussion of non-linear relationships in entrepreneurship.

standard deviation in the economic freedom score of a state is associated with the start of 106 new businesses every month per 100,000 residents (482.99×0.22). This is more than one standard deviation increase in the KIEA scores across our whole sample. This result is not surprising given the large body of previous research that finds similar relationship.⁵ However, the variable on personal freedom has a negative sign and is statistically insignificant, which suggests that it is economic freedom that drives the positive and significant relationship between aggregate freedom and entrepreneurship. The negative sign should be interpreted with caution since the 95 percent confidence interval also includes a wide range of positive values. These results should not be taken to suggest that the individual rights embodied in the measure of personal freedom are not important. Rather, it is possible that personal freedom affects entrepreneurship not directly but through channels such as education. For example, Sobel and King (2008) show that educational choice, which is one of the policy variables used to determine personal freedom, is positively related to youth entrepreneurship.

In the second model (2), we substitute our measure for economic freedom with the EFNA index in order to examine if the choice of freedom measure will change our results in any significant way. The results from this alternative specification are consistent with the findings of our previous model—economic freedom has a strong and positive effect on entrepreneurship while personal freedom is found to be statistically insignificant again. These results suggest that the findings of the previous literature on the topic, e.g., Hall and Sobel (2008), are robust with respect to the measure of economic freedom that is used.

One advantage of the RSFI is that it incorporates measures of regulation into the

⁵In the working version of this paper, we also test for non-linearity by including square terms on the different measures of freedom, and interaction terms with the median level of income, which is our proxy for economic development, but don't find evidence for the presence of such effect. We don't rule out the possibility of nonlinearity due to our limited sample, which spans only two years. Rather, our results suggest that the nonlinear effect may be a long-run phenomenon.

Table 5: Decomposing the Effects of Economic Freedom on Entrepreneurship

Dependent Variable: KIEA	(1)		(2)		(3)			
Personal Freedom	-35.88	(271.30)		174.67	(275.77)			
Economic Freedom	489.10	(215.71)	**					
EFNA				24.28	(14.18)	*		
Fiscal Freedom							567.50	(267.65) **
Regulatory Freedom							327.33	(370.77)
Percent Male	3370.22	(1887.15)	*	2731.16	(1990.88)		3544.61	(1864.01)
Median Age	-13.40	(24.14)		6.91	(22.52)		-13.96	(23.30)
Percent White	-1421.72	(1234.30)		-1201.40	(1260.39)		-1296.60	(1252.87)
Population Density	10.70	(4.42)	**	7.67	(4.34)	*	10.11	(4.47)
Unemployment Rate	14.75	(9.97)		10.10	(9.92)		14.42	(9.70)
Percent Service Employment	-711.60	(860.54)		59.44	(895.93)		-737.51	(845.70)
Percent with Bachelors Degree	1335.55	(2181.24)		-278.13	(2145.86)		1601.42	(2240.38)
Property Crime Rate	0.10	(0.06)		0.05	(0.06)		0.10	(0.06)
Violent Crime Rate	1.07	(0.36)	***	0.85	(0.36)	**	1.00	(0.36) ***
Constant	-2041.66	(2103.14)		-2365.94	(2146.81)		-2121.74	(2102.42)
R-squared	0.44			0.42			0.44	

Note: Dependent Variable: Kauffman Index of Entrepreneurial Activity; * indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level. Standard errors are reported in parentheses. Number of observations: 100, Years = 2007, 2009. Number of States = 50. All models are jointly significant at the .0 level. R squared values report the within variation.

definition of economic freedom. Half of the economic freedom measure is determined by the effect of regulatory policy and the other half of fiscal one. This allows researchers to better study the impact of the type of government policies that affect entrepreneurship by building off the work done at the international level by Klapper et al.(2006). Thus, in model (3) we further decompose the economic freedom sub-index into its major policy areas: fiscal and regulatory policy. The results, which are also reported in Table 5, show that fiscal policy is more important to entrepreneurship than regulatory one. The coefficient on fiscal policy is both positive and statistically significant at the .05 level. While regulatory policy is positively correlated with KIEA, it is not statistically significant. The results suggest that one standard deviation improvement in the fiscal policy score of a state will result in the creation of 87 new business starts per month for every 100,000 residents. Given the large number of regulatory policies included in the regulatory policy index, however, it is possible that regulations in some areas of the index are more relevant to entrepreneurship than others, and further investigation of this topic is necessary before conclusive results can be reached. An important implication of our findings is that government policy affecting public spending and taxation can have a more profound effect on entrepreneurship than regulatory policy.

5 Conclusion

Entrepreneurship is one of the most important sources of economic growth (Holcombe 1998; Holcombe 2003; Audretsch et al. 2006). Over the past decade a large body of empirical research has confirmed this relationship with evidence from the former Soviet Union (Berkowitz and DeJong 2005) and the United States (Bruce et al. 2009, Samila and Sorenson 2011). In this paper we study to what extent the political institutions that define the aggregate level of freedom affect entrepreneurship. We use a new index of

freedom developed by Rugers and Sorens (2009, 2011), which accounts for both personal and economic freedom. This allows us to not only test the consistency of the findings of previous research, but also to decompose the index and examine which specific types of freedom—personal or economic—lead to entrepreneurship.

We find that the overall effect of freedom on entrepreneurial activity is positive and statistically significant. Once we disaggregate the index into its personal and economic freedom, however, we discover that only economic freedom has a significant impact on the level of entrepreneurial activity. All else constant, we find that one standard deviation increase in the economic freedom index of a state is associated with the creation of more than 100 business starts per month for every 100,000 individuals. We do not find evidence that personal freedom affects the level of entrepreneurial activity in any significant way. Finally, we examine the two major areas of economic freedom—fiscal and regulatory policy—and find that fiscal policy has a much stronger effect on entrepreneurship. We conclude that government policies which relate to spending and taxation are a far more potent tool in determining the allocation of entrepreneurial talent than are regulatory policies.

References

- [1] Ashby, N., A. Bueno, and F. McMahon. 2011. *Economic Freedom of North America: 2011*. Vancouver: Fraser Institute.
- [2] Audretsch, D., M. Keilbach and E. Lehmann. 2006. *Entrepreneurship and Economic Growth*. New York: Oxford University Press.
- [3] Baumol, W. 1990. Entrepreneurship: Productive, Unproductive, and Destructive. *Journal of Political Economy* 98(5): 893-921.
- [4] Berkowitz, D., and D. DeJong. 2005. Entrepreneurship and Post-socialist Growth. *Oxford Bulletin of Economics and Statistics* 67(1): 25-46.
- [5] Bjrnskov, C., and N. Foss. 2008. Economic Freedom and Entrepreneurial Activity: Some Cross Country Evidence. *Public Choice* 134: 307-328.

- [6] Blanchflower, D. 2000. Self-employment in OECD Countries. *Labour Economics* 7(5): 471-505.
- [7] Bruce, D., J. Deskins, B. Hill, and J. Rork. 2009. Small Business Activity and State Economic Growth: Does Size Matter? *Regional Studies* 43(2): 229-245.
- [8] Campbell, N., and T. Rodgers. 2007. Economic Freedom and Net Business Formation. *Cato Journal* 27(1): 23-36.
- [9] Campbell, N., T. Rodgers and K. Heriot. 2007-08. The Economic Freedom Index as a Determinant of Firm Births and Firm Deaths. *Southwest Business and Economics Journal* 16: 37-50.
- [10] Carree, Martin. 2002. Does Unemployment Affect the Number of Establishments? A Regional Analysis for U.S. States. *Regional Studies* 36(4): 389-398.
- [11] Chandler, Alfred. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge, MA: Belknap, 1977. Print.
- [12] Fairlie, R. 2011. *Kauffman Index of Entrepreneurial Activity: 1996-2010*. Kansas City, MO: Ewing Marion Kauffman Foundation.
- [13] Florida, Richard. *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*. Basic Books. January 2004.
- [14] Gohmann, S. Forthcoming. Institutions, Latent Entrepreneurship, and Self-Employment: An International Comparison. *Entrepreneurship Theory and Practice*.
- [15] Gwartney, J., R. Lawson, and J. Hall. 2011. *Economic Freedom of the World: 2011 Report*. Vancouver: Fraser Institute.
- [16] Hall, J., and R. Sobel. 2006. *Public Policy and Entrepreneurship*. Kansas City, MO: Center for *Applied Economics*.
- [17] Hall, J., and R. Sobel. 2008. Institutions, Entrepreneurship, and Regional Differences in Economic Growth, *Southern Journal of Entrepreneurship* 1(1): 69-96.
- [18] Holcombe, R. 1998. Entrepreneurship and Economic Growth. *Quarterly Journal of Austrian Economics* 1(2): 45-62.
- [19] Klapper, L., L. Laeven, and R. Rajan. 2006. Entry Regulation as a Barrier to Entrepreneurship. *Journal of Financial Economics* 82(3): 591-629.
- [20] Kreft, S., and R. Sobel. 2005. Public Policy, Entrepreneurship, and Economic Freedom, *Cato Journal* 25(3): 595-616.

- [21] Langowitz, N., and M. Minniti. 2007. The Entrepreneurial Propensity of Women. *Entrepreneurship Theory and Practice* 31(3): 341-364.
- [22] North, D. 1991. Institutions. *Journal of Economic Perspectives* 5(1): 97-112.
- [23] Nyström, K. 2008. *The Institutions of Economic Freedom and Entrepreneurship: Evidence from Panel Data*. Public Choice 136(3): 269-282.
- [24] Reynolds, R., W. Bygrave, A. Erkkö, and M. Hay. 2002. *Global Entrepreneurship Monitor*. Kansas City, MO: Ewing Marion Kauffman Foundation.
- [25] Rosenthal, S., and A. Ross. 2010. *Violent Crime, Entrepreneurship, and Cities*. Journal of Urban Economics 67(1): 135-149.
- [26] Ruger, W., and J. Sorens. 2009. *Freedom in the 50 States: An Index of Personal and Economic Freedom*. Arlington, VA: Mercatus Center at George Mason University.
- [27] Ruger, W., and J. Sorens. 2011. *Freedom in the 50 States: An Index of Personal and Economic Freedom*, 2nd edition. Arlington, VA: Mercatus Center at George Mason University.
- [28] Samila, S., and O. Sorenson. 2011. Venture Capital, Entrepreneurship and Economic Growth. *Review of Economics and Statistics* 93(1): 338-349.
- [29] Sato, Y., T. Tabuchi, and K. Yamamoto. 2012. Market Size and Entrepreneurship. *Journal of Economic Geography*, forthcoming.
- [30] Schumpeter, J.A.(1942, 1975), *Capitalism, Socialism, and Democracy*. Harper& Row: New York.
- [31] Sobel, R., J. Clark, and D. Lee. 2007. Freedom, Barriers to Entry, Entrepreneurship, and Economic Progress. *Review of Austrian Economics* 20(4): 221-236.
- [32] Sobel, R., and K. King. 2008. Does School Choice Increase the Rate of Youth Entrepreneurship? *Economics of Education Review* 27(4): 429-438.
- [33] U.S. Census Bureau. 2012. *Statistical Abstract of the United States*. Washington: Government Printing Office.
- [34] U.S. Department of Justice. 2010. *Crime in the United States, 2009*. Washington, DC: U.S. Department of Justice Federal Bureau of Investigation.
- [35] U.S. Department of Labor. 2011. Local Area Unemployment Statistics. Available online at: <http://www.bls.gov/lau/tables.htm>

A Appendix

Table 1A: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
Kauffman Index	100	307.75	85.41	81.66	471.72
Measures of Freedom					
Overall Freedom	100	-5.59E-10	0.26	-0.75	0.44
Personal Freedom	100	-2.25E-10	0.10	-0.27	0.25
Economic Freedom	100	-3.75E-10	0.22	-0.57	0.47
Fiscal Freedom	100	4.14E-10	0.15	-0.48	0.35
Regulatory Freedom	100	-2.61E-10	0.10	-0.24	0.16
Other Control Variables					
Real Median Income	100	50959.29	7657.92	35078	70282.27
Percent Male	100	0.53	0.01	0.50	0.57
Median Age	100	37.75	2.39	28.46	43.40
Percent White	100	0.83	0.13	0.20	0.97
Population Density	100	162.11	201.40	1.03	998.45
Unemployment Rate	100	6.37	2.59	2.70	13.60
Percent Service Employment	100	0.75	0.05	0.67	0.88
Percent with Bachelors Degree	100	0.17	0.03	0.10	0.23
Property Crime Rate	100	3052.02	693.22	1652.30	4414.00
Violent Crime Rate	100	394.75	171.14	118.00	788.30

Table 2A: Summary Statistics and Data Sources of Variables

Variable	Definition	Source
KIEA	Number of Entrepreneurs per 100,000 people	Kauffman Index of Entrepreneurial Activity
EFNA	Economic Freedom of North American Index Score	Economic Freedom of North America
Overall Freedom	Overall Freedom Index Score	Freedom in the 50 States: Index of Personal and Economic Freedom
Personal Freedom	Personal Freedom Index Score	Freedom in the 50 States: Index of Personal and Economic Freedom
Economic Freedom	Economic Freedom Index Score	Freedom in the 50 States: Index of Personal and Economic Freedom
Fiscal Freedom	Fiscal Freedom Index Score	Freedom in the 50 States: Index of Personal and Economic Freedom
Regulation Freedom	Regulation Freedom Index Score	Freedom in the 50 States: Index of Personal and Economic Freedom
Real Median Income	Real Median Household Incomein 2009 dollars	US Census Bureau
Percent Male	Percentage of labor force that is male	Bureau of Labor Statistics
Median Age	Median age of the total population	US Census Bureau
Percent White	Percentage of labor force that is white	Bureau of Labor Statistics
Population Density	Person per square mile of land	US Census Bureau
Unemployment Rate	Percentage of the labor force that is unemployed	Bureau of Labor Statistics
Percent Service Employment	Percent of labor force in the service sector	Bureau of Labor Statistics
Percent with Bachelors Degree	Percent of the population that has at most bachelor's degree	US Census Bureau
Property Crime Rate	Number of property crimes per 100,000 people	FBI Uniform Crime Reports
Violent Crime Rate	Number of violent crimes per 100,000 people	FBI Uniform Crime Reports

Table 3A: Concept, Issue Category and Variable Weights for Freedom in the 50 States Index

Fiscal Policy: 25%, of which:	
<i>Spending: 50%, of which:</i>	
	Grants-adjusted spending: 16.67%
	Adjusted spending minus current charges: 8.33%
	Total spending: 16.67%
	Spending minus charges: 8.33%
	Population-adjusted fiscal decentralization: 25%
	Local-government budget constraints: 6.25%
	Grants-adjusted government employment: 9.38%
	Total government employment: 9.38%
<i>Taxation: 50%, of which:</i>	
	State and local debt: 25%
	Nonfuel, nonseverance tax revenues: 75%
Regulatory Policy: 25%, of which:	
<i>Labor regulation: 26.2%, of which:</i>	
	Minimum wage: 21%
	Right-to-work laws: 26%
	Short-term disability insurance: 12%
	State OSHA: 2%
	Prevailing-wage law: 4%
	Workers'-compensation coverage regulations: 12%
	Workers'-compensation funding regulations: 4%
	Paid family leave: 12%
	Employer verification of legal status: 6%
	Smoker-protection laws: 1%
<i>Health insurance: 26.2%, of which:</i>	
	Individual guaranteed issue: 8.57%
	Community rating, small groups: 11.43%
	Community rating, individuals: 11.43%
	Individual policies, elimination riders banned: 4.29%
	COBRA continuation, small firms: 1.43%
	Group conversion coverage, small firms: 1.43%
	Group conversion rating limits: 1.43%
	Mandated external grievance review: 1.43%
	Financial incentives to providers banned: 2.86%
	Direct access to specialists mandated: 4.29%
	High-risk health-insurance pool: 1.43%
	Standing referrals mandated: 2.86%
	Licensing of health-plan medical directors: 1.43%
	Health-insurance coverage mandates index: 28.57%
	Individual health-insurance mandate: 17.14%
<i>Occupational licensing: 14%</i>	
<i>Eminent domain: 10.72%</i>	
<i>Liability system: 14%</i>	

Appendix Table 2 continued

Regulatory Policy: 25%, of which:	
<hr/>	
<i>Land-use regulation: 5.36%, of which</i>	Strength of state planning role: 4.76%
	Regulatory-taking restrictions: 14.29%
	Guidelines for state development plan: 19.05%
	Mandated local plans: 9.52%
	Internal-consistency mandate: 4.76%
	Vertical-consistency mandate: 38.1%
	Horizontal-consistency mandate: 9.52%
<i>Utility restructuring: 3.56%, of which:</i>	
	Natural gas: 33.33%
	Telecom: 33.33%
	Cable: 33.33%
Paternalism: 50%, of which:	
<i>Gun control: 13.33%</i>	
<i>Marijuana laws: 11.67%, of which:</i>	
	Legal marijuana possession: 15%
	Decriminalized possession: 15%
	High-level possession misdemeanor: 15%
	Low-level cultivation misdemeanor: 15%
	Mandatory minimums: 15%
	Medical-marijuana exception: 6.25%
	Maximum possible sentence: 15%
<i>Asset-forfeiture rules: 7.2%</i>	
<i>Arrests for victimless crimes: 8.12%, of which:</i>	
	Arrests for nondrug victimless crimes, % of population: 25%
	Arrests for nondrug victimless crimes, % of all arrests: 25%
	Drug law-enforcement rate: 50%
<i>Tobacco regulations: 6%, of which:</i>	
	Cigarette-tax per pack: 41.25%
	Smoking ban, restaurants: 18.75%
	Smoking ban, bars: 18.75%
	Smoking ban, workplaces: 18.75%
	Regulations, vending machines: 1.25%
	Regulations, Internet purchases: 1.25%
<i>Alcohol regulations: 4.8%, of which:</i>	
	Alcohol-distribution index: 29.41%
	Keg regulations: 3.92%
	Server training: 3.92%
	Beer taxes: 13.73%
	Wine taxes: 13.73%
	Spirits taxes: 13.73%
	Blue laws: 17.65%
	Happy-hour laws: 3.92%

Appendix Table 2 continued

Paternalism: 50%, of which:	
<i>Auto and road regulations: 6%, of which:</i>	
	Seatbelt enforcement: 33.33%
	Motorcycle-helmet laws: 8.33%
	Bicycle-helmet laws: 5.56%
	Cell-phone driving ban: 5.56%
	Open-container law: 2.78%
	Sobriety checkpoints authorized: 33.33%
	Un/underinsured-motorist insurance required: 2.78%
	Personal-injury insurance required: 8.33%
<i>Gambling laws: 3.12%, of which:</i>	
	Social-gaming exception: 3.33%
	Gambling felony: 20%
	Internet-gaming prohibition: 16.67%
	Track gaming: 5%
	Casino gaming: 5%
	Pari-mutuel wagering: 5%
	Charitable gaming: 5%
	Slots gaming: 5%
	Sports betting: 5%
	Gaming revenues: 30%
<i>Mala prohibita and civil liberties: 8.7%, of which:</i>	
	Raw-milk sales legal: 3.57%
	Fireworks ban: 7.14%
	Prostitution legal: 32.14%
	Physician-assisted suicide legal: 25%
	Religious Freedom Restoration Act: 7.14%
	DNA taken from arrestees: 10.71%
	Trans-fat bans: 7.14%
	Two-party consent for recording: 7.14%
<i>Marriage and civil-union laws: 8.12%, of which:</i>	
	Same-sex partnerships recognized: 95.24%
	Blood test requirement: 2.38%
	Total waiting period: 2.38%
<i>Education: 16.46%, of which:</i>	
	Tax credit/deduction: 9.09%
	Compulsory schooling years: 9.09%
	Mandatory kindergarten: 9.09%
	Private-school registration: 6.06%
	Private-school approval requirement: 12.12%
	Private-school teacher licensure: 12.12%
	Private-school curriculum control: 6.06%
	Homeschooling law: 3.03%
	Homeschooling curriculum control: 6.06%
	Homeschooling teacher licensure: 9.09%
	Homeschooling standardized testing: 9.09%
	Homeschooling notification requirements: 4.55%
	Homeschooling recordkeeping requirements: 4.55%

Appendix Table 2 continued

Paternalism: 50%, of which:

Public financing:	18.18%
Individual contributions to candidates:	15.91%
Individual contributions to parties:	15.91%
Grassroots PAC contributions to candidates:	15.91%
Grassroots PAC contributions to parties:	15.91%
Corporate contributions to candidates:	9.09%
Corporate contributions to parties:	9.09%
