The impact of state competitiveness on firm formation

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ABSTRACT

Successful entrepreneurs are keen to spot profit opportunities. They then take actions in response to these opportunities by creating new firms in where the opportunities can offer the most to them or work the best for them. This paper examines the dimensions that contributed to the competitiveness of a state and how significant each of them is in new firm formation. Regressing the three entrepreneurial activity measures related to new firm formation (entry rate, business density and entry per thousand of active population) individually on the eight dimensions covered in the BHI's Competitive Index (including government and fiscal policies, security, infrastructure, human resources, technology, business incubation, openness and environment policy) at the state level, it is found that security and technology do not have any significant impact on new firm formation. The remaining six dimensions have either significantly positive or negative association with one or more of the three entrepreneurial activity measures.

Keywords: firm formation, competitive index, entrepreneur, GDP, population

1. INTRODUCTION

Entrepreneurship, which is defined as the combination of the various efforts an individual or group of individuals made to set off an economic activity, in the form of creating a legal entity commonly known as a business firm operated within a formal sector, has been considered very important for the ongoing viability of modern economies and for the creation of jobs. In addition, a business firm can have one or more establishment(s). In other words, an entrepreneur can set up one or more establishment(s) for the same firm and hire people to work at each establishment. Because of this, it should be on the very top of the priority list of policymakers to know how new firms get started in order to maintain or enhance the economic growth of the place. Moreover, policymakers must know what financial and institutional factors might promote such entrepreneurial activity.

Recent research has found significant relationships between entrepreneurial activity (in the form of firm formation) in a country and certain indicators related to its economic and financial development and growth, its quality of legal and regulatory environment as well as its governance (Klapper, 2006 and Klapper, Amit, Guillen, & Quesada, 2007). Prior studies on entrepreneurship mainly focus on the global level – on the industrial world, specific regions or the globe as a whole (Audretsch, 1995; Feldman, 2001; Klapper, 2006 and Klapper et al., 2007). There is not such a study investigating at the state level of a country on whether the competitiveness of a state will affect the firm formation of the state. This paper fills such a gap of the literature by looking into how the various dimensions measured combine for a state's competitiveness (published annually as the State Competitiveness Index by the Beacon Hill Institute at Suffolk University) affect the firm formation of the state. These dimensions cover government and fiscal policies, security, infrastructure, human resources, technology, business incubation, openness and environmental policy.

Regressing three entrepreneurial activity measures related to new firm formation (entry rate, business density and entry per thousand of active population) individually on the eight dimensions at the state level, it is found that security and technology do not have any significant impact on all of these three entrepreneurial measures. The remaining six dimensions have either significantly positive or negative association with one or more of the three measures.

This paper is organized as follows. Section 2 provides a detailed account of the previous studies related to the importance of new firm formation on economic growth and the determinants of new firm formation. Section 3 presents the formation of the hypotheses related to the impact of state competitiveness on firm formation with respect to the different dimensions measured combine as the competitiveness index of the states. Section 4 describes the data and sample used in this study. Section 5 discusses the findings, followed by the conclusions in Section 6.

2. LITERATURE REVIEW

Early research pointed out that the major role of entrepreneurs in an expanding market is to bring in innovation. And, it is this innovation that helps raise the division of labor and subsequently bring about an increase in productivity (Smith, 1776). Thus, that innovation leading to increases in the division of labor has been well received as the key to economic growth.

Entrepreneurs are those people who bear the capabilities of spotting profit opportunities before all the others can do so and subsequently take actions in response to these opportunities.

However, some people are certainly keener in figuring out particular profit opportunities than the others (Kirzner, 1973). Since each individual possesses his/her own and superior knowledge with respect to his/her own activities – both time wise and location wise, the individual is in a better position to see the profit opportunities hence arisen (Holcombe, 1998). If an economy, usually a decentralized one, lets individuals take advantages of their entrepreneurial insights and rewards them accordingly, it will provide an environment to nurture additional entrepreneurial insights (Hayek, 1945). It is these acts of entrepreneurship that enable the existence of an environment to generate from within countless innovations to constantly raise productivity and achieve economic growth.   Djankov, La Porta, Lopez-de-Silanes, & Shleifer

Entrepreneurship is a critical element in the viability of the modern market economy. The new firms created by the entrepreneurs can help promote competition and economic growth (Klapper, Laeven, & Rajan, 2006; Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2002). At the same time, the growth of this entrepreneurial activity can tighten up the gap in economic growth between advanced and less developed countries (Galor & Michalopoulos, 2009). Brander et al. (1998), using a longitudinal data set on how firm formation evolved in Canada, successfully demonstrated that economic growth is actually driven by new entry instead of by the growth of existing firms.

Both entrepreneurship and new firm formation are also important to regional economic growth. Startup firms represent innovation, particularly related to the new technologies that cannot be easily implemented by existing firms (Audretsch, 1995). Thus, policymakers are recommended to focus on replicating in the under- or un-developed areas those characteristics attributable to the successful locations. These might include leveraging the presence of local research universities, increasing the availability of venture capital, encouraging a risk taking culture and creating strong local informational and business development networks.

Feldman (2001) examined the entrepreneurial event - the decision made by an individual (entrepreneur) to participate in firm formation - as proposed by Shapero (1984) and explored the impact of various regional characteristics on such decision. His findings, based on the development of the US Capitol region, which was a region considered as lacking the necessary attributes for entrepreneurs to become successful but then became a place where certain high technologies were invented (internet) and developed further (biotechnology and telecommunications), suggest that many of the conditions the literature indicates should be in place to promote entrepreneurship [e.g. availability of venture capital (Bruno & Tyebjee, 1982; Florida & Kenney, 1988; Sapienza, 1992), supportive social capital (Abetti, 1992; Bearse, 1981; Flora & Flora, 1993, and Roberts, 1991), entrepreneurial expertise/support services (Bruno & Tyebjee, 1982, and Malecki, 1990) and research universities as growth engines (OTA, 1984 and Raymond, 1996)] appear to lag rather than lead the development of the place – in this case is the US Capitol region.

In addition, entrepreneurs tend to adapt, and when they succeed in what they do, they start acquiring those resources that can support their activities further. Innovation is achieved when new firms are created to turn new ideas into marketable products or services. With the help of the external environments and resources, innovation can be attained more easily although it might not be enough to encourage the formation of new firms in the area. Feldman (2001) suggested that we may consider adding entrepreneurs in the understanding of regional economic systems since these individuals represent the economic agents who make active interactions with the local environments. Moreover, they adjust themselves under new circumstances and upon crises. They take advantage of any opportunity open to them by using the assets which they can

find in the places where they are located. At the end, they establish, run and expand their businesses there.

Using the database created from the World Bank Group Entrepreneurship Survey, Klapper (2006) and Klapper et. al (2007) demonstrated that business entry rate (defined as new firms as a percentage of total registered firms) and business density rate (defined as the number of registered businesses as a percentage of active population (age 15-64) in that year) are significantly associated with a country's economic development and growth (the log of GDP per capita and domestic credit to private sector are both significantly correlated with the business entry rate and business density rate), the quality of the legal and regulatory environment, ease of access to finance, and prevalence of informality. They also find that the business environment (e.g. the ease of starting a business without much political corruption) remains a significant indicator of total firm registration. These results are considered to be consistent with some previous research on the efficient allocation of inputs and other resources to entrepreneurial activities such as (Jovanovic, 1982). Besides, there are also significantly higher entry rates in countries with better governance.

3. HYPOTHESIS FORMATION AND TESTING

In this section, the impact of the various dimensions measured combine as the competitiveness index of a state on new firm formation of the state is examined. The sample for the analyses is a pooled, cross-sectional, longitudinal balanced panel of 150 observations across 50 states with non-missing explanatory and explained variables for 2008 through 2010. Three measures of the entrepreneurial activity related to firm formation are used as the dependent variables. They are notably the business density, entry rates and entry per thousand of active population (Klapper et., 2007). The eight dimensions which are used as the predictors of this entrepreneurial activity are elaborated as below (Beacon Hill Institute, 2008, 2009, and 2010).

Government and fiscal policies

Entrepreneurs are more attracted to places where businesses are taxed moderately and benefited with good financial disciplines. These will lower the cost of doing business and provide relatively more easily accessible sources of investment funding for future expansion. It is expected that the higher the index value a state has on government and fiscal policies, more new firms (and/or establishments) are created (Hypothesis 1).

Security

Entrepreneurs are more likely to set up new firms (or new establishments) in places where the law enforcers can be trusted and the crime rates are low. This will enhance the protection of the company assets and personal safety as well as the properties of both the employees and the entrepreneurs. It is expected that the higher the index value a state has on security, more new firms (and/or establishments) are created (Hypothesis 2).

Infrastructure

Entrepreneurs are more willing to set up firms and/or establishments in places where it is easy for their employees and themselves to commute, communicate via high-speed internet and telephone services. These, together with the prices of housing and energy, will no doubt affect how the business can be operated. Affordable housing prices and reasonable energy costs will lower the cost of

doing business. It is expected that the higher the index value a state has on infrastructure, more new firms (and/or establishments) are created (Hypothesis 3).

Human resources

It would be easier and less expensive for the entrepreneurs to look for the required workers if there is available skilled labor together with a good level of commitment of the local government to education, training and health care. It is expected that the higher the index value a state has on human resources, more new firms (and/or establishments) are created (Hypothesis 4).

Technology

Technology often does not only help entrepreneurs solve business problems but also help them save time and cost over the long run. Therefore, its development and application have been essential to economic development and growth since the industrial revolution. It is expected that the higher the index value a state has on technology, more new firms (and/or establishments) are created (Hypothesis 5).

Business Incubation

A business cannot grow without, either the internal or from the financial system, mobility of financing for further investment. When setting up new firms or new establishments, entrepreneurs will definitely not want to face such a confinement in the future. It is expected that the higher the index value a state has on business incubation, more new firms (and/or establishments) are created (Hypothesis 6).

Openness

If an economy is an open one, people living and businesses operating in it will benefit from the interactions between the domestic community and outside. People and businesses of the domestic community can trade with those in the outside communities. Such activities will also encourage the funds for investment flow across the border. As a result, open economies are likely more competitive than their close counterparts. They are also more productive due to their more thorough specialization in the area where they can derive competitive advantage(s). Entrepreneurs are more likely to set up their firms in an open economy as compared with a close one. It is expected that the higher the index value a state has on openness, more new firms (and/or establishments) are created (Hypothesis 7).

Environmental Policy

States that are facing bad environmental problems and thus have a harsh policy of environmental regulation in place will likely add costs to the operations of most businesses. It is also more difficult for businesses to recruit and retain the required workers and managers. Therefore, these states are less attractive to entrepreneurs in setting up new firms or establishments. It is expected that the higher the index value a state has on environmental policy, more new firms (and/or establishments) are created (Hypothesis 8).

The above hypotheses are tested with the following model.

$$\text{EntActivityMeasure}_{i,t} = \alpha_P + \beta_1 \text{GFP}_{i,t} + \beta_2 \text{Security}_{i,t} + \beta_3 \text{Infrstrc}_{i,t} + \beta_4 \text{Humres}_{i,t} + \beta_5 \text{Tech}_{i,t} + \beta_6 \text{Bizinc}_{i,t} + \beta_7 \text{Openness}_{i,t} + \beta_8 \text{Envmpoli}_{i,t} + \beta_{cs}\text{Control Variable(s)}_{i,t} + v_{i,t}$$

where $EntActivityMeasure_{i,t}$ are the three entrepreneurial activity measures, in turn, including
$EntryRate_{i,t}$ (Entry Rate), $BusDensity_{i,t}$ (Business Density) and $Entryactpop_{i,t}$ (Entry Per Thousand of Active Population) for state i in year t

$GFP_{i,t}$ is the BHI's sub-index value for government and physical policies in their State Competitiveness Index for state i in year t.

$Security_{i,t}$ is the BHI's sub-index value for security in their State Competitiveness Index for state i in year t.

$Infrstrc_{i,t}$ is the BHI's sub-index value for existing infrastructure in their State Competitiveness Index for state i in year t.

$Humres_{i,t}$ is the BHI's sub-index value for human resources availability in their State Competitiveness Index for state i in year t.

$Tech_{i,t}$ is the BHI's sub-index value for technology availability in their State Competitiveness Index for state i in year t.

$Bizinc_{i,t}$ is the BHI's sub-index value for business incubation in their State Competitiveness Index for state i in year t.

$Openness_{i,t}$ is the BHI's sub-index value for openness in their State Competitiveness Index for state i in year t.

$Envmpoli_{i,t}$ is the BHI's sub-index value for environmental policies in their State Competitiveness Index for state i in year t.

Control Variable(s)$_{i,t}$ include the GDP and/or the active population for state i in year t wherever applicable.

Two different estimation methods are used in this study. They are the random-effect general least square (GLS) and the population-averaged Generalized Estimating Equation (GEE).

4. DATA AND SAMPLE DESCRIPTION

In this paper, the data used were obtained from the following sources. Firm formation data (for variables such as Firms, Establishments, Employees, Denomination, Job Creation etc.) were downloaded from Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/). State population for 2008, 2009 and 2010 were extracted from the US Census Bureau, Statistical Abstract of the United States: 2010, 2011 and 2012 respectively. State GDP for 2008 through 2010 were downloaded from the US Bureau of Economic Analysis (BEA) (http://www.bea.gov/). The values of the State Competitiveness Index (and their sub-indexes) for 2008, 2009 and 2010 were extracted from the Beacon Hill Institute (BHI)'s State Competitiveness Report 2008, 2009 and 2010 respectively. The reasons for choosing these three years for the analyses of this study are i) at the time of writing this paper, data on firm formation are available up to only 2010 and ii) there are various revisions on the component indicators included in the sub-indexes in the State Competitiveness Index in the past years except 2008 through 2010. To be more comparable, the study has been conducted on the data obtained for these three years only.

4.1 State Competitiveness

According to the BHI at Suffolk University, a state can be considered as competitive only if it has in place all the necessary policies and conditions that allow a high level of per capita income to be earned and grown continuously. As such, the state must be able to draw in and retain new businesses. At the same time, it needs also to help existing firms grow by providing an environment that they can conduct their businesses well. Based on this definition of competitiveness and the simple economic relation Y = f(K, L, technology) which implies that the output (Y) of an economy depends on the amount of capital (K), labor (L) and technology put into the production process (Solow, 1956). BHI has constructed the State Competitiveness Index since 2001. This composite index consists of eight groups of indicators for the dimensions related to government and fiscal policies, security, infrastructure, human resources, technology, business incubation, openness and environmental policy. According to Michael Porter, competitiveness lays the microeconomic foundation of prosperity of a place, be it a country, a state or a city. All the states of the United States face the same macroeconomic conditions such as national fiscal, monetary and trade policy. At the same time, each state may have its own unique microeconomic policies, including but are not limited to those related to tax and regulatory regimes, provision and emphasis on education as well as attractiveness to business. It is these microeconomic policies that help firms further in the creation of valuable goods and services employing their own productive methods and in turn build the wealth of the states.

As shown in Table 1 (Appendix), Massachusetts, and North Dakota were among the top five most competitive states whereas Alabama, Mississippi, and West Virginia were among the bottom five least competitive states over the sample period from 2008 through 2010. Colorado, Idaho, Minnesota, Utah, and Wyoming appeared in the top five-performer list at least once during these three years. On the other hand, Georgia, Louisiana, New Mexico, Ohio, South Carolina, and Tennessee each appeared once in the bottom five-performer list over the same period of time. It can also be seen that the majority of the most competitive states are clustered in the Rocky Mountain region while the least competitive states are found mainly in the Southeast region as identified by the Bureau of Economic Analysis (BEA).

4.2 Economic Conditions of the States

Table 2 (Appendix) shows that the fifty states generated in total over $12,000,000 billion real GDP in each of the three years. The aggregate real GDP generated in 2009 ($12,438,029 billion) was down by 4%, compared with the previous year ($12,928,521 billion). The 2010 real GDP returned to about 99% of the 2008 level. California, Florida, Illinois, Texas, and New York constantly generated the highest real GDPs among the other states. On the other hand, Montana, North Dakota, South Dakota, Vermont, and Wyoming generated the lowest real GDPs from 2008 through 2010. The real GDP ranges from $21,963 billion (Vermont, 2009) to $1,756,115 billion (California, 2008). Surprisingly, Table 2 seems to suggest that neither the most competitive states generated the highest GDPs nor the least competitive states generated the lowest GDPs.

4.3 Population Size

As can be seen from Table 3 (Appendix), there is no significant change in the overall population from 2008 through 2010. The total active population (age from 15 through 64) of the

fifty states combine is about 245 million people in the sample period, resembles approximately 80 percent of the total population. The most populous states are California, Texas, New York, Florida, and Illinois (the same as those states which generated the highest GDPs). The least populous states include Alaska, North Dakota, South Dakota, Vermont, and Wyoming (the same as those that generated the lowest GDPs except Alaska). The smallest active population size is found in Wyoming (about 429,000 people, 2008) while the largest in California (about 30,492,000 people, 2010).

4.4 Firm formation

From Table 4 (Appendix), it can be seen that a total of 491,500 firms (495,593 establishments) were created in the fifty states in 2008, compared to 410,578 firms (413,528 establishments) in 2009 and 394,698 firms (400,175 establishments) in 2010. These firms employed 2,730,056 people (with a DHS denominator of 1,366,084), 2,393,720 people (with a DHS denominator of 1,196,937) and 2,302,373 people (with a DHS denominator of 1,151,258) in 2008, 2009 and 2010 respectively. They also created 2,689,295 jobs (of which 2,255,733 are of new job types) in 2008, 2,361,056 jobs (of which 2,251,018 are of new job types) in 2009 and 2,302,373 jobs (of which 2,141,932 are of new job types) in 2010. All the above variables show a declining trend in the aggregate level for all the fifty states.

Tables 5 and 6 (Appendix) show that California, Florida, Illinois , New York, and Texas have the highest number of firms (and establishments) created whereas Alaska, Delaware, North Dakota, Rhode Island, Vermont, and Wyoming have the lowest number of firms (and establishments) created from 2008 through 2010.

Similarly, as shown in Tables 7 and 8 (Appendix), the new firms created in California, Florida, New York, Texas, and Illinois hired the highest number of workers whereas the new firms created in Alaska, Delaware, North Dakota, Rhode Island, South Dakota, Vermont, and Wyoming hired the lowest number of workers in the sample years. The same pattern can be seen in job creation (Table 9, Appendix) and job creation birth (Table 10, Appendix).

Table 11 (Appendix) shows that the entry rate, business density and entry per thousand of active population all have a downward trend over the sample period. On average, there were relatively fewer firms operated by the active population in 2010 than in 2008 and 2009. In 2008, there were on average across the states 26.37 firms operated by each thousand of active individuals. It was down to 24.48 firms for the same number of active individuals in 2010. At the same time, fewer firms were created by the active population comparing 2010 to 2008, on average 2.07 firms were created by per thousand active population in 2008. And, it was down to 1.59 firms created by the same number of active individuals in 2010.

From Table 12 (Appendix), it can be seen that Arizona, Colorado, Florida, Nevada, New York, Texas and Utah have the highest entry-rate while Iowa, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia and Wisconsin have the lowest. Table 13 (Appendix) illustrates that Montana, North Dakota, South Dakota, Vermont and Wyoming have the highest business density whereas Arizona, Kentucky, Mississippi, Tennessee and Texas have the lowest business density. As for the entry per thousand of active population, Table 14 (Appendix) shows a slightly different pattern. Colorado, Florida, Idaho, Montana, South Dakota, New York, and Wyoming have the highest entry of firms per thousand of active population while Alabama, Indiana, Kentucky, Michigan, Mississippi, Ohio and West Virginia have the lowest.

5. DISCUSSION OF RESULTS

Table 15 (Appendix) illustrates the regression results of the random-effect GLS and the population-averaged GEE based on the pooled, cross-sectional, longitudinal balanced panel of 150 observations across 50 states with non-missing explanatory and explained variables for 2008 through 2010. The results indicate that all the eight dimensions, except security and technology, significantly affect firm entry rate (defined as new firms as a percentage of total registered firms) after adjusting for the economic condition and population size of the state-year. However, surprisingly the human resources dimension has a negative impact on firm entry rate. This could be due to human resources is a mobile determinant of a state's competitiveness among others. The relatively high level of commitment of the local government to education results in a larger pool of skilled labor. This, in turn, opens up more job opportunities to the residents in- or out-of-state. Consequently, it reduces their desires or needs to go entrepreneurial when they become unemployed in their home states.

On the other hand, only human resources and environmental policy have significantly positive impact on business density (defined as the number of registered businesses per thousand of active population (age 15-64) in that year) after adjusting for the economic condition of the state-year. As for entry per thousand of active population (defined as new firms per thousand of active population), it receives significantly positive impact from infrastructure, human resources, business incubation, openness and environmental policy.

A further look at Table 15 shows that both security and technology do not have any significant impact on all these three entrepreneurial measures (both Hypothesis 2 and Hypothesis 5 cannot be accepted). In other words, when making their decisions on whether to establish a new firm or new establishment, the entrepreneurs do not seem to care much about the law enforcement and crime rate as well as the existing technology development of the state overall. It might be because the statewide security condition does not vary much across states. Thus, it is not a major consideration for the business owners in choosing the locations of their firms. Like Human Resources, technology is portable. As long as the business owners can secure enough funding, they can easily build the same technology anywhere. Thus, technology is also not a major determinant in their choice of firm location.

6. CONCLUSION

Successful entrepreneurs are keen to spot profit opportunities. They then take actions in response to these opportunities by creating new firms in where the opportunities can offer the most to them or work the best for them. It is these individuals who bring about innovations into the production of goods and services that helps improve the quality of life of others in addition to the creation of job opportunities and maintenance of the viability of the economies. This paper examines the dimensions contributed to the competitiveness of a state and how significant each of them is in new firm formation of the state. Regressing the three entrepreneurial activity measures related to new firm formation (entry rate, business density and entry per thousand of active population) individually on the eight dimensions covered in the BHI's Competitive Index (including government and fiscal policies, security, infrastructure, human resources, technology, business incubation, openness and environment policy) at the state level, it is found that security and technology do not have any significant impact on all these three entrepreneurial activity

measures. The remaining six dimensions have either significantly positive or negative association with one or more of the three measures.

REFERENCES

Abetti, P. (1992). Planning and building the infrastructure for technological entrepreneurship. *International Journal of Technology Management, 7*, 129-139.

Audretsch, D. (1995). *Innovation and Industrial Evolution.* MIT Press: Boston, M.A.

Bearse, P. (1981). *A Study of Entrepreneurship by Region and SMSA Size.* Public/Private Venture, Philadelphia.

Beacon Hill Institute (2008). *The State Competitiveness Report 2008*. Suffolk University. Retrieved from http://www.beaconhill.org/CompetitivenessHomePage.html

_____ (2009). *The State Competitiveness Report 2009.* Suffolk University. Retrieved from http://www.beaconhill.org/CompetitivenessHomePage.html

_____ (2010). *The State Competitiveness Report 2010*. Suffolk University. Retrieved from http://www.beaconhill.org/CompetitivenessHomePage.html

Brander, J., Hendricks, K., Amit, R., & Whistler, D. (1998). The engine of growth hypothesis: On the relationship between firm size and employment growth work. *The University of British Columbia working paper.*

Bruno, A., & Tyebjee, T. (1982). The Environment for Entrepreneurship. In C. Kent, D. Sexton, and H. Vesper (eds), *Encolpedea of Entrepreneurship* (pp. 288-307). Prentice Hall: Englewood Cliffs, NJ.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). The regulation of entry. *Quarterly Journal of Economics, 117*, 1-35.

Feldman, M. (2001). The entrepreneurial event revisited: Firm formation in a regional context. *Industrial and Corporate Change, 10(4)*, 861-891.

Flora, C., & Flora, J. (1993). Entrepreneurship social infrastructure: A necessary ingredient. *Annals of the American Academy of Political and Social Science, 529*, 48-58.

Florida, R., & Kenney, M. (1988). Venture capital-financed innovation and technological change in the USA. *Research Policy, 17*, 119-137.

Galor O., & Michalopoulos, S. (2009). The evolution of entrepreneurial spirit and the process of development. *Collegio Carlo Alberto Notebooks Working Paper No.111.*

Hayek, F. (1945). The use of knowledge in society. *American Economic Review, 35*, 519-530.

Holcombe, R. (1998). Enterpreneurship and economic growth. *The Quarterly Journal of Austrian Economics 1(2),* 45-62.

Jovanovic, B. (1982). Selection and the evolution of industry. *Econometrica*, *50*, 649-670.

Kirzner, I. (1973). *Competition and Entrepreneurship*. Chicago: University of Chicago Press

Klapper, L. (2006). Entrepreneurship – How much does the business environment matter? *Viewpoint*. The World Bank Group, Retrieved from http://rru.worldbank.org/PublicPolicyJournal

Klapper, L., Amit, R., Guillen, M., & Quesada, J. (2007). Entrepreneurship and firm formation across countries. *World Bank Policy Research Working Paper No.4313.*

Klapper, L., Laeven, L., & Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. *Journal of Financial Economics, 82(3)*, 591-629.

Malecki, E. (1990). New firm formation in the USA: Corporate structure, venture capital, and local environment. *Entrepreneurship and Regional Development, 2*, 247-265.

OTA (Office of Technology and Assessment) (1984), *Technology, Innovation, and regional Economic Development.* US Government Printing Office: Washington, DC.

Raymond, S. (ed.). (1996). The technology link to economic development. *Annals of the New York Academy of Science*, 787.

Roberts, E. (1991). *Entrepreneurs in High Technology*. Oxford University Press: New York.

Sapienza, H. (1992). When do venture capitalists add value? *Journal of Business Venturing, 7*, 9-27.

Shapero, A. (1984). The entrepreneurial event. In C. Kent (ed.), *The Environment for Entrepreneurship* (pp. 21-40). Lexington Books: Lexington, MA,

Smith, A. (1776) 1937. *An inquiry into the nature and causes of the wealth of nations.* New York: Modern Library.

Solow, R. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics, 70(1)*, 65-94.

APPENDIX

Table 1: The five most and five least competitive states in US from 2008 through 2010.

	Ranking	2008	2009	2010
Top 5 Performers	1	Massachusetts	Massachusetts	North Dakota
	2	Utah	North Dakota	Colorado
	3	North Dakota	Utah	Massachusetts
	4	Colorado	Minnesota	Wyoming
	5	Idaho	Wyoming	Minnesota
Bottom 5 Performers	46	South Carolina	Tennessee	Georgia
	47	West Virginia	Ohio	New Mexico
	48	Alabama	West Virginia	Alabama
	49	Louisiana	Mississippi	West Virginia
	50	Mississippi	Alabama	Mississippi
BEA Regions	States			
New England	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont			
Mideast	Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania			
Great Lakes	Illinois, Indiana, Michigan, Ohio, Wisconsin			
Plains	Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota			
Southeast	Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia			
Southwest	Arizona, New Mexico, Oklahoma, Texas			
Rocky Mountain	Colorado, Idaho, Montana, Utah, Wyoming			
Far West	Alaska, California, Hawaii, Nevada, Oregon, Washington			

Sources: This table is constructed using the overall competitiveness ranking of the states published by the Beacon Hill Institute at Suffolk University from 2008 through 2010 and the classification of regions by the U.S. Bureau of Economic Analysis (http://www.bea.gov/).

Table 2: Real GDP generated by the fifty states in the US from 2008 through 2010 ($' Billion).

		Real GDP of the Fifty States					
		2008		2009		2010	
Sum		$12,928,521		$12,438,029		$12,827,864	
Avg.		258,570		248,761		256,557	
Std. Dev.		313,040		300,626		309,074	
Min.		22,772		21,963		22,857	
Max.		1,756,115		1,673,333		1,701,912	
	State	Real GDP of 2008	State	Real GDP of 2009	State	Real GDP of 2010	
Top 5 performers	California	$1,756,115	California	$1,673,333	California	$1,701,912	
	Texas	1,077,144	Texas	1,057,675	Texas	1,113,104	
	New York	987,442	New York	963,681	New York	1,005,324	
	Florida	689,445	Florida	651,982	Florida	657,717	
	Illinois	580,712	Illinois	557,579	Illinois	574,416	
Bottom 5 performers	South Dakota	$34,302	South Dakota	$34,097	South Dakota	$34,175	
	Montana	31,946	Wyoming	32,088	Montana	31,985	
	Wyoming	31,369	Montana	31,067	Wyoming	31,919	
	North Dakota	28,624	North Dakota	29,209	North Dakota	31,833	
	Vermont	22,772	Vermont	21,963	Vermont	22,857	

Source: This table is constructed using state real GDP for 2008 through 2010 that were downloaded from the U.S. Bureau of Economic Analysis (http://www.bea.gov/).

Table 3: Population distribution across the states (in thousands) from 2008 through 2010

	Of the Fifty States								
	2008			2009			2010		
	Population Age 15 - 64	Total Population	Percent	Population Age 15 - 64	Total Population	Percent	Population Age 15 - 64	Total Population	Percent
Sum	243,700	303,472	80.03	245,633	306,395	80.17	247,791	308,160	80.41
Avg.	4,874	6,070	80.14	4,913	6,128	79.98	4,956	6,163	80.14
Std. Dev.	5,453	6,749	1.34	5,491	6,805	1.26	5,558	6,850	1.27
Min	429	532	76.39	428	536	76.47	454	565	76.95
Max	29,938	36,757	85.13	30,060	36,962	84.67	30,492	37,269	84.67

	2008				2009				2010		
State Name	Population Age 15 - 64	Total Population	Percent	State Name	Population Age 15 - 64	Total Population	Percent	State Name	Population Age 15 - 64	Total Population	Percent
Top 5 performers											
California	29,938	36,757	0.81	California	30,060	36,962	0.81	California	30,492	37,269	0.82
Texas	19,826	24,325	0.82	Texas	20,169	24,782	0.81	Texas	20,615	25,144	0.82
New York	15,674	19,490	0.80	New York	15,699	19,542	0.80	New York	15,604	19,378	0.81
Florida	14,000	18,328	0.76	Florida	14,176	18,538	0.76	Florida	14,468	18,802	0.77
Illinois	10,432	12,901	0.81	Illinois	10,422	12,911	0.81	Illinois	10,386	12,832	0.81
Bottom 5 performers											
South Dakota	630	806	0.78	South Dakota	636	814	0.78	South Dakota	637	814	0.78
Alaska	584	686	0.85	Alaska	591	698	0.85	Alaska	602	711	0.85
North Dakota	505	642	0.79	North Dakota	510	647	0.79	North Dakota	530	673	0.79
Vermont	503	622	0.81	Vermont	499	620	0.80	Vermont	503	627	0.80
Wyoming	429	532	0.81	Wyoming	428	536	0.80	Wyoming	454	565	0.80

Source: State population for 2008, 2009 and 2010 were extracted from U.S. Census Bureau, Statistical Abstract of the United States: 2010, 2011 and 2012 respectively.

Table 4: Total firm formation of the fifty states from 2008 through 2010.

		Firms	Estab-ment	Employ-ment	DHS Denomin-ator	Job Creation	Job Creation Birth
2008	Sum	491,500	495,593	2,730,056	1,366,084	2,689,295	2,255,733
	Avg.	9,830	9,912	54,601	27,322	53,786	45,115
	Std. Dev.	11,739	11,826	67,376	33,681	66,321	63,443
	Min	1,163	1,166	4,729	2,365	4,514	4,514
	Max	63,481	63,963	364,424	182,216	359,143	359,143
2,009	Sum	410,578	413,528	2,393,720	1,196,937	2,361,056	2,251,018
	Avg.	8,212	8,271	47,874	23,939	47,221	45,020
	Std. Dev.	10,088	10,149	62,083	31,042	61,308	61,434
	Min	944	947	3,769	1,885	3,731	1,869
	Max	53,752	54,108	342,082	171,043	337,840	337,840
2010	Sum	394,698	400,175	2,302,373	1,151,258	2,302,373	2,141,932
	Avg.	7,894	8,004	46,047	23,025	46,047	42,839
	Std. Dev.	9,789	9,919	56,373	28,187	56,373	47,937
	Min	874	874	4,257	2,130	4,257	3,653
	Max	50,184	50,833	284,157	142,081	284,157	222,580

Source: This table is constructed with data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/).

Table 5: Firm formation by states from 2008 through 2010

	Firm Formation					
	2008		2009		2010	
	State	Number of New Firms	State	Number of New Firms	State	Number of New Firms
Top 5 performers	California	63,481	California	53,752	California	50,184
	Florida	40,560	Florida	34,050	New York	34,446
	New York	37,222	New York	33,803	Florida	34,391
	Texas	36,532	Texas	32,077	Texas	31,178
	Illinois	19,171	Illinois	16,290	Illinois	15,631
Bottom 5 performers	Wyoming	1,489	Delaware	1,254	Delaware	1,195
	Delaware	1,486	Rhode Island	1,249	North Dakota	1,104
	North Dakota	1,289	North Dakota	1,170	Wyoming	1,072
	Alaska	1,247	Alaska	1,063	Alaska	997
	Vermont	1,163	Vermont	944	Vermont	874

Source: This table is constructed with data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/).

Table 6: Establishment formation by new firms by states from 2008 through 2010

	Establishment Formation					
	2008		2009		2010	
	State	Number of Establish-ments	State	Number of Establish-ments	State	Number of Establish-ments
Top 5 performers	California	63,963	California	54,108	California	50,833
	Florida	40,817	Florida	34,234	New York	34,836
	New York	37,427	New York	33,895	Florida	34,759
	Texas	36,922	Texas	32,376	Texas	31,789
	Illinois	19,327	Illinois	16,391	Illinois	15,869
Bottom 5 performers	Delaware	1,499	Delaware	1,265	Delaware	1,201
	Wyoming	1,497	Rhode Island	1,258	North Dakota	1,116
	North Dakota	1,300	North Dakota	1,178	Wyoming	1,072
	Alaska	1,271	Alaska	1,084	Alaska	1,011
	Vermont	1,166	Vermont	947	Vermont	874

Source: This table is constructed with data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/).

Table 7 Employees hired by the new firms across states from 2008 through 2010

	Employees Hired by New Firms as of March 12					
	2008		2009		2010	
	State	Number of Employees	State	Number of Employees	State	Number of Employees
Top 5 performers	California	364,424	California	342,082	California	284,157
	Texas	237,034	Texas	231,096	Texas	222,580
	Florida	205,965	Florida	176,291	Florida	182,671
	New York	203,700	New York	174,024	New York	170,826
	Illinois	107,449	Illinois	86,245	IL Illinois	93,595
Bottom 5 performers	South Dakota	7,282	Rhode Island	6,624	Delaware	5,840
	North Dakota	6,847	North Dakota	6,184	Wyoming	4,754
	Wyoming	6,154	Wyoming	5,315	North Dakota	4,727
	Alaska	5,526	Alaska	4,225	Alaska	4,290
	Vermont	4,729	Vermont	3,769	Vermont	4,257

Source: This table is constructed with data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/).

Table 8. Davis-Haltiwanger-Schuh (DHS) denominator across states from 2008 through 2010

	Davis-Haltiwanger-Schuh (DHS) Denominator					
	2008		2009		2010	
	State	DHS Denominator	State	DHS Denominator	State	DHS Denominator
Top 5 performers	California	182,216	California	171,043	California	142,081
	Texas	118,519	Texas	115,550	Texas	111,292
	Florida	102,985	Florida	88,147	Florida	91,336
	New York	101,853	New York	87,015	New York	85,414
	Illinois	53,727	Illinois	43,124	Illinois	46,801
Bottom 5 performers	South Dakota	3,642	Rhode Island	3,313	Delaware	2,921
	North Dakota	3,425	North Dakota	3,094	Wyoming	2,378
	Wyoming	3,078	Wyoming	2,659	North Dakota	2,364
	Alaska	2,765	Alaska	2,113	Alaska	2,146
	Vermont	2,365	Vermont	1,885	Vermont	2,130

Source: This table is constructed with data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/). For time t, DHS denominator is the average of employment for times t and t-1.

Table 9 Job creation across states from 2008 through 2010

	Job Creation					
	2008		2009		2010	
	State	Number of Job Created	State	Number of Job Created	State	Number of Job Created
Top 5 performers	California	359,143	California	337,840	California	284,157
	Texas	233,338	Texas	228,708	Texas	222,580
	Florida	201,802	Florida	173,847	Florida	182,671
	New York	200,486	New York	171,088	New York	170,826
	Illinois	105,913	Illinois	85,145	Illinois	93,595
Bottom 5 performers	South Dakota	7,155	Rhode Island	6,552	Delaware	5,840
	North Dakota	6,757	North Dakota	6,096	Wyoming	4,754
	Wyoming	6,038	Wyoming	5,267	North Dakota	4,727
	Alaska	5,415	Alaska	4,157	Alaska	4,290
	Vermont	4,514	Vermont	3,731	Vermont	4,257

Source: This table is constructed with data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/).

Table 10 Job created by establishment born across states from 2008 through 2010

	2008		2009		2010	
	State	Job created by establishment born	State	Job created by establishment born	State	Job created by establishment born
Top 5 performers	California	359,143	California	337,840	Texas	222,580
	Florida	201,802	Texas	228,708	Florida	182,671
	New York	200,486	Florida	177,067	California	177,072
	Texas	166,201	New York	171,088	New York	157,782
	Illinois	105,913	Georgia	78,213	Illinois	93,595
Bottom 5 performers	North Dakota	6,757	Delaware	3,938	Wyoming	4,754
	Wyoming	6,038	South Dakota	3,708	North Dakota	4,727
	Alaska	5,415	Montana	3,655	Alaska	4,290
	Montana	4,907	Alaska	1,986	Vermont	4,257
	Vermont	4,514	Vermont	1,869	Rhode Island	3,653

Source: This table is constructed with data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/).

Table 11. Selected statistics for entry-rate, firm-density and entry per thousand of active population

		Entry-Rate	Firm-Density	Entry Per Thousand of Active Population
2008	Avg.	0.08	26.37	2.07
	Std. Dev.	0.01	5.02	0.49
	Min	0.06	19.65	1.31
	Max	0.11	40.72	3.47
2009	Avg.	0.07	25.63	1.70
	Std. Dev.	0.01	4.99	0.40
	Min	0.05	19.22	1.08
	Max	0.09	40.41	2.93
2010	Avg.	0.07	24.48	1.59
	Std. Dev.	0.01	4.69	0.36
	Min	0.05	18.57	0.95
	Max	0.09	37.20	2.39

Source: The statistics are calculated from the firm formation related data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/) and the population data from U.S. Census Bureau, Statistical Abstract of the United States: 2010, 2011 and 2012.

Table 12. Firm entry rate across states from 2008 through 2010
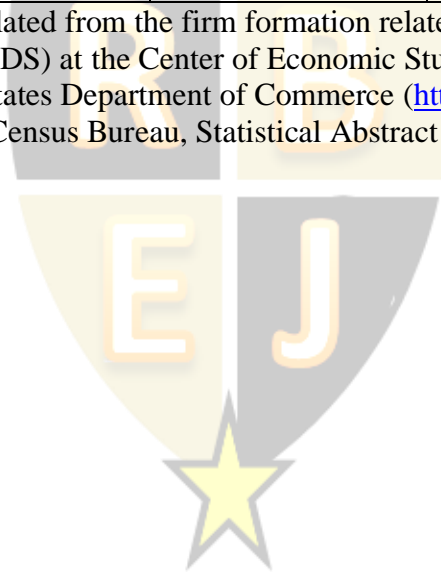
	2008		2009		2010	
	State	Entry-Rate	State	Entry-Rate	State	Entry-Rate
Top 5 performers	Nevada	.1126974	Nevada	.0938608	Nevada	.0946331
	Utah	.1106813	Florida	.0870608	Florida	.0919297
	Arizona	.1018867	Utah	.0859598	Utah	.0879369
	Florida	.0996156	Texas	.0827482	New York	.0821992
	Colorado	.0959844	Arizona	.0806525	Texas	.0814543
Bottom 5 performers	Pennsylvania	.0665956	Wisconsin	.0554136	Iowa	.053956
	Wisconsin	.0644125	Ohio	.0534162	Wisconsin	.0532898
	Vermont	.0630934	Vermont	.0525759	Ohio	.0529728
	Ohio	.0630313	Rhode Island	.0519313	Vermont	.0505816
	West Virginia	.0606237	West Virginia	.0516366	West Virginia	.0476503

Source: This table is constructed with the firm formation related data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/) and the population data from U.S. Census Bureau, Statistical Abstract of the United States: 2010, 2011 and 2012.

Table 13. Business density across states from 2008 through 2010

	2008		2009		2010	
	State	Business Density	State	Business Density	State	Business Density
Top 5 performers	Wyoming	40.72261	Wyoming	40.41122	Wyoming	37.20044
	Montana	40.40495	Montana	39.40649	Montana	37.17798
	North Dakota	36.73069	North Dakota	36.07255	North Dakota	34.44717
	Vermont	36.64612	Vermont	35.98196	Vermont	34.35189
	South Dakota	35.03651	South Dakota	34.43711	South Dakota	33.76295
Bottom 5 performers	Arizona	20.76235	Kentucky	20.03706	Kentucky	19.43432
	Kentucky	20.73991	Tennessee	19.85888	Arizona	19.18065
	Tennessee	20.56245	Arizona	19.7749	Tennessee	18.99331
	Mississippi	20.2451	Mississippi	19.76063	Mississippi	18.98148
	Texas	19.6493	Texas	19.21989	Texas	18.5674

Source: This table is constructed with the firm formation related data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/) and the population data from U.S. Census Bureau, Statistical Abstract of the United States: 2010, 2011 and 2012.

Table 14. Entry per thousand of active population across states from 2008 through 2010

	2008		2009		2010	
	State	Entry per Thousand of Active Population	State	Entry per Thousand of Active Population	State	Entry per Thousand of Active Population
Top 5 performers	Wyoming	3.470862	Wyoming	2.932243	Montana	2.385403
	Montana	3.397135	Montana	2.653247	Florida	2.377039
	Idaho	2.931148	Florida	2.401947	Wyoming	2.361233
	Florida	2.897143	Colorado	2.320087	Colorado	2.232350
	Colorado	2.896560	South Dakota	2.309748	New York	2.207511
Bottom 5 performers	Michigan	1.530782	Mississippi	1.267857	Mississippi	1.176768
	Mississippi	1.525575	Indiana	1.254030	Indiana	1.172394
	Kentucky	1.450263	Kentucky	1.218008	Alabama	1.158984
	Ohio	1.349215	Ohio	1.105252	Ohio	1.056667
	West Virginia	1.312281	West Virginia	1.084912	West Virginia	.9517574

Source: This table is constructed with the firm formation related data obtained from the Business Dynamic Statistics (BDS) at the Center of Economic Studies under the United States Census Bureau of the United States Department of Commerce (http://www.census.gov/ces/) and the population data from U.S. Census Bureau, Statistical Abstract of the United States: 2010, 2011 and 2012.

Table 15. Regressions Predicting Entry Rate, Business Density and Entry Per Thousand of Active Population.

	(1)	(2)	(3)	(4)	(5)	(6)
	Entry Rate [GLS]	Entry Rate [GEE]	Business Density [GLS]	Business Density [GEE]	Entry Per Thousand of Active Population [GLS]	Entry Per Thousand of Active Population [GEE]
Government and fiscal policies [GFP$_{i,t}$]	.003 [2.06]**	.004 [2.51]**	-.205 [-0.68]	-.179 [-0.63]	-.013 [-0.22]	-.012 [-0.21]
Security [Security$_{i,t}$]	.001 [0.66]	.001 [0.74]	-.080 [-0.28]	-.071 [-0.27]	.044 [0.76]	.0466 [0.82]
Infrastructure [Infrstrc$_{i,t}$]	.003 [2.15]**	.003 [2.08]**	.246 [0.90]	.243 [0.94]	.133 [2.38]**	.133 [2.47]**
Human resources[Humres$_{i,t}$]	-.005 [-2.32]**	-.005 [-2.54]***	1.738 [3.20]***	1.597 [3.06]***	.1237 [1.61]*	.123 [1.73]***
Technology [Tech$_{i,t}$]	-.001 [-0.61]	-.001 [-0.71]	-.213 [-0.39]	-.169 [-0.32]	-.094 [-1.41]	-.096 [-1.57]
Business Incubation [Bizinc$_{i,t}$]	.005 [3.42]***	.006 [4.17]***	.376 [1.22]	.338 [1.15]	.241 [4.48]***	.255 [5.03]***
Openness [Openness$_{i,t}$]	.005 [2.31]**	.005 [2.93]**	.115 [0.13]	.123 [0.14]	.155 [1.98]**	.156 [2.19]**
Environmental Policy [Envmpoli$_{i,t}$]	.002 [1.63]*	.003 [2.12]**	1.68 [3.33]***	1.576 [3.17]***	.223 [4.07]***	.228 [4.55]***
Real GDP	7.26e-08 [2.35]**	5.93e-08 [2.17]**	-2.64e-06 [-1.46]	-2.73e-06 [-1.49]	1.90e-07 [1.19]	1.90e-07 [1.31]
Active Population	-3.40e-06 [-2.01]**	-2.66e-06 [-1.78]*				
Constant	-.003 [-0.16]	-.012 [-0.66]	7.871 [1.31]	8.905 [1.51]	-2.316 [-3.28]***	-2.419 [-3.69]***
Overall R-squared	0.4572		0.5521		0.4668	
Wald Chi-square	66.94***	92.72***	39.92***	36.55***	64.02***	78.74***

Note: z-scores are shown in brackets beneath regression coefficient. Asterisks *, ** and *** indicate significance at 10%, 5% and 1% respectively.