Business Environment and New Firm Creation:
An International Comparison

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Abstract: The health of the entrepreneurial sector is becoming even more important to governments as the baby-boom generation begins to retire in many industrialized countries. This empirical study investigates the effect that various aspects of a nation's business environment has on new firm creation rates. In a cross-section sample of 64 nations in 2003 we find economic freedom, property rights and corruption to be the most important business environment measures in explaining cross-country differences in the number of new firm start-ups. For governments preparing to deal with the adverse economic effects of the coming demographic change, the results of this study point out the type of policies that are associated with higher level of entrepreneurial activity.

1. Introduction

Entrepreneurs are a key component of successful economies. True, the overwhelming majority of businesses are small in size and due to their small size may operate at an inefficient economic scale, but entrepreneurs make up for this disadvantage by sparking competition, experimenting with new ideas, and relentlessly venturing into markets previously uncharted.[1] By finding new ways to transform existing resources into outputs that create extra value above the resource cost to consumers, entrepreneurs serve a critical function in economic development. From society's welfare point of view, it is critical to try to understand the factors explaining the presence or lack of entrepreneurship in a country. In this study we will consider several measures of business environment and will try to identify the statistical connection between the type of business environment and the new firm creation rate in a country.

Historically cross-country data concerning entrepreneurship has not been widely available or comparable across nations when it is available. New datasets prepared by the International Finance Corporation (IFC) and the World Bank Group have opened up research possibilities in this field of study, providing a basis for large-scale cross-country comparisons. This paper uses the latest of this entrepreneurship data to explore international differences in new firm creation rates due to business environment.

The paper begins with a section discussing the entrepreneur's role in the economy. Next, the findings of previous research related to new firm creation are summarised. In the next section the methodology and data used in this paper to study new firm creation is presented. Then, the results of estimated regression equations are discussed and a section

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[1] For example, according to the Statistical Abstract of the United States, 2004-2005, almost 74% of firms in the U.S. are organized as sole proprietorships, typically the organization form of the smallest of businesses.

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considering some policy implications for nations wishing to motivate nascent

entrepreneurs follows. The paper concludes with a short summary of the major findings.

2. Role of the Entrepreneur

The entrepreneur is at the center of Smith's theory of the invisible hand. According to

Smith (1910) [1776], following his self-interest, the entrepreneur also, at times

inadvertently, contributes to society's common good:

> "[…] every individual necessarily labors to render the annual revenue of
> the society as great as he can. He generally, indeed, neither intends to
> promote the public interest, nor knows how much he is promoting it. By
> preferring the support of domestic to that of foreign industry, he intends
> only his own security; and by directing that industry in such a manner as
> its produce may be of the greatest value, he intends only his own gain, and
> he is in this, as in many other cases, led by an invisible hand to promote an
> end which was no part of his intention. Nor is it always the worse for the
> society that it was no part of it. By pursuing his own interest he frequently
> promotes that of the society more effectually than when he really intends
> to promote it. I have never known much good done by those who affected
> to trade for the public good."

For instance, consider the case of the great American inventor Thomas Alva

Edison. Among his many inventions was the long-lasting filament incandescent light

bulb. While Edison's discovery was a great contribution to science with many practical,

life-improving applications as well, Edison was not a philanthropist as first. He was an

entrepreneur who led a team of researchers and whose lab was funded by private

investors who expected a return on investment. Edison's foremost intent may not have

been to promote the public interest, but that was exactly what occurred.

While Adam Smith laid the foundation for the theory of entrepreneurship, it was

Joseph Schumpeter who further cemented entrepreneur's value in economic analysis. In

Schumpeter's (1911, 1942) view, the capitalist system at its best is characterized by

"creative destruction," where old ideas are constantly challenged and supplanted by new, better ideas, this survival of the fittest being the driving force behind economic progress.

Surowiecki's (2005) short account of the history of the U.S. car industry serves as a fine example of creative destruction. At the end of the 19th century there were hundreds of car manufacturers in the U.S. By the early 20th century, only a handful still existed. What happened? At the time, there was a wide-spread sense that the automobile could revolutionize the entire field of transportation, but no one knew exactly what the proper specifications should be, including the source of power for the vehicles (gasoline, steam, battery). The early automobile entrepreneurs presented to the market their vision of the automobile and consumers then voted with their money. In the end, consumers ended up with fine automobiles, the successful entrepreneurs were rewarded for their hard work and willingness for risk-taking, and the resources used for the unsuccessful designs were released for promising alternative uses in the economy.[2] In essence, this is the way a market economy works.
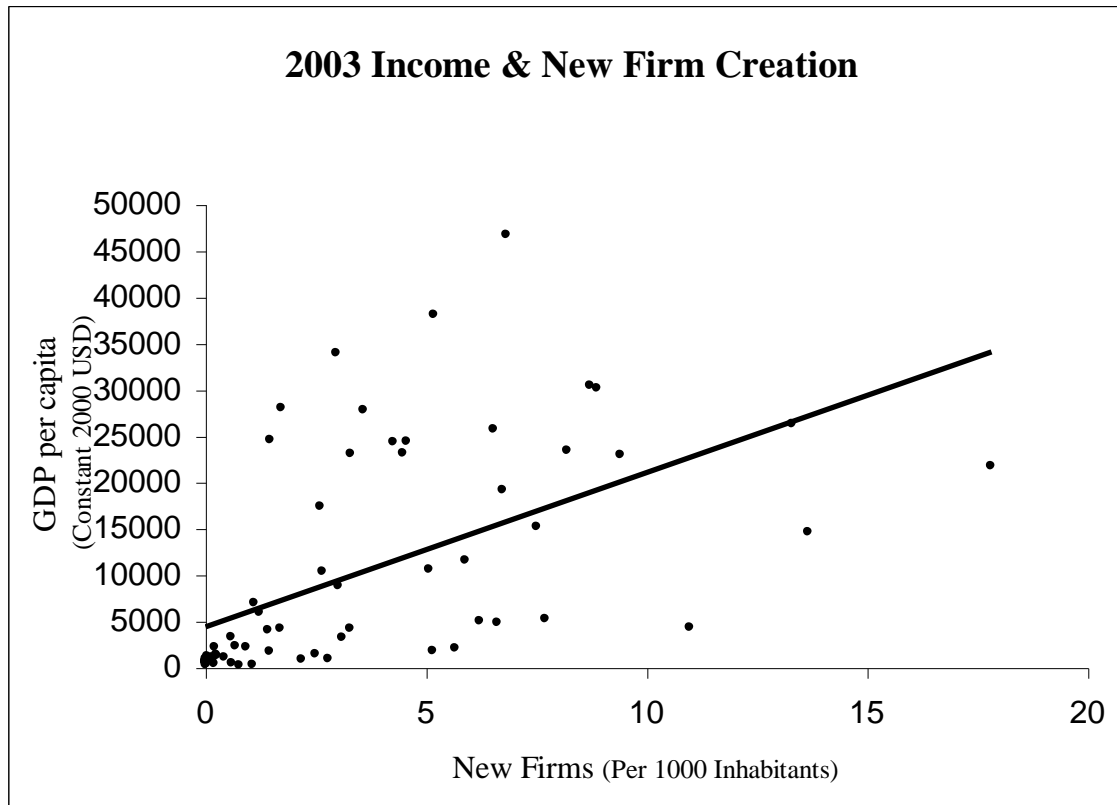
It is this dynamic environment of markets and competition that has produced a constant stream of great inventions over the last two and a half centuries.[3] Again, while the above inventions made many of the inventors fabulously wealthy, it was society as a whole that was the true beneficiary of this individual initiative. *Table 1*, created from our data sample of 64 countries, shows a typical relationship one can find between the rate of

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[2] Even a person as qualified and successful as Thomas Edison failed to predict the future of the automobile industry: his battery-powered vehicle ended in the same dustbin of history as hundreds of other designs.
[3] As chronologically listed in Craughwell (2008), these include such life changers as bifocals (Franklin, 1764), balloon (Montgolfier, 1783), battery (Volta, 1791), pencil (Conte, 1795), vaccination (Jenner, 1796), tin can (Durant 1810), mechanical reaper (McCormick, 1831), camera (Daguerre, 1839), vulcanized rubber (Goodyear, 1844), elevator (Otis, 1852), dynamite (Nobel, 1866), typewriter (Sholes, 1872), blue jeans (Davis & Strauss, 1873), internal combustion engine (Otto, 1867), automobile (Benz, 1885), radio (Marconi, 1895), X-ray (Röntgen, 1895), safety razor (Gillette, 1901), plastic (Baekeland, 1907), zipper (Sundbäck, 1917), TV (Farnsworth, 1927), Penicillin (Fleming, 1928), nylon (Carothers, 1928) and helicopter (Sikorsky, 1939)

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entrepreneurship and income: nations with a high number of new firms (creative

destruction at work) also tend to have high incomes as measured by GDP per capita.

Table 1: Entrepreneurship and Income

2003 Income & New Firm Creation

(Chart with y-axis "GDP per capita (Constant 2000 USD)" ranging from 0 to 50000, and x-axis "New Firms (Per 1000 Inhabitants)" ranging from 0 to 20)
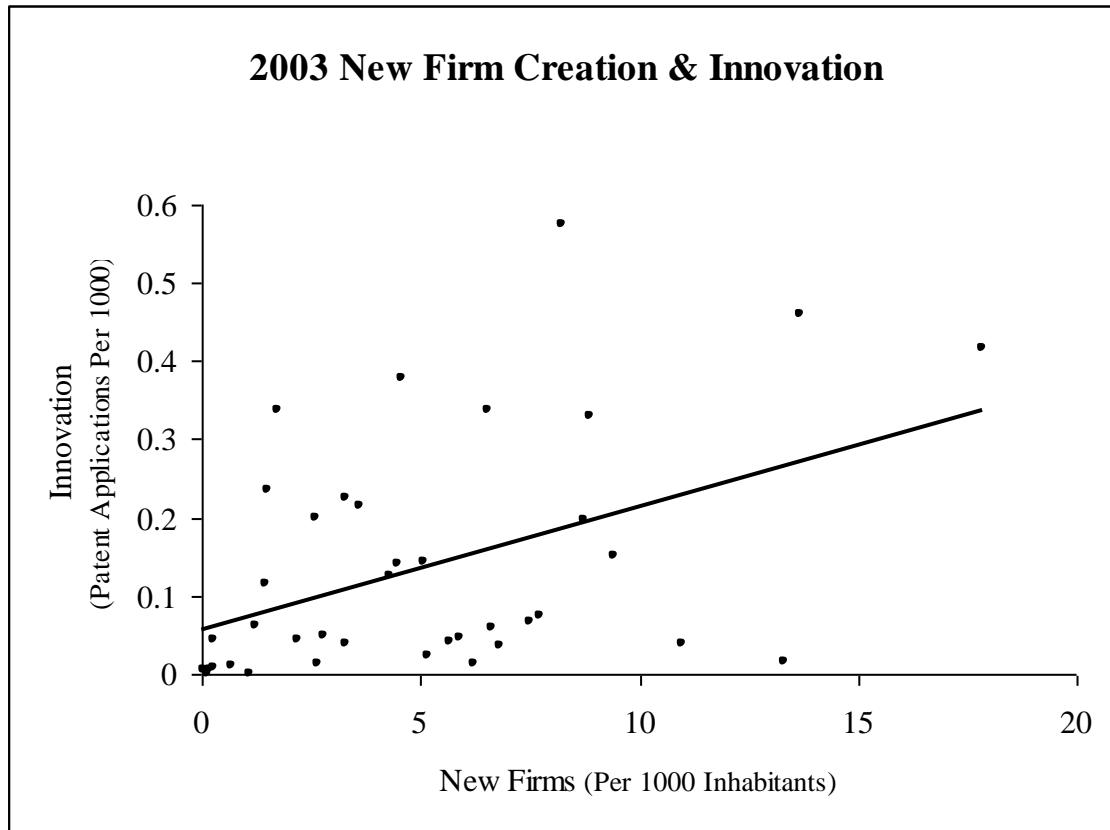
Source: The World Bank, authors' calculations.

While a great number of new firm start-ups will never become the revolutionary

innovators and entrepreneurs of the type of Edison, it is also true that when the number of

new firms created in a given year increases, so will the number of new innovative firms.

Table 2 below incorporates the 64 countries used in this study, and shows the statistical

relationship between new firm creation and innovation as measured by the number of

patent applications.[4]

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[4] Pearson's product moment correlation coefficient calculated for all 64 nations in the sample between new firms and patent applications is 0.79.

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Table 2: Entrepreneurship and Innovation

2003 New Firm Creation & Innovation

Source: The World Bank, authors' calculations.

The above relationship implies that although new firm creation is not a direct measure of innovation, it can be a fairly good predictor of innovative activity in society. An economy with a large amount of entrepreneurial activity is likely to have much innovation as well. Given that entrepreneurial activity promotes both competition and innovation, it seems justifiable for policymakers to promote policies that encourage entrepreneurship in general – and not be too concerned about the particular type of entrepreneurship being created. After all, picking winners in the market place is known to be notoriously difficult. One way governments can help in wealth creation is to create a business environment conducive to entrepreneurship.

3. Literature Review

Risk-aversion, credit availability, and entry regulations have been the focus of many recent studies on entrepreneurship. Norton and Moore (2006) showed that the decision to start a business rests in the risk-taking propensity of the individual. When nascent entrepreneurs assess their new firm launch decisions they will be more willing to enter the market when risk due to a poor business environment, such as unpredictable changes in regulations, is reduced, making potential profits (or losses) reasonably calculable. Gelderen, Thurik and Bosma (2006) found equally that a high amount of risk, especially perceived risk, is a good predictor of whether nascent entrepreneurs make it through the pre-start up phase, bridging the gap between deciding to enter a market and actually doing so. Through a predictable use of policies, governments can aid in reducing this uncertainty.

Start-up capital is another key barrier to market entry. No matter how sound a business plan may be, lack of start-up funds can stifle any attempt. Some studies, such as Ovaska and Sobel (2005) and Hanley and Girma (2006), found a positive relationship between credit availability and the rate of entrepreneurship, while others, such as Hurst and Lusardi (2004) found no robust relationship. Boadway and Sato (1999) proposed that government, through public collection and provision of information, should try to increase the efficiency of credit markets, and therefore, credit availability. De Meza (2002), on the other hand, pointed out that public policies that increase credit availability (by intervening in markets) will create a moral hazard by encouraging more risk-taking by banks and entrepreneurs. Since the outcome from this may be far worse than from no

intervention, a *laissez-faire* approach for governments in dealing with private credit markets is suggested.

Given the difficulty of obtaining loans, many entrepreneurs may instead choose to use trade credit to overcome financial barriers. Huyghebaert (2006) argued that one reason why trade credit is used heavily is because suppliers are better than banks in evaluating the credit risk of new firms in the same industry as they are. For the trade credit system to work, though, society must have strong property rights and contract enforcement in place, another business environment factor that government can influence.

A third option available to a starting entrepreneur who lacks start-up funding is to save more from early on. Parker (2000) and Ghatak, Morelli, and Sjostrom (2001), for instance, showed how the promise of future rents from entrepreneurial activity provide incentives to young workers to increase their savings in order to enter self-employment later on in life. Here a nation's tax system plays a particularly important role in affecting the choice to become an entrepreneur.

Besides personal risk perceptions and characteristics and credit availability, as already argued, entrepreneurial activity is also indirectly affected by the quality of economic institutions. Johnson, McMillan, and Woodruff (2000) used survey data to explore how credit availability and security of property rights affect employment growth at the firm level. They found that protection of property rights was an important factor in explaining employment growth in entrepreneurial firms while access to external finance was not. This implies that financial aid intended to stimulate employment growth may be most effective when used for policies enhancing property rights.

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McMillan and Woodruff (2002) also found that institutional quality matters greatly in explaining new firm creation. Corruption dissuades entrepreneurs from investing and it increases the likelihood of firms choosing not to fulfill contracts – a great deterrent to entrepreneurs. Manolova and Yan (2002) showed that business environment thick with corruption causes entrepreneurs to tend towards opportunistic rent seeking rather than exploring market opportunities. In a corrupt environment, the economic success of an entrepreneur is more easily defined by her political, rather than business, prowess.

In an industrial organisation study of 85 nations Djankov et al. (2002) found that regions with high regulatory barriers to firm entry also tend to have high corruption and large unofficial economies. A high level of government regulation is sometimes explained by corrupt bureaucrats relying on regulation fees and unofficial payments from entrepreneurs seeking to circumvent these regulations.

Klapper (2006) provided a short overview of the relationship between business environment and start-ups. In this introduction to the World Bank/IFC Entrepreneurship dataset a negative correlation was found between barriers to entry and new firm creation. Furthermore, business environment was found to correlate positively with the rate of entrepreneurship; however, this relationship was not explored beyond a simple correlation. Klapper, Laeven and Rajan (2006) further studied the link between entry barriers and entrepreneurship in 20 nations. They found that while entry regulations hinder the entry of new firms, the result changes for nations that have high corruption or lack property rights. Although many corrupt nations also have high regulatory barriers, entrepreneurs are not so concerned about them because one can get around these barriers by bribing officials.

4. Methodology, Model, and Data

This study is an empirical investigation of variables explaining new firm creation. Of particular interest are variables related to the quality of a nation's government-created business environment. The data used in the statistical estimations was constructed from several sources, including the World Bank, International Finance Corporation (IFC), The Wall Street Journal (WSJ) and the Heritage Foundation, and Transparency International. At the time of writing data availability restricted this dataset to a cross-section of 64 countries in the year 2003. In the data set, small firms (<50 workers) account for 96% of all firms, and small and medium sized enterprises (< 250 workers) account for 58% of national employment. While the data set is best available for the purpose, business registry data does have some known limitations: For instance, in countries where the unofficial economy is important, the true number of new firms is likely to be higher than the register shows, the registration data then underestimating the true creation rate.

In this study six variables are used to quantify different aspects of business environment. The first of these measures is the Heritage Foundation / Wall Street Journal Index of Economic Freedom (IEF). The index is calculated as an unweighted average of 10 categories, which are: business freedom, trade freedom, soundness of monetary policy, freedom from government intervention, soundness of fiscal policy, property rights protection, investment freedom, banking security, freedom from corruption and labor freedom. Countries are assigned one composite score including all ten categories, the overall score ranging from 0 (unfree) to 100 (free).

Property rights is one of the ten components of the IEF. Given the importance of strong property rights to economic development, separate regressions are also run using

property rights in lieu of the full IEF. In order to earn top marks in this category, the government must guarantee property rights, courts must enforce contracts quickly and sanction those who violate the laws. This measure provides a rough sense of how well business contracts are enforced in a country.

The third business environment measure in this study is Transparency International's Corruption Perceptions Index (CPI), which utilizes survey data to quantify perceptions of corruption in over 150 nations. Though the data is limited as it measures perception of corruption and not the actual incidents, recalling the work of Gelderen et al. (2006) it is clear that the perception of risk can be just as important as the risk itself in deciding whether to start a business or not.

The fourth, fifth and sixth measures of business environment are related to the regulatory burden of starting a business. This cost of business start-up data comes from the IFC *Doing Business* publication. This data, measuring the burden (number of application procedures, expected wait, fees) of complying with regulation before one may operate a legal business, is collected from official commercial codes, regulations, fee schedules, and incorporation lawyers.[5]

The sample used for this paper includes year 2003 and sixty-four nations.[6] Coverage of the dataset across regions of the world is summarized in *Table 3* below, and the full list of countries is included in Appendix B.

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[5] In the collection of the procedures data it was assumed that while procedures may occur simultaneously, they will take a minimum of one day to complete and may not start on the same day. Though it may take seven procedures to register a business, and all can be completed by filling out forms in a single day, it will be calculated as a full week to get the business started.

[6] 43 of the 64 nations included in the sample identify Christianity as the primary religion, which is known (see Iannaccone, 1998) to foster economic development. While not shown in the regressions, the effect of Christianity on new firm creation was also tested. It was found to be positively correlated with new firm creation; however, it was not a strong relationship.

Table 3. Regional Distribution

Region	Number of Countries
Asia	17
Africa	8
Europe / North America	30
Oceania	2
South America / Caribbean	7

As shown in *Table 4*, the nations that appear in the sample have a mean new firm creation rate of 3.4 firms per 1000 people, GDP per capita of $10,480, and economic freedom index score of 63.4 out of 100. Starting a business in this sample takes

Table 4. Selected Descriptive Statistics

[Year 2003]			BUSINESS ENVIRONMENT MEASURES					
			(1)	(2)	(3)	(4)	(5)	(6)
	New Firms (Per 1000 People)	GDP per Capita (Year 2000 USD)	Economic Freedom (100-Point Scale)	Property Rights Protection (100-Point Scale)	Corruption (10-Point Inverted Scale)	Number of Required Start-Up Steps	Start-Up Time (Days)	Start-Up Cost (% of per capita GNI)
Mean	3.74	10,480	63.4	57.8	5.0	8.9	46.2	33.3
Maximum	17.8	46,659	89.3	90	8.6	15	168	257
{Country}	Australia	Luxembourg	Hong Kong	>1 country	Nigeria	>1 country	Indonesia	Yemen
Minimum	0.01	146	37.5	10	0.3	2	2	0
(Country)	Yemen	Malawi	Syria	Bosnia Herz.	Finland	>1 country	Australia	Denmark
Obs.	64	64	64	64	64	61	61	61
Selected Countries								
Australia*	17.8	21,696	77.6	90	1.2	2	2	2
Canada	4.28	24,254	74.6	90	1.3	2	3	1
Yemen**	0.01	584	46.1	30	7.4	12	72	257

* Highest new firm creation rate in the sample.
** Lowest new firm creation rate in the sample.

on average 46 days and 9 independent bureaucratic procedures, and the regulatory burden is one third of an average individual's annual income.[7]

Regression results for this paper were estimated using ordinary least squares. In addition to the six business environment variables, the model also includes three base control variables. These variables - explained in more detail in *Table 5* - were chosen based on the previous studies by Djankov et al. (2002), and Ovaska and Sobel (2005). The empirical model is summarized in equation (1) below:

$$(1) \qquad Y = \alpha + \beta X_i + \gamma Z_j + \varepsilon$$

where Y, the dependent variable, is a vector of new firm start-ups for the 64 countries, and α is the constant. The matrices X_i and Z_j partition the matrix of regressors into two groups as follows:

> X_i : A set of three control variables included in all empirical tests.

1. GDP per capita
2. Credit Availability
3. Working Age Adults as a Percentage of Total Population

> Z_j : A set of six regressors investigating business environment's effect on new firm creation.

1. Economic Freedom
2. Property Rights Protection
3. Corruption
4. Number of Procedures to Start a Business
5. Time to Start a Business
6. Regulatory Cost of Starting a Business

The three direct costs of firm start-up including cost of starting a business, time to start a business, and number of procedures to start a business are measures constructed by the World Bank's IFC to assess the cost of complying with start-up regulations. While all

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[7] A full table of descriptive statistics is available in Appendix D.

three of these variables measure cost, they are not highly correlated with one another,
capturing somewhat different aspects of the cost barrier to entry. As a consequence, some
regression equations were estimated using multiple business environment variables
simultaneously. A correlation matrix for all variables appears in Appendix C.

A short description of the dependent and independent variables as well as
expected signs of the regression are presented in *Table 5* below.

Table 5: Description and Expected Sign of the Variables

Variable	Description	Expected Sign
New Firms	The number of new firms registered adjusted per 1000 inhabitants	Dependent Variable
GDP per capita (Constant 2000 USD)	Higher incomes represent the ability to obtain goods and services. Additionally, nations with a high per capita income are more likely to have more educated citizens with greater human capital; both of which are important for entrepreneurship. Some previous studies, such as Ovaska and Sobel (2005), indicate that GDP per capita may have a positive effect on new firm creation.	(+)
Credit Availability (Domestic Credit Available to the Private Sector as a % of GDP)	Starting a business can be expensive. Hanley and Girma (2006) found that the ability of nascent entrepreneurs to obtain credit from the banking sector has a positive effect on new firm creation as these individuals can better overcome adverse financial shocks. On the other hand, Hurst and Lusardi (2004) found no robust relationship between credit availability and new firm creation.	No clear hypothesis
Working Age Individuals (15 – 64 years) as % of Total Population	The risk preferences as well as energy levels of individuals can change over time. It is expected that demographics will play a role in explaining new firm creation because the majority of entrepreneurs are of working age. In their comparative study of Germany and India, Thakur et al. (2008) found a significant relationship between a country's demographic structure and new firm creation rate. Therefore, the proportion of working age adults in the economy is expected to have a positive effect on new firm creation.	(+)
Dependency Ratio (Number of dependants per worker)	Individuals with a greater number of dependants may be relatively risk averse and, therefore, prefer steady employment in a well-established, stable firm. In their micro-study, Gelderen et al. (2006) found that the level of perceived risk has a negative effect on new firm creation, and starting a business is risky. The U.S.	(−)

Bureau of Labor Statistics, for instance, reported that of all firms established in 1998, only 44% were still in existence after four years.[8]

Index of Economic Freedom (Score out of 100)	Prepared by the Heritage Foundation, this index is an aggregate measure of the prevailing economic freedom in a nation. The index is calculated based on ten categories including: business freedom, trade freedom, monetary policy soundness, freedom from government intervention, soundness of fiscal policy, property rights protection, investment freedom, banking security, freedom from corruption, and labor freedom. It is expected that economic freedom will have a positive effect on new firm creation.	(+)
Protection of Property Rights (100-Point Scale)	The ability of an individual to hold property that is protected and enforced by state is important to the entrepreneur's certainty of reaping the profits of their activities. The protection of property rights is measured on a scale of 0 to 100. This variable is one of the ten factors that the Heritage Foundation uses in calculating its broader index of economic freedom.	(+)
Corruption Index (Ten-point Scale)	Transparency International's Corruption Perceptions Index (CPI) is used to measure government corruption including unofficial payments to state bureaucrats. The CPI is measured with a value of 10 being least corrupt and 0 representing widespread corruption. In this study the poles are reversed so that a lower score is equated with lower corruption. It is expected that corruption will have a negative effect on new firm creation.	(−)
Cost of Starting a Business (% of GNI per capita)	The World Bank / IFC measures the cost of starting a business as the cost of complying with regulations in order to operate a business legally. The cost is calculated relative to a nation's per capita income. It is expected that an increasing cost of start-up will negatively affect new firm creation.	(−)
Number of Procedures Required to Start a Business	The number of procedures required to start a business is a measure of government bureaucracy. When bureaucratic red tape is great the entrepreneur may find the costs of dealing with the start-up process to be prohibitively high. While a fairly rough measure of the potential regulatory burden, this variable, constructed by the World Bank / IFC, is expected to have a negative impact on new firm creation.	(−)
Time Required to Start a Business (Days)	The time required to start a business has an opportunity cost. In nations with heavy bureaucracy this can become prohibitive when the amount of time is so great that the entrepreneur would be better to spend that time in her next-best economic pursuit. The time measured in days to set-up a new business is collected by the World Bank / IFC and is expected to have a negative impact on new firm creation.	(−)

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[8] See the U.S. Bureau of Labor Statistics' Monthly Labor Review, May 2005.

5. Findings

The regression results presented in *Table 6* below are estimated using a sample of 64 nations in year 2003. [9] The results show that the model in its 14 specifications explains between 35 and 43 percent of the cross-country variation in the number of new firms created. The main findings are also found to be reasonably robust to changes in specifications.

The results show that the factors most significant in explaining new firm creation are working adults as a portion of population, and some, but not all measures of business environment. The first column shows that the adult population control variable has a positive coefficient and is statistically significant in every regression. The indirect business costs representing risk to the entrepreneur; economic freedom, corruption, and property rights are statistically significant whenever included. The direct regulatory costs of starting up a firm, on the other hand, are insignificant in explaining new firm creation.

The Heritage Foundation / WSJ Index of Economic Freedom (IEF) is included in the first column, representing the broadest interpretation of business environment. The variable is statistically significant and positive as expected, taking on a coefficient of 0.123. In the following two columns of the table the economic freedom index variable is replaced by two other measures of the business environment; protection of property rights and government corruption. Due to the potential problem of multicollinearity, economic

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[9] The cross-country setting has its limitations. For example, one may be more inclined to start a business if there is a family history of entrepreneurship. This is a part of the entrepreneurial 'spirit' that Schumpeter mentions as an important factor in entrepreneurial supply. Such items would be best studied at micro-level.

freedom was not regressed together with property rights or corruption. Individually, both property rights and corruption were statistically significant and of the expected signs. While the protection of property rights and government corruption are closely related to economic freedom, they are not equivalents. The measure of property rights protection is used to capture the effect of government adherence to law regarding private property. Transparency International's index of government corruption is included to capture the effect of unofficial and illegal bureaucratic payments by entrepreneurs to government. Although the economic freedom index includes these two effects as part of its calculation, the latter two variables may be more precise measures of these specific effects.

The results confirm the previous findings of Johnson, McMillan and Woodruff (2000) that also show that credit availability is less important in explaining new firm creation than property rights protection. In fact, as also in Hurst and Lusardi (2004), credit availability was found to be insignificant across all regressions. This is contrary to the findings of Ovaska and Sobel (2005) and of Hanley and Girma (2006). It seems that entrepreneurs in this sample are overcoming financial constraints, if any, through trade credit or savings. Further to the work of Johnson, McMillan and Woodruff (2000) and McMillan and Woodruff (2002), who find that property rights are important in explaining entrepreneurship, the results of this paper indicate that protection of property rights is indeed a significant factor in explaining new firm creation. Column 2 of *Table 6* places the coefficient of property rights protection at 0.077. Therefore, a nation that improves its property rights protection score by one point (out of 100) will increase the number of

Table 6: Regression Estimates for 2003 New Firm Creation Equations

Dependent variable: New Firms Registered per 1,000 citizens

Specification →	1	2	3	4	5	6
Constant	-16.58***	-13.55***	-3.34	-12.45***	-8.05*	-10.94***
	(4.32)	(4.04)	(0.57)	(2.52)	(1.89)	(2.79)
GDP per capita (Thousands)	0.06	0.006	-0.059	0.123**	0.062	0.108**
	(1.40)	(0.09)	(0.78)	(2.13)	(0.99)	(1.91)
Credit Availability	-0.002	-0.001	-0.007	0.005	0.006	0.004
	(0.21)	(0.13)	(0.63)	(0.43)	(0.54)	(0.38)
Adult Age Citizen (% of total)	0.186***	0.199***	0.208***	0.224***	0.205***	0.213***
	(3.02)	(3.61)	(3.19)	(2.81)	(3.38)	(3.40)
Dependancy Ratio (Dependants per Worker)	---	---	---	---	---	---

Business Environment		1	2	3	4	5	6
	Economic Freedom	0.123***	---	---	---	---	---
		(2.612)					
	Protection of Property Rights	---	0.077***	---	---	---	---
			(2.45)				
	Corruption (Inverse of CPI)	---	---	-1.072**	---	---	---
				(2.23)			
	Cost of Starting a Business	---	---	---	0.001	---	---
					(0.23)		
	Number of Procedures to Start a Business	---	---	---	---	-0.293	---
						(1.57)	
	Time Needed to Start a Business	---	---	---	---	---	-0.012
							(0.94)

	1	2	3	4	5	6
Observations	64	64	62	61	61	61
Adjusted R^2	0.43	0.43	0.43	0.35	0.39	0.36

Notes: White heteroscedasticity corrected estimates.
Absolute t-statistics in parenthesis. ***, **, * denotes significance
at the 1%, 5%, and 10% levels respectively.

Table 6: <u>Continues</u>

Dependent variable: New Firms Registered per 1,000 citizens

	Specification	7	8	9	10	11	12	13	14
	Constant	-16.4***	-10.65***	-12.93***	-4.176	-2.66	-2.62	-1.38	-1.15
		(3.35)	(2.41)	(3.21)	(0.59)	(0.41)	(0.40)	(0.42)	(0.33)
	GDP per capita (Thousands)	0.0005	-0.011	-0.003	-0.084	-0.078	-0.089	0.06	0.07
		(0.01)	(0.13)	(0.03)	(0.79)	(0.77)	(0.85)	(1.39)	(1.33)
	Credit Availability	-0.002	0.0006	-0.002	-0.007	-0.004	-0.007	-0.001	-0.004
		(0.18)	(0.06)	(0.15)	(0.57)	(0.35)	(0.55)	(1.40)	(0.39)
	Adult Age Citizen (% of total)	0.238***	0.197***	0.199***	0.227***	0.205***	0.208***	---	---
		(3.24)	(3.38)	(3.34)	(2.82)	(3.05)	(3.00)		
	Dependency Ratio (Dependants per Worker)	---	---	---	---	---	---	-6.05***	-6.99***
								(2.82)	(2.63)
Business Environment	Economic Freedom	---	---	---	---	---	---	0.125**	0.128**
								(2.65)	(2.32)
	Protection of Property Rights	0.08**	0.056*	0.073**	---	---	---	---	---
		(2.19)	(1.94)	(2.09)					
	Corruption (Inverse of CPI)	---	---	---	-1.141**	-0.921**	-1.093**	---	
					(2.02)	(1.84)	(1.99)		
	Cost of Starting a Business	0.006	---	---	0.003	---	---	---	0.004
		(1.29)			(0.67)				(0.62)
	Number of Procedures to Start a Business	---	-0.196	---	---	-0.152	---	---	---
			(1.14)			(1.00)			
	Time Needed to Start a Business	---	---	-0.008	---	---	-0.008	---	---
				(0.66)			(0.79)		
	Observations	61	61	61	59	59	59	64	61
	Adjusted R^2	0.40	0.41	0.40	0.40	0.41	0.40	0.42	0.38

Notes: White heteroscedasticity corrected estimates.
Absolute t-statistics in parenthesis. ***, **, * denotes significance
at the 1%, 5%, and 10% levels respectively.

new firms registered per 1000 inhabitants by 0.077. For instance, for France, which has

new firm creation rate of 3.31 (close to the sample mean), an increase in property rights

protection of 1 point (from 70 to 71) would increase the number of new firm registrations by 4622 (a 2.3% increase).

Interestingly, the coefficient for the measure of government corruption used in column three of *Table 6* is much larger than that for property rights. This is contrary to the findings of Klapper, Laeven and Rajan (2006), who argued that corruption in some cases has a positive effect on new firm entry to markets. Our results indicate that at the macro-level, corruption is clearly bad for new firm creation. In fact, when government corruption goes down by one point on Transparency International's index, the number of new firms per capita goes up by 1.07. For any nation experiencing a decrease in government corruption consistent with a one-point change in index score it would mean a very large increase in the number of new firms created in a given year. For instance, in the poor and corruption stricken nation of Azerbaijan, with a population of 8.2 million, a one-point decrease in corruption would mean, according to our model, an additional 8810 new firms. This would be a welcome boost to any country, but especially to those with low income.

In columns four, five, and six of the results we add the variables representing start-up costs. All three of the measures of start-up costs are statistically insignificant. In fact, none of these costs became statistically significant in any estimated equation. Interestingly, this finding is robust to the inclusion of other measures of business environment as in columns 7 through 14 of *Table 6.* It appears that in considering the long-term entrepreneurial rents, the immediate regulatory start-up costs are not that important.

Overall, the results of this paper demonstrate that a positive business environment, through decreased corruption, improved institutions, and protection of

property rights is positively correlated with new firm creation. The result should be of particular interest for nations that fare poorly in these areas. Based on our estimates, even a small improvement in business environment already has a noticeable positive effect on new firm registrations. This should be of major interest for policymakers wishing to increase the welfare of a nation through entrepreneurship.

Another important policy implication of this paper concerns demographic change. Many industrial nations experienced high fertility rates between the mid-1940's and early 1960's, with much slower population growth following thereafter. As this group of working age individuals, comprising the bulk of current entrepreneurs, begins to retire, many of them will likely not be replaced because of the low birth rates of recent decades. Therefore, new firm creation rates may fall drastically, *ceteris paribus*, as the baby-boomers retire. This is particularly true for many industrialized nations.

Canada serves as a fine example of the latter problem. When its working age population decreases by just one percentage point (by about 200,000 people), the results of this paper imply that new firm creation will decrease by 0.2 firms per 1000 people or 6326 firms across the nation. Due to the longevity of baby-boomers and subsequent pressure to relax mandatory retirement laws, it may be that many baby-boomers will continue to work past the age of 65 so this decrease in new firm creation may not happen all at once. But it is likely to happen eventually, since the population simply is not being replaced at the same rate as in the past. Based on our estimates an extra effort by governments to enhance the business environment would go a long way to mitigate the economic effect of this demographic change.[10]

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[10] Canada, for instance, does fare well in all the business environment categories found important in this study (economic freedom, property rights, corruption). While Canada is ranked "mostly free" in the Heritage Foundation / WSJ Economic Freedom Index, the areas of economic freedom and policies where

6. Conclusion

This paper has explored how business environment affects entrepreneurship as measured by new firm creation. Six measures of business environment were used including; economic freedom, property rights, corruption, cost of start-up, time required for start-up, and number of procedures required for start-up. This paper utilized the latest new firm creation and business start-up data provided by the World Bank / IFC in a cross-country setting of 64 countries in the year 2003.

The study finds that economic freedom, property rights, and corruption are statistically significant in explaining new firm creation. The three measures of start-up costs used, including cost as a percentage of GNI, number of bureaucratic procedures, and time in days required to start a business were found to be of little importance in explaining new firm creation. Of the control variables used, credit availability was not found to be statistically significant in explaining new firm creation, while the percentage of working adults in the population was significant.

The results highlight the fact that demographic change will significantly lower the future rate of entrepreneurship especially for nations with a large baby-boom generation entering retirement. One way to reduce the negative effect of an aging population on new firm creation will be for governments to adhere to policies that encourage a first class business environment conducive to entrepreneurial activity. In this study we found that regardless of a country's development state, even modest improvements in business

Canada has lost most points include: regulatory regimes affecting foreign investment (incl. telecommunications, publishing, broadcasting, aviation, mining and fishing), requirement of import permits (incl. certain goods in agriculture, textiles, atomic energy, drugs and cars), and a high share of government owned enterprises. In addition, one policy fighting the demographic change specifically is a more liberal immigration policy. In this respect Canada has been relatively active when compared to many of its peers. In case a good portion of the immigrants is underage, this policy's effectiveness will have a little lag.

environment, as quantified by the Heritage Foundation / WSJ, the World Bank and

Transparency International, have a measurable positive effect on new firm creation.
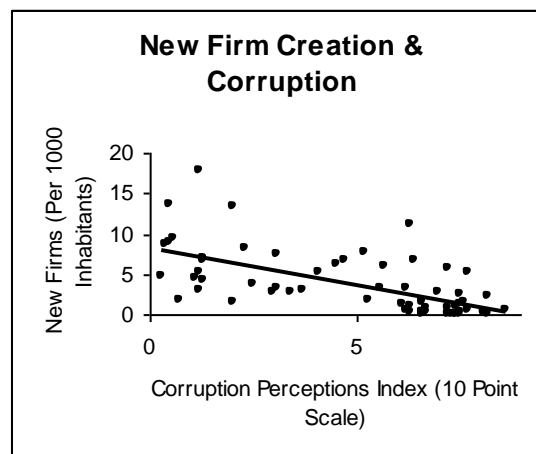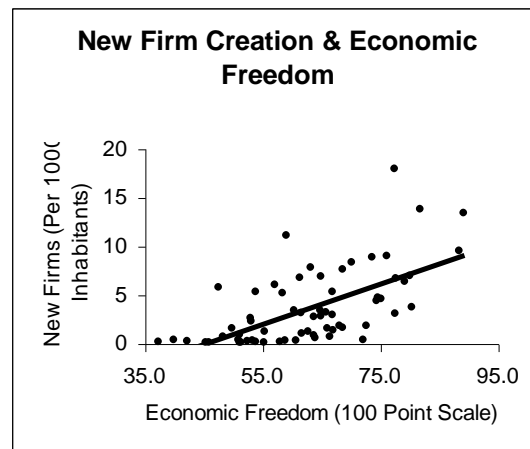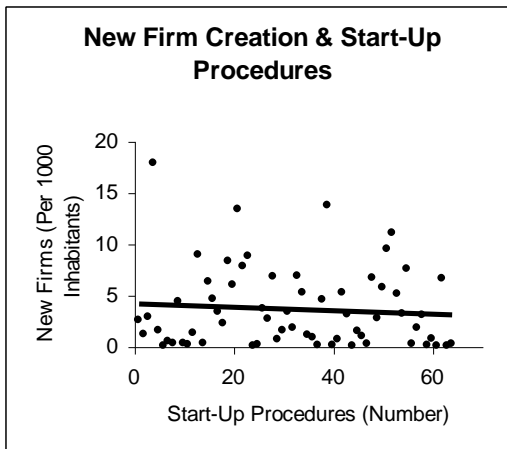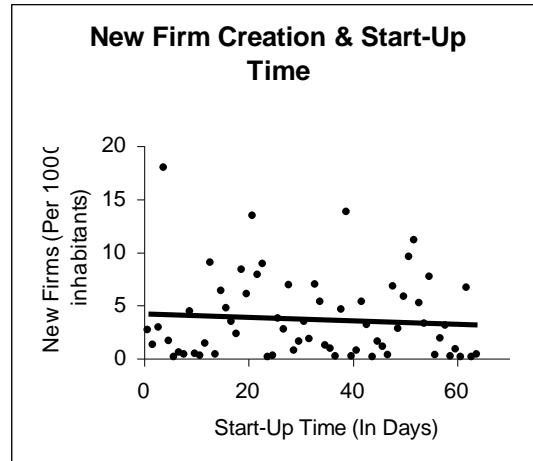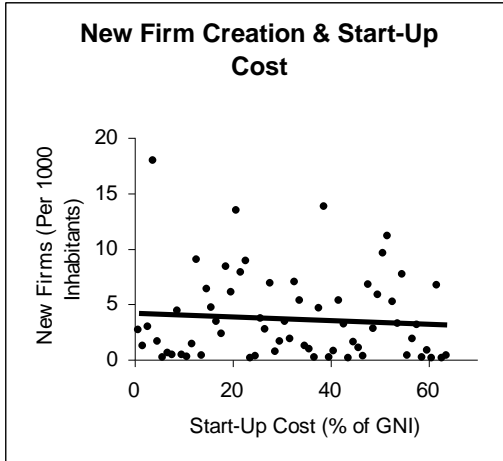
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Appendices

Appendix A: Business Environment Scatter Plots

New Firm Creation & Start-Up Cost

New Firms (Per 1000 Inhabitants) vs. Start-Up Cost (% of GNI)

New Firm Creation & Start-Up Time

New Firms (Per 1000 inhabitants) vs. Start-Up Time (In Days)

New Firm Creation & Start-Up Procedures

New Firms (Per 1000 Inhabitants) vs. Start-Up Procedures (Number)

New Firm Creation & Economic Freedom

New Firms (Per 1000 Inhabitants) vs. Economic Freedom (100 Point Scale)

New Firm Creation & Property Rights

New Firms (Per 1000 Inhabitants) vs. Property Rights Protection (100 Point Scale)

New Firm Creation & Corruption

New Firms (Per 1000 Inhabitants) vs. Corruption Perceptions Index (10 Point Scale)

Appendix B: Sample Nations

Albania	France	Luxembourg	Portugal
Argentina	Georgia	Macedonia, FYR	Romania
Armenia	Germany	Madagascar	Singapore
Australia	Greece	Malawi	Slovak Republic
Austria	Hong Kong, China	Mozambique	Slovenia
Azerbaijan	Hungary	Netherlands	South Africa
Bolivia	Iceland	New Zealand	Spain
Bosnia and Herzegovina	India	Nicaragua	Sri Lanka
Canada	Indonesia	Nigeria	Sweden
China	Ireland	Norway	Switzerland
Congo, Rep.	Israel	Oman	Syrian Arab Republic
Czech Republic	Italy	Pakistan	Thailand
Denmark	Jamaica	Panama	Togo
El Salvador	Kazakhstan	Peru	United Kingdom
Estonia	Latvia	Philippines	Yemen, Rep.
Finland	Lithuania	Poland	Zambia

Appendix C: Correlation Matrix of Variables

	New Firms (per 1000)	GDP per Capita	Credit Availability	Working Age Population	Dependency Ratio	Economic Freedom	Property Rights Protection	Corruption	Start-up Cost	Start-up Procedures	Start-up Time
New Firms (per 1000)	1										
GDP per Capita	0.53	1									
Credit Availability	0.48	0.76	1								
Working Age Population	0.50	0.41	0.46	1							
Dependency Ratio	-0.48	-0.42	-0.46	-1.00	1						
Economic Freedom	0.59	0.72	0.70	0.40	-0.40	1					
Property Rights Protection	0.59	0.86	0.73	0.41	-0.40	0.84	1				
Corruption	-0.61	-0.92	-0.79	-0.44	0.44	-0.79	-0.90	1			
Start-up Cost	-0.41	-0.45	-0.41	-0.66	0.67	-0.40	-0.48	0.48	1		
Start-up Procedures	-0.51	-0.64	-0.48	-0.33	0.32	-0.61	-0.70	0.71	0.47	1	
Start-up Time	-0.35	-0.46	-0.39	-0.25	0.25	-0.40	-0.47	0.46	0.49	0.63	1

Appendix D: Descriptive Statistics and Data Sources

	Data Source	Mean	Median	Max.	Min.	St. Dev.	Obs.
New Firms (Per 1000 People)	A	3.74	2.73	17.83	0.01	3.84	64
GDP per Capita (Thousands)	B	10.48	4.17	46.66	0.15	11.90	64
Credit Availability (% of GDP)	A	62.47	41.04	158.52	0.00	49.82	64
Dependency ratio (Dependents per Worker)	B	0.56	0.51	1.00	0.37	0.15	64
Working Age Population (% of Total)	B	64.59	66.33	73.14	49.92	5.54	64
Economic Freedom (100-Point Scale)	C	63.39	63.93	89.30	37.49	11.52	64
Property Rights Protection (100-Point Scale)	C	57.81	50.00	90.00	10.00	24.59	64
Corruption (10-Point Scale)	D	4.96	6.20	8.60	0.30	2.67	64
Start-Up Procedures (Number)	A	8.85	9.00	15.00	2.00	3.47	61
Start-Up Time (Days)	A	46.21	38.00	168.00	2.00	34.37	61
Start-Up Cost (% of GNI)	A	33.32	12.40	257.00	0.00	50.07	61

Data Source Codes:

A	The World Bank Group / International Finance Corporation: *Doing Business*. Washington, DC. Available online at www.doingbusiness.com.
B	The World Bank: *The World Development Indicators*. Washington DC. Available online at www.worldbank.org/data.
C	The Heritage Foundation / The Wall Street Journal: *Index of Economic Freedom*. Washington, DC and New York. Available online at www.heritage.org/index.
D	Transparency International: *The Corruption Perceptions Index*. Berlin, Germany. Available online at www.transparency.org/cpi.