Availability of Financing, Regulatory Business Costs and National Entrepreneurial Propensity

Yuen-Ping Ho (nechoyp@nus.edu.sg)
Poh-Kam Wong (pohkam@nus.edu.sg)

Entrepreneurship Centre
National University of Singapore

Draft dated 31st July 2005

Abstract

In this paper, we focus on two barriers to entry that may hinder the formation of new firms: capital requirements and regulatory business cost. The contribution of this paper is twofold: we compare the availability of different types of financing sources to address the issue of capital requirement and we utilise a new measure of business cost by constructing a composite index using data from the World Bank's Doing Business Database. Using cross-sectional data on 37 countries that participated in the 2002 Global Entrepreneurship Monitor, we examine the effect of availability of financing and regulatory business costs on the propensity of three different types of entrepreneurial activity: opportunity-driven, necessity driven and high-growth potential new firm formation. The availability of three types of financing sources is analysed: traditional debt financing, venture capital financing, and informal investments. The findings show that only informal investments significantly influence the propensity to be entrepreneurs. Regulatory business costs were found to deter opportunity driven entrepreneurship, but had no impact on other types of entrepreneurial activity.

1. Introduction

In examining the determinants of entrepreneurial propensity, the entrepreneurship literature is rich in studies that have focused on the psychological and demographic characteristics of individual business founders. More recently, researchers such as Specht (1993) have moved from the "traits" approach, to adopt a "rates" approach that focuses on factors that influence organisational formation at a more aggregated industry or national level. In this paper, we examine two such environmental factors that may act as entry barriers and negatively influence the rate of new firm creation in an economy: capital requirements and regulatory business cost. We study the influence of capital requirements by analysing the availability of financing sources that might ameliorate the problem of high capital requirements faced by entrepreneurs. This is in line with the GEM Conceptual Model that posits financial support and low market barriers as important factors in explaining what makes a country entrepreneurial (Reynolds et al., 2000).

Our choice to study capital requirements and regulatory costs is motivated by studies at the industry, firm and individual levels that have found these two factors to be important in deterring entry. Economists such as Bain (1956) and Stigler (1968) argued that incumbent firms enjoy absolute cost advantages over potential new entrants, having established economies of scale in capital-intensive processes. Few entrepreneurs are capable of acquiring the large amounts of capital required to enter markets at the minimum efficient scale and to operate competitively. In this way, capital requirements discourage the entry of new firms. In the strategic management literature, Michael Porter (1980) proposed six major sources of barriers, including capital requirements and government policies, the latter involving regulatory requirements for licences and permits for formation of new businesses.

Empirical studies have supported the hypotheses proposed by economic theory and Porter's (1980) framework. White (1982) found that the existence of small firms is negatively related to capital intensity. Studying entry rates of small firms of different sizes, Acs and Audretsch (1989) concluded that capital intensity in an industry serves as an entry barrier for small firms with fewer than 100 employees. Using data on 382 US manufacturing industries in 1977, and defining capital requirements as per Bain (1956), Dean and Meyer (1996) found that capital requirement significantly deterred new venture formation. Analysing executive perceptions at 49 Fortune 500 companies, Karakaya and Stahl (1989) found empirical support for Porter's concepts, although they acknowledged that these findings can only be generalised to larger firms. The deterrent effect of government-imposed costs on entrepreneurial intention has been observed in countries such as Peru (de Soto, 1989), Japan (Japanese Association of Small Business, 1999) and Russia (Huskey, 2005).

The other aspect of capital requirements as an entry barrier is access to capital. Surveys of individuals have found that liquidity constraints limit the entrepreneurial choice behaviour of individuals who may wish to switch to self-employment (Evans and Jovanovic, 1989; Bates, 1995). In a study on individuals who have developed business ideas but decided against launching new ventures, Van Auken (1999) found that financial constraints was the most significant obstacle standing in the way of business launch.

The contribution of this paper is twofold: we compare the availability of different types of financing sources to address the issue of access to capital and we utilise a new measure of regulatory business cost by constructing a composite index using data from the World Bank's Doing Business Database. In the next section, we present an overview of the literature on various financing sources and regulatory business costs and their role in entrepreneurial venture formation. The research questions and hypotheses investigated are developed in Section 3. In Section 4, we describe the methodology, data and analysis methods employed in this paper. Results from the analysis are presented in Section 5, with a discussion section following in Section 6.

2. Literature Review

2.1 Availability of Financing and Entrepreneurship

In the entrepreneurship literature, the importance of capital to new ventures is well accepted. The probability of individuals becoming entrepreneurs is found to increase with their assets-size (Evans and Leighton, 1989; Holtz et al., 1994). As a determinant of firm formation, capital is important because it influences not only the ability of firms to enter into markets, but also their performance post-entry. Empirical studies on new ventures have established that sufficiency and size of initial capital resources boost the ability of new firms to survive (Bruderl et al., 1992), earn higher profits (Duchesneau and Gartner, 1990) and grow (Bamford et al., 1999).

Koch (1974) stated that "… there may exist capital requirements that discourage entry of new firms", positioning financing requirements as a potential entry barrier. In a review of studies in the economics literature on the determinants of firm entry, Geroski (1995) arrived at a stylised result that capital-raising requirements are important barriers to entry. Capital requirements act as entry barriers because entrepreneurs are usually liquidity constrained, as found by Evans and Jovanovic (1989). The resources required to form a new firm are usually beyond the means of individual entrepreneurs (Bhave, 1994). Entrepreneurs therefore look to external sources of financing to overcome the entry barrier of capital requirement.

2.1.1 Financial Munificence

In the theoretical literature, the contribution of external financing sources to firm creation has been examined by researchers adopting a resource dependence view of organisations. Resource dependence theory proposes that organisations are dependent on the environment for external resources and information. The degree to which such resources are abundant or scarce is described as environmental munificence (Castrogiovanni, 1991). By conceptualising how resources within an environment influence the survival and growth of incumbent firms, Randolph and Dess (1984) suggested that environmental resources also affect the ability of new firms to enter that environment. In her proposed model of environmental factors explaining firm formation rates, Specht (1993) delineated five categories of munificence, including economic munificence. The theoretical work of researchers in the fields of organisational ecology (Aldrich, 1990) and organisational theory (Gartner, 1985) has also identified financial sources as determinants of firm formation. These conceptual postulations were empirically supported by Pennings' (1980, 1982a, 1982b) studies of

organisation birth rates that found that areas with greater availability of financial resources exhibited higher frequencies of organisational formation.

These findings suggest that the availability of suitable financing sources would lower the barrier of capital requirement and facilitate entry into markets and industries, hence increasing the level of entrepreneurship In the literature, several alternative sources of external funding for new and small businesses have been analysed, most often in the context of the financing life cycles of firms (Scholtens, 1999, Carey et al., 1993). While insider funding is generally thought to be the main source of financing in the earliest stage of venture formation, funding sources such as banks, venture capitalists and informal investors are believed to play important roles during the start-up and expansion stages.

2.1.2 Debt Financing by Banks and Financial Institutions

Research on debt financing of new firms has been hampered by difficulty in obtaining data on funds raised by new firms from banks and other financial institutions. While certain regulated institutions such as commercial banks maintain records of loans to businesses, such data are typically not broken down by the size or age of the borrower. This situation has changed in the more advanced countries in recent years, in particular in the US, with the Survey of Terms of Bank Lending (STBL), bank call reports (CALL) and the Community Reinvestment Act (CRA) providing data to researchers.

Drawing on data from the US National Survey of Small Business Finances, Berger and Udell (1998) described the financing structure of "infant" businesses (aged below 2 years) in USA as comprising 47.9% equity financing, of which the bulk is internal finance, and 52.1% debt financing, of which 27.8% was funding from financial institutions. Next to internal equity, loans from commercial banks formed the single largest source of financing for new and young firms in the USA. Unfortunately, the paucity of equivalent data outside the USA, particularly in developing nations, has meant that the applicability of this conclusion to other countries cannot be verified.

In the context of new ventures, entrepreneurs may be driven to seek alternatives to financial institutions because the nature of new ventures presents difficulties for entrepreneurs to obtain financing from traditional bank and debt financing. As new firms lack tangible assets that may be pledged as collateral, banks financing might not be available to them (Berger and Udell, 2004). Empirical work by Brewer and Genay (1994) has shown that external private debt is more likely to be used to finance tangible assets, while venture capital finance is more likely to be used to finance intangible assets, such as those that would be owned by new firms.

Entrepreneurs may also lack track record and the ability to signal their abilities and potential to potential financiers. Information asymmetries between the entrepreneur and financial institutions give rise to adverse selection and moral hazard problems that necessitate monitoring costs to be incurred by the financial institutions (Diamond, 1991; Repullo and Suarez, 2000).

2.1.3 Venture Capital

One notable feature of the financing of new ventures has been the increasing role of Venture Capital (VC), particularly in the US and in Europe. Looking at data from the European Private Equity and Venture Capital Association (EVCA), Keuschnigg and Nielsen (2003) found that total VC funds and investments had gone up significantly since the 1990s. The increasing role of VCs in USA was illustrated by Gompers and Lerner (2001) through the growing share of VC-backed firms in IPOs.

VC investments have received substantive treatment in the literature, as surveyed by Gompers and Lerner (1999, 2001) and Kaplan and Stromberg (2001). From early on, Venture Capital availability was proposed and recognised as contributing to firm formation, as determined by Bruno and Tyebjee (1982) in a review of 17 papers on environmental factors influencing venture creation. VC firms are seen as having an edge over banks as a source of finance for new firms, especially specialised technology-based firms. VC firms are active investors with entrepreneurial experience and industry knowledge that both entrepreneurs and banks may lack. They are able to participate actively and contribute to the management of portfolio companies, bringing with them not only capital, but also expertise and access to networks and markets. Compared to banks, VCs are able to finance new ventures with higher risks, as they offer hands-on business advice to enhance survival rates of their portfolio companies.

However, VC funds typically incur high transaction costs. Gifford (1997) shows that this restricts the number of portfolio companies that VC firms can optimally evaluate, invest in and monitor. The minimum invested sum is corresponding high and beyond the reach of many smaller start-ups (BVCA, 2003 and Sohl, 1999 show figures for average size of VC investments in the UK and USA). Therefore, the number of businesses that can be funded by VCs is limited.

As several studies have estimated, total formal venture capital investment is only a fraction of total informal investment (Harrison and Mason, 1992; Reynolds et. al., 2002). It is a received consensus in the literature that most entrepreneurs use informal sources of funding, especially from family members (Zimmer and Aldrich, 1987). Amongst new firms that raised external equity capital, most raised it from angel investors as opposed to institutional Venture Capitalists (Fenn and Liang, 1998). In a study looking specifically at Business Angels (excluding the family and friends components of informal investments), Mason and Harrison (2000) estimated total angel investment to equal the amount of institutional VC funding in the UK. However, eight times as many businesses raise funds from business angels compared to VC firms.

2.1.4 Business Angel Investments

Business Angel investments, and the broader class of Informal investments, have received significant attention in the literature in the wake of Wetzel's (1982, 1983) groundbreaking studies of business angels in the US. Since those pioneering works, the importance of angel investment as a source of finance for new business ventures has become well-established in the entrepreneurship literature (Robinson and Onasbrugge, 2000; Mason and Harrison, 2000; Harrison and Mason, 1999). Business angel investments fill the financing gap between family and friends and the stage at which VC funds becomes a viable option for the new firm. Business angels are also

likely to have entrepreneurial experience and are able to contribute to the firms they invest in.

Two studies using GEM data have found that informal investment contributes to the level of entrepreneurial activity in countries. Bygrave et al. (2002) found that annual informal investment as a percentage of GDP contributes significantly to explaining the rate of opportunity-driven entrepreneurial activity across different countries. Using the percentage of adults who have made informal investments as the measure of informal investment intensity, Autio et al. (2003) found that informal investments had significant positive impact on opportunity-driven entrepreneurship as well as entrepreneurial activities with high growth potential.

2.1.5 Deciding between Different Financing Choices

There are two broad theoretical principles underlying the financing choices of businesses, taking into account both explicit and implicit costs of finance. The static trade-off choice framework describes several factors, including costs of exposure to bankruptcy (Harris and Raviv, 1991) and agency costs associated with the use of debt financing (Myers, 1977). In the pecking-order theory of capital structure choice, Myers and Majluf (1984) posit that risks associated with information asymmetries between the firm and potential financiers will result in different expected return rates by financiers and a pecking order of external financing sources preferred by the firm.

Cassar (2004) pointed out that several aspects of the financing choices are unique to start-ups and new ventures. Their newness and smaller scale would make some financing options unavailable and they are also more likely to be subject to context and individual-specific issues. Entrepreneurial ventures are also informationally opaque due to their limited track-record and are therefore likely to be more heavily reliant on initial insider finance (Berger and Udell, 1998). As such, in studying the financing options of start-ups, many factors other than the direct cost of funds may influence the financing decisions of both financier and entrepreneur. Furthermore, for the purposes of empirical research, it is difficult to obtain cross-sectional data on interest rates levied on small enterprises or new ventures. The complexities of the financing choice decision for start-ups indicate that the effect of different funding sources on entrepreneurial propensity is not uniform. A deeper understanding of the role of financing in venture formation would involve distinguishing and comparing different forms of funding.

2.2 Regulatory Business Costs as Entry Barriers to Entrepreneurship

The literature on industrial organisation and strategic management has established that a number of factors can deter potential new ventures from being formed despite the existence of market opportunities (see Gilbert (1989) for a survey). Empirical studies such as those by Harrigan (1981) and Dean and Meyer (1996) found that high entry barriers deter new venture entry. As reviewed by Siegfriend and Evans (1994), the use of multiple approaches and measures of entry barriers in prior empirical studies has led to some disagreement on which types of entry barriers are the strongest deterrent. Nevertheless, there is consensus that the extent of entry barriers will relate negatively to the extent of new firm formation. Gilbert (1989) explains that barriers to entry grant incumbent firms an asymmetrical advantage in serving a market and this can act to

exclude new entrants. An earlier study by Gorecki (1975) showed that this incumbent advantage has greater impact on new firm formations than on diversifying firms.

The issue of regulatory entry barriers has received relatively limited treatment in the empirical literature on firm formation rates, with most attention given to entry barriers such as product differentiation, capital requirements and economies of scale, as reviewed by Robinson and McDougall (2001). However, regulation of entry is recognised as a barrier to entry. Porter (1980) proposed that government regulation may impose entry barriers to potential new ventures. Karakaya and Stahl (1989) listed a number of studies, primarily in the economics literature, that have considered government regulations as barriers to entry. Regulatory and procedural requirements entail business costs to be incurred by entrepreneurs, in terms of financial outlay and/or time consumed. Prohibitive costs may deter potential entrepreneurs (Japan Association of Small Business, 1999) or drive them into the informal economy (Djankov et al., 2002), hampering their ability to grow and contribute to economic growth due to lack of proper access to social, legal and business infrastructures.

Cross-country analysis of the link between regulatory business costs and entrepreneurship has been hampered in the past by lack of a consistent measure for business cost. Djankov et al. (2002), following the work of de Soto (1990) developed a methodology to construct internationally comparable measures on the regulatory cost of starting a business. Using this methodology, the World Bank has constructed the Doing Business Database with business cost data from 145 economies.

Four measures are used by the World Bank (2004) to capture various aspects of the registration process for new ventures in a country, measuring the cost of a starting a business. The four measures are: the number of procedures involved in the process, the number of days associated with the procedures, the official costs associated with the procedures and the minimum capital required before the registration process starts. The number of procedures describes the number of external parties, usually government-related, that the entrepreneur faces before his new business is registered. For many less developed economies, a higher number of procedures present greater opportunities for bribes to change hands, according to the tollbooth view of the public choice theory (McChesney, 1987 and De Soto, 1990).

The business cost indicators constructed by the World Bank apply to limited-liability companies, and not to sole proprietors, partnerships, cooperatives or corporations. It is argued that limited liability companies are the most prevalent business form and the most desirable for economic reasons. Limited liability companies are the most likely to attract investors because potential losses are limited to the invested capital.

The World Bank (2004) report provides descriptive analysis of the regulatory cost of starting a business globally and examines the socio-economic effects of high regulatory costs in terms of business growth, labour conditions, corruption and political rights of citizens. The World Bank did not attempt to correlate regulatory costs with the rate of firm formation. However, the report cited two countries, Austria and Vietnam, in which the rate of business creation increased after laws were passed to eliminate registration-related costs and procedures. In addition, the report found that richer countries have less burdensome regulatory costs while the OECD group of countries regulated the least compared to other regional groupings. Describing studies

by Betrand and Kramarz (2002) and Alesina et al. (2003), the report showed that high regulatory business cost had adverse impact on employment growth and private investments in several developed countries. These findings suggest that such business costs may have stemmed the formation of entrepreneurial firms, leading to weakened economic performance in these economies.

3. Research Questions and Hypotheses

In this paper, we investigate the influence of availability of financing sources and regulatory business costs on national level entrepreneurial propensity, across a panel of countries participating in the GEM 2002 study. To measure the national level of entrepreneurial propensity, we use the consistent and internationally comparable measures of entrepreneurship developed by GEM, the Total Entrepreneurship Activity (TEA) rates.

Specifically, we seek to establish if the availability of financing and business costs have different effects on three sub-types of TEA rates measuring different types of entrepreneurial activity: opportunity-driven, necessity driven and high-growth potential TEA. Opportunity and Necessity TEA rates differentiate between entrepreneurs that are motivated to pursue perceived business opportunities and those that are driven to become entrepreneurs as a last resort, when other options for economic activity are absent or unsatisfactory. High-potential Growth TEA rate identifies the sub-set of entrepreneurs that are involved in businesses that have "high growth potential".

Previous literature on the relationship between entry barriers, availability of financing and rates of firm formation has typically viewed entrepreneurship as opportunity-driven. Entrepreneurship is seen as arising from entrepreneurial opportunities which exist because of asymmetric beliefs about the value of resources (Kirzner, 1997). In attempting to construct an integrating framework for entrepreneurship, Shane and Venkataraman (2000) highlight the emphasis on opportunity in entrepreneurship research by defining entrepreneurship as an examination of opportunities to create future goods and services. By looking at necessity driven entrepreneurial propensity and contrasting its determinants with those of opportunity-driven entrepreneurship, we hope to gain insights into the role played by entrepreneurial opportunities in start-up and firm formation activities.

High-growth potential TEA is of particular interest because research has shown that not all new firms contribute equally to economic growth. Kirchhoff (1994), Storey (1994), Westhead and Cowling (1995) and Birch et al. (1997) maintain that it is rapidly growing firms, rather than small firms in general, that generate the vast majority of new jobs. Using cross-country GEM data, Wong et al. (2005a) demonstrated that High-growth potential TEA was the only type of entrepreneurial activity that significantly influenced economic growth rates. The task of identifying such high-growth potential firms is daunting because they typically represent less than 5% of new firms formed. The 2002 round of the GEM survey incorporated questions that could be used to identify individuals involved in high growth potential new ventures and start-up attempts. Rather than analysing firms that have already achieved high growth, Autio et al. (2003) explain that it is of greater interest to examine ex-ante firms that have the potential for growth. The ambitions and growth expectations of

entrepreneurs are a likely antecedent to achieving future high performance. The high-growth potential TEA rate is derived by operationalising these expectations along four characteristics: 1) potential for employment growth, 2) market impact, 3) globalised customer base and 4) use of new technology, where all four criteria must be fulfilled[1].

3.1 Availability of Financing Sources

Following the prediction of resource dependence theory that greater environmental munificence would lead to higher rates of firm formation (Castrogiovanni, 1991, Specht, 1993), we expect that the availability of external financing in an economy would be a significant determinant of entrepreneurial propensity. As earlier discussed, the empirical and theoretical literature reports mixed findings on the different forms on financing and their role in venture formation. While debt financing is a major source of funding, at least in the US, information asymmetries render it unavailable to many entrepreneurs who lack tangible assets or sufficient track record (Berger and Udell, 2004). On the other hand, the characteristics of new firms, such as low-scale potential, may limit the applicability of financing from venture capitalists, who have been found to invest large amounts in a small number of firms (BVCA, 2003; Sohl, 1999). In general, total VC investments tend to be only a fraction of the investments made by informal investors (Reynolds et al., 2002) and the venture capital industry is also undeveloped in many countries.

These prior findings indicate that the different forms of financing do not have a uniform impact on entrepreneurial propensity. The nature of new ventures as well as the characteristics of the funding sources might limit the impact of certain forms of financing. As such, to more accurately test the hypothesis on the impact of financial munificence, we have distinguished three common forms of financing – traditional debt financing, informal investment and venture capital.

H1a: Countries with higher availability of Informal Investors will exhibit higher levels of entrepreneurial propensity
H1b: Countries with higher availability of VC fund investments will exhibit higher levels of entrepreneurial propensity
H1c: Countries with higher availability of debt financing will exhibit higher levels of entrepreneurial propensity

We expect that certain forms of financing would have stronger effect on entrepreneurial propensity than others. However, previous empirical evidence is not conclusive on the relative magnitude of the influence exercised by specific financing sources. Many studies have focused on a single financing form, such as VC or informal investments, and did not compare across different types of financing. Furthermore, as critiqued by Cassar (2004), the majority of empirical investigations into financing of new firms have been on limited geographic and industry focus. By examining the relative size of the standardised estimated coefficients from our analysis, we will attempt to compare the relative contributions of three major financing sources to explaining venture formation rates.

3.2 Business Costs

We posit that business costs have significant negative impact on entrepreneurial propensity, but only for Opportunity Driven entrepreneurship. As argued by Dean and Meyer (1996), entry barriers act as constraints on exploitation of opportunities by new ventures in a framework where new ventures are driven by demand determinant. The exploitation of opportunities requires the entrepreneur to judge that expected entrepreneurial profits would more than compensate for opportunity costs of other alternatives (including loss of leisure and income security), lack of liquidity and a premium for bearing uncertainty (Shane and Venkataraman, 2000; Kirzner, 1973). Entry barriers such as regulatory business costs raise the required expected returns from entrepreneurial opportunities.

Necessity entrepreneurs, on the other hand, are driven to self employment by the absence of alternative employment, creating the "refugee" effect described by Audretsch (2001). While necessity entrepreneurs may well exploit opportunities, this is not the main motivation. Hence, the decision process of necessity entrepreneurs places less weight on assessing the expected value of entrepreneurial opportunities. Additionally, the opportunity cost of alternative employment and income is zero for necessity entrepreneurs, except in the case of countries with social security safety-nets, which we will address in the next hypothesis. When entrepreneurial activity is a last resort due to lack of alternative means of earnings, we would expect that business cost would have no deterrent effect.

H2a: Countries with higher regulatory business costs will exhibit lower levels of Opportunity driven entrepreneurial propensity

H2b: Regulatory business costs will not significantly differentiate between countries with high and low levels of Necessity-driven entrepreneurial propensity

When categorising entrepreneurship as opportunity versus necessity driven, we have implicitly viewed entrepreneurship in the context of occupational choice or preference (Shmitz, 1989), with necessity entrepreneurship representing an extreme of zero choice. When examining the issue of entry barriers, it is important to also consider the effect of national income level as this dictates the opportunity costs of alternatives to entrepreneurship and influences the employment versus entrepreneurship decision. In wealthier countries, the opportunity cost of lost employment is higher as income levels for paid employment are higher. Additionally, in many wealthier countries, social security systems are in place to provide safety-nets for the unemployed. In the presence of high opportunity costs, the existence of entry barriers in such countries would have a stronger deterrent effect on potential entrepreneurs, both opportunity and necessity-driven. Conversely, in low income nations where jobs are scarce and social security systems are inadequate, the opportunity costs are low and entry barriers will have weaker or no effect on entrepreneurial propensity. We posit, therefore, that the deterrent effect of regulatory business costs on both Opportunity and Necessity TEA rates depends on the wealth level of the nation.

H3a: The impact of regulatory business cost on Opportunity driven entrepreneurial propensity will be more negative in higher income countries.

H3b: The impact of regulatory business cost on Necessity driven entrepreneurial propensity will be more negative in higher income countries.

The degree to which business costs would deter the formation of new businesses is inversely related to the expected value of entrepreneurial opportunities. Research has shown that entrepreneurs are more likely to exploit opportunities with higher returns such as when profit margins are higher (Dunne et al., 1988) or when the technology life cycle is young (Utterback, 1994). The greater the expected value of entrepreneurial opportunities, the lower would be the deterrent effect of entry barriers, as returns are expected to more than compensate the costs imposed by these barriers. For activities which are driven by entrepreneurial opportunities with very high expected values, we would expect that regulatory business cost would not have any deterrent effect. In our present analysis, High-growth Potential TEA captures this element of entrepreneurial opportunities with high expected values. Therefore, we posit that business costs would have no significant impact on high-growth potential entrepreneurial propensity across countries.

H4: Regulatory business costs will not significantly differentiate between countries with high and low levels of High Growth Potential entrepreneurial propensity

4. Methodology

These hypotheses are tested using multiple linear regression on a sample of countries that participated in the GEM 2002 study. In total, there are 37 countries in the sample. However, due to missing data in certain countries for VC investments and Business Cost, the effective sample size for a few regression estimations is 29 countries.

4.1 Data Sources

The main data source used for analysis is the harmonised country-level GEM 2002 dataset. This comprises entrepreneurship propensity data on 37 countries, aggregated from large-sample adult population surveys in participating countries. The list of 37 countries is given in Appendix Table A1. Additionally, the GEM project also included face-to-face interviews with around 35 expert informants in each country. These expert informants completed a short standardised questionnaire in which they assessed the environment for entrepreneurship in their respective countries, along nine dimensions as specified in the GEM conceptual model. These assessments are also summarised in the country-level dataset. Reynolds et al. (2005) provides a detailed explanation of the GEM design and implementation process for data collection.

Data on Venture Capital investments are collated by the co-ordinators of GEM from various national sources such as the Australian Venture Capital Journal, British Venture Capital Association, Canadian Venture Capital Association, European Venture Capital Association and the National Venture Capital Association (US). Participating GEM countries submitted Venture Capital data from national sources, where available, to the GEM coordinators.

Data on Business Cost are obtained from the World Bank Doing Business Database (World Bank, 2004), constructed using the methodology developed by Djankov et al. (2002). The World Bank database provides details on four measures of regulatory

business costs for starting new businesses: number of procedures to start a business, number of days to start a business, cost of starting a business and minimum paid up capital required to register a business. The monetary cost measures are standardised as percentages of per capita income in order to be comparable across countries.

4.2 Estimation Model

The model used for hypothesis testing is a regression equation of the general form:

National Entrepreneurial Propensity = f (control variables … Availability of Debt Finance, Availability of Informal Investment, Availability of Venture Capital, Regulatory Business Cost)

Below, we describe the measures and data source for each of the variables in the model. The correlation coefficients between the variables are presented in Appendix A2.

National Entrepreneurial Propensity is the dependent variable and is measured using the TEA rates computed from the GEM 2002 dataset. High Potential TEA, Necessity TEA, Opportunity TEA and overall TEA rates are alternated as the measures of entrepreneurship used in the dependent variable. TEA rates for 2002 are used because of the larger number of cases, 37, and because that is the first year for which data were collected to compute the High Potential TEA index.

There are two control variables used to control for different economic conditions in the cross section of GEM countries. As the number of observations is limited, we have been parsimonious in our choice of control variables. Additional variables, such as ratio of R&D expenditure to GDP and trade to GDP ratio, were also tested and excluded as they were not statistically significant.

Rate of Productivity Growth controls for different stage of economic development.[2] This is measured using the growth in GDP per employed person over a 5-year period. Growth rate is computed by taking the average of annual compound growth rates between 1997/98 and 2001/02. Average growth over a 5-year period is used to smooth out temporal fluctuations in annual growth rates. GDP data are obtained from the World Economic Outlook by the International Monetary Fund (IMF). Data on employed persons are from Euromonitor Global Market Information Database (GMID), compiled from national sources.

GDP per employed person controls for different wealth levels in the sample of countries. GDP per employed person for the year 2002 is used and data are obtained from the World Economic Outlook by the International Monetary Fund (IMF) and the Euromonitor Global Market Information Database (GMID), compiled from national sources.

There are three independent variables related to the availability of different sources of financing for new firms:

Availability of Debt Finance is measured using the GEM expert informants' assessment of whether "there is enough debt funding for new and growing firms" in each country. This is rated on a scale of 1 to 5, where 1 equals "strongly disagree" and 5 equals "strongly agree". The responses from all expert informants in a country are aggregated and averaged. The average score in each country serves as a proxy of debt financing availability in the country.

Availability of Informal Investors is measured as the proportion of the adult population in the country who had in the past 3 years personally provided funds for a new business started by someone else, excluding the purchase of publicly traded shares or mutual funds. Data on informal investors are obtained from the GEM 2002 database.

Availability of Venture Capital is measured as the dollar value of domestic institutional VC investments as a percentage of GDP in 2002. Data for this are collated by GEM, using VC data compiled by national sources in each country.

We acknowledge that the inconsistent measurement of the three funding sources is a shortcoming of the dataset. While it would have been preferable to measure availability of debt funding in terms of total value of loans to new ventures, such data are unavailable for most countries.

The other independent variable is Regulatory Business Cost, as measured by regulation of the registration process for new businesses:

Regulatory Business Cost is measured using a composite index of the four World Bank (2004) measures of government imposed business costs associated with starting a business: number of procedures to start a business, number of days to start a business, cost of starting a business and minimum paid up capital required to register a business. The index is constructed by firstly standardising the individual measures to have a mean of 0 and a standard deviation of 1. The composite Business Cost index is computed as the equal-weighted average of these 4 standardised measures.

Regulatory Business Cost data from the World Bank Doing Business database are benchmarked to the year 2004. While it would have been ideal to use business cost data for the year 2002 to be consistent with other variables, this was not possible as World Bank had not collected such data for prior years. Djankov et al. (2003) had collected data on number, cost and length of procedures for the year 2002 but data on minimum capital requirement are not available across all countries for this earlier period. In the interest of having a more complete measure of regulatory business cost, we have used the 2004 data from the World Bank, where minimum capital requirement is included. However, we envisage that this incongruence in the period of measurement would have little impact on the findings as regulatory procedures and costs for registrations are not expected to vary much within 2 years.

4.3 Analysis

Because data on VC investments are only available for 30 countries, the degrees of freedom for regression analysis are restricted. Additionally, three countries did not

have expert informant data on availability of debt financing, reducing the effective sample size to 28 countries, if all variables are included. As such, we have estimated the regression equation in two stages. In the first stage, we include the three alternative sources of finance to determine their levels of significance as determinants of entrepreneurship propensity.

$$TEA = \alpha + \beta_1 \text{ } Productivity \text{ } Growth + \beta_2 \text{ } GDP/worker + \beta_3 \text{ } Availability \text{ } of \text{ } Informal \text{ } Investors + \beta_4 \text{ } VC/GDP + \text{ } \beta_5 \text{ } Availaibity \text{ } of \text{ } Debt \text{ } Financing$$

In the second stage, we add the World Bank Business Cost index as an independent variable, together with the variables on financing sources which were found to be significant in the first stage. The interaction term, *Regulatory Business Cost * GDP/worker*, is included to assess if the impact of business cost on entrepreneurial propensity is contingent on the income level of the country[3]. The unmodified interaction term resulted in high multicollinearity between the interaction term and its component variables. To eliminate this problem, the GDP/worker construct was centred to mean before the interaction term was computed.

$$TEA = \alpha + \beta_1 \text{ } Productivity \text{ } Growth + \beta_2 \text{ } GDP/worker + \beta_3 \text{ } (Significant \text{ } Finance \text{ } Variable(s)) + \beta_4 \text{ } Regulatory \text{ } Business \text{ } Cost + \beta_5 \text{ } (Regulatory \text{ } Business \text{ } Cost * GDP/worker)$$

In all regression equations estimated, multicollinearity diagnostics are generated to detect for potential problems. All reported results do not exhibit significant multicollinearity between predictors.

5. Results

The equation constructed for hypothesis testing is estimated using linear least squares regression, alternating four different TEA indices as the dependent variable. While we show the results for Overall TEA for completeness, it is noted that this is a composite of Opportunity and Necessity TEA rates. As these two TEA indices yield very different results when analysed individually, it is difficult to directly interpret the results for Overall TEA.

The signs and significance of the control variables are as expected. GDP per worker is significant and negative for Opportunity TEA and Necessity TEA. This is consistent with the fact that there are more entrepreneurial opportunities in developing countries as well as higher levels of unemployment leading to the "refugee" effect of necessity entrepreneurship. In contrast, GDP per worker is positive but insignificant for High-growth Potential TEA, suggesting that the prevalence of high-growth entrepreneurial opportunities is not dependent on national wealth. The growth in GDP per worker is significant and negative only for Necessity TEA. This is expected as necessity-driven entrepreneurs tend to possess fewer endowments of human capital and entrepreneurial capability, as argued by Lucas (1978), and are less likely to sustain new business venture that will contribute to growth.

5.1 Availability of Financing Sources

The results for comparing the impact of three different sources of financing are presented in Table 1 below. The sample size for this first regression is 28 countries. Standardised coefficients are reported in order to compare the relative contribution of each predictor to explaining the dependent variable. The findings support only Hypothesis *H1a* that the prevalence of informal investors would lead to greater entrepreneurial propensity. This was found to be positive and significant for all types of TEA except for necessity TEA. Institutional VC investment and Availability of Debt Financing were both found to be insignificant for all types of entrepreneurship.

(Insert Table 1 here)

Because the constructs for the three financing sources are measured on different scales, we proceed with caution to compare the standardised coefficients on these three predictors. We observe that the estimated standardised coefficient value on the Informal Investor predictor is consistently higher that the values for both the VC and Debt Financing predictor. In the case of Opportunity TEA, the coefficient on VC is marginally lower than that for Debt Financing, but both were statistically insignificant. Keeping the measurement *caveat* in mind, these findings suggest that the availability of Informal Investors is a stronger influence on entrepreneurial propensity than the other two funding sources. This appears consistent with evidence from previous studies, estimating that total informal capital investment is multiple times that of formal venture capital (Harrison and Mason, 1992; Reynolds et. al., 2002) and that informal capital funds a greater number of new firms than formal venture capital (Mason and Harrison, 2000). Studies also show that formal sources of funding such as banks and VC firms are not as important in explaining firm formation rates (Hart and Denison, 1987).

5.2 Regulatory Business Costs

In the second stage of the regression analysis, we include the World Bank composite index of regulatory business cost as an independent variable, retaining only the financing variable, namely Informal Investors that was found to be significant in the first stage. Omitting both the VC and Debt Financing variables, for which data were missing in several countries, the sample size for this regression is increased to 36 countries. The results are shown in Table 2 below.

(Insert Table 2 here)

As postulated in Hypotheses *H3a*, regulatory business cost has a negative and significant impact on Opportunity TEA. As expected, Regulatory Business Cost had no significant deterrent effect on necessity-driven entrepreneurship, supporting Hypothesis *H2b*.

We found the interaction term *Regulatory Business Cost * GDP/ worker* to be significant and negative for both Opportunity and Necessity TEA. This confirms Hypotheses *H3a* and *H3b*. The negative impact of regulatory cost is more pronounced in higher income nations. In the case of Opportunity TEA, this means that the

deterrent effect of regulatory business cost is augmented in higher income nations, as the Business Cost variable in itself was significant and negative. In the case of Necessity TEA, the significance of the interaction term, while the Business Cost term itself was not significant, suggests that regulatory business costs only affects the rate of necessity entrepreneurship in higher income countries.

Finally, the coefficient on Regulatory Business Cost is negative but insignificant for High-growth Potential TEA. This suggests that High-growth Potential TEA arises through the exploitation of opportunities that have sufficiently high expected value to negate the deterrent effects of regulatory business costs.

6. Discussion and Conclusion

In general, the findings support the importance of financial munificence to new venture formation, but of three major forms of financing tested, only Informal Investment Availability contributes significantly to entrepreneurial propensity. Informal Investment Availability is particularly important as a determinant of High Growth Potential and Opportunity entrepreneurship. Conversely availability of debt financing and classic VC were found to be insignificant for these two types of entrepreneurship. As several studies that have estimated that total informal capital investment is multiple times that of formal venture capital (Harrison and Mason, 1992; Reynolds et. al., 2002), this finding confirms the importance of informal investment relative to other forms of financing.

While VC investment was found to not significantly explain national level entrepreneurial propensity, this does not undermine the importance of VC investment in funding new ventures. VC investments are relatively small in number and are typically concentrated in selective high-technology industries, especially the IT sector, where the role of VC is particularly crucial. While the impact of VC on general levels of entrepreneurship is negligible, it is possible that this would not be the case when conducting industry-specific analysis.

The insignificance of the Debt Financing predictor appears to support the theoretical literature that information asymmetries present moral hazard and adverse selection problems, limiting the access of entrepreneurs to financing from financial institutions. However, this finding should be interpreted with caution due to the perception-based construct for the availability of debt financing.

Regulatory business cost was found to have a deterrent effect on entrepreneurial activities that are Opportunity-driven. In contrast, regulatory business cost was found to have no impact on the Necessity-driven entrepreneurial propensity. This is consistent with the view of entry barriers as deterrents that negate entrepreneurship driven by "pull" or "demand" factors characterised by market opportunities (Porter, 1987; Dean and Meyers, 1996). Additionally, we found that the impact of business cost is dependent on the income level of countries. Specifically, in more developed countries, regulatory business cost has a more pronounced negative effect on Opportunity driven entrepreneurial propensity and becomes a deterrent even for Necessity-driven entrepreneurship.

As High-Growth Potential and Opportunity entrepreneurship are the most desirable forms of entrepreneurial activities, these findings underline the importance of encouraging business angel investment and reforming regulations for business entry. Maula et al. (2005) and Wong et al. (2005b) have found that the propensity to make informal or angel investments increases significantly if individuals are themselves entrepreneurs or personally know other entrepreneurs. This serves to underscore the importance of supporting widespread grass-root participation in entrepreneurial start-up attempts.

Entry barriers erected by regulatory business costs significantly impede the formation of new ventures, more so in developed nations than lower income countries. The World Bank (2004) has emphasized the need for administrative and regulatory reforms, particularly focusing on developing economies. Our findings suggest that there is also a need to reduce regulatory costs in advanced countries, where the deterrent effects of such costs appears to be more strongly felt. Several higher income countries in our sample have relatively high capital requirements. Japan requires minimum capital that is 75% of GDP per capita, while Denmark and Germany have requirements that are close to 50% of GDP per capita. It is suggested that comprehensive reform of regulatory costs would eliminate this minimum capital requirement to have zero requirement, as already practised in the US, UK, Hong Kong, Canada and Singapore, amongst others.

The prevalence of High-growth Potential entrepreneurial activity is not affected by the presence of regulatory business costs. This suggests that High-growth potential entrepreneurship arises from exploitation of entrepreneurial opportunities with very high expected values. Supply constraints such as business costs have no effect on this type of entrepreneurial activity. While our analysis has been limited to one form of supply constraint, and has not explored supply-side barriers such as bankruptcy legislation and compliance costs, this does present some preliminary evidence that High-growth potential TEA is truly opportunity-driven and supports the public policy focus in many developed countries to promote technology and knowledge-based entrepreneurship that exhibit high growth and high job creation rates (Shreyer, 2000; OECD, 1998).

---

[1] The full definition of a high-potential innovative start-up attempt in the GEM dataset is a venture that fulfils all of the following criteria: (1) the venture plans to employ at least 20 employees in 5 years; (2) the venture indicates at least some market creation impact; (3) at least 25% of the customers of the venture normally live abroad; and (4) the technologies employed by the venture had not been widely available more than a year ago.

[2] We also used growth in GDP per capita as an indicator of economic growth. The results were found to be largely similar.

[3] In the interest of completeness, we also included an interaction term *Informal Investment * GDP/ worker*. This was found to be not significant and its inclusion did not significantly alter the results of the analysis.

References

Acs, Z. & Audretsch D., 1989, "Small firm entry in US manufacturing", *Economica*, 56: 255-266.

Aldrich, H., 1990, "Using an ecological perspective to study organizational founding rates", *Entrepreneurship Theory and Practice*, Spring: 7-24.

Alesina, Alberto, Silvia Ardagna, Guiseppe Nicoletti, and Fabio Schiantarelli, 2003, "Regulation and Investment." Working Paper 9560. National Bureau of Economic Research, Cambridge, Mass.

Autio, E., Wong, P.K. and Reynolds, P.D., 2003, "National Factors Influencing the Prevalence of "High-Potential" Start-Ups." NUS Entrepreneurship Centre Research Working Paper

Bain, J. S., 1956, *Barriers to New Competition*. Cambridge. MA: Harvard University Press.

Bates, T., 1995, "Self employment entry across industry groups", *Journal of Business Venturing*, 10: 143-157.

Bamford, C.E., Dean, T.J. and McDougall P.P., 1999, "An examination of the impact of initial founding conditions and decisions upon the performance of new bank start-ups." *Journal of Business Venturing* 15: 253– 277.

Berger, A.N. and Udell, G.F., 1998, "The economics of small business finance: the roles of private equity and debt markets in the financial growth cycle", *Journal of Banking and Finance*, 22: 613-673.

Bertrand,Marianne, and Francis Kramarz, 2002, "Does Entry Regulation Hinder Job Creation? Evidence from the French Retail Industry." *Quarterly Journal of Economics* 117(4): 1369–1413.

Bhave, M.P. , 1994, "A process model of entrepreneurial venture creation", *Journal of Business Venturing* 9:223–242.

Birch, David, Anne Haggerty and William Parsons, 1997, *Who's Creating Jobs?* Cambridge, MA, Cognetics.

Bruderl, J. Preisenorfer, P. & Ziegler, R., 1992, "The survival chances of newly founded business organizations", *American Sociological Review,* 57: 227-242.

Bruno, A.V. and Tyebjee, T.T., 1982, "The environment for entrepreneurship", In C.A. Kent, D.L. Sexton and K.H. Vesper (eds) *Encyclopedia of entrepreneurship*, 283-307. Englewood Cliffs, NJ: Prentice-Hall.

BVCA, 2003, *Report on Investment Activity*. London: British Venture Capital Association

Bygrave, W.D., Hay, M., Ng, E. And Reynolds, P., 2002, "A Study of investing in 29 nations composing the Global Entrepreneurship Monitor", presented at the Babson-Kauffman Entrepreneurship Research Conference, June 2002.

Carey, M., Prowse, S., Rea, J., Udell, G.F., 1993. "The economics of private placements: A new look", *Financial Market Institutions and Instruments,* 2: 1-67

Cassar, G., 2004, "The financing of business start-ups", *Journal of Business Venturing*, 19: 261-283.

Castrogiovanni. G. J., 1991, "Environmental munificence: A theoretical assessment", *Academy of Management Review*, 16(3): 542-565.

De Soto, Hernando, 1990, *The Other Path,* New York, NY: Harper and Row.

Dean, T.J. and Meyer, G.D., 1996, "Industry Environments And New Venture Formations In U.S. Manufacturing: A Conceptual And Empirical Analysis Of Demand Determinants." *Journal of Business Venturing* 11:107-132.

Diamond, D.W., 1991. "Monitoring and reputation: The choice between bank loans and directly placed debt", *Journal of Political Economy,* 99: 688–721.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2002, "The Regulation of Entry". *Quarterly Journal of Economics*, 117: 1-37.

Duchesneau, D.A. and Gartner, W.B., 1990, "A profile of new venture success and failure in an emerging industry", *Journal of Business Venturing* 5:297–312.

Dunne, T., Roberts, M., & Samuelson, L., 1988, "Patterns of firm entry and exit in U.S. manufacturing industries", *Rand Journal of Economics*, 19: 495-515.

Evans, D. S. and B. Jovanovic, 1989, "An Estimated Model of Entrepreneurial Choice Under Liquidity Constraints." *Journal of Political Economy* 97: 808-27.

Evans, D.S. and L.S. Leighton, 1989, "Some Empirical Aspects of Entrepreneurship." *American Economic Review* 79(3):519-533.

Fenn, G.W. and Liang, N., 1998, "New resources and new ideas: Private equity for small businesses", *Journal of Banking and Finance* 22: 1077-1084.

Gartner, W., 1985, "A conceptual framework for describing the phenomenon of new venture creation", *Academy of Management Review*, 10: 696-706.

Geroski, P., 1995, "What do we know about entry?" *International Journal of Industrial Organization*, 13: 421-440.

Gifford, S., 1997, "Limited Attention and the Role of the Venture Capitalist," *Journal of Business Venturing* 12: 459-482.

Gilbert, R.J., 1989, "Mobility barriers and the value of incumbency." In R. Schmalensee, ed., *Handbook of Industrial Organization.* New York: North-Holland.

Gompers, P.A. and Lerner, J., 1999, *The Venture Capital Cycle*, Cambridge: MIT Press.

Gompers, P.A. and Lerner, J., 2001, "The Venture Capital Revolution," *Journal of Economic Perspectives* 15: 145-168.

Gorecki P.K., 1975, "The determinants of entry by new and diversifying enterprises in the U.K. manufacturing sector 1958–1963: some tentative results." *Applied Economics* 7: 139–147.

Harrigan K.R., 1981, "Barriers to entry and competitive strategies." *Strategic Management Journal* 2(4): 395–412.

Harrison, R.T. & C.M. Mason., 1992, "International Perspectives on the Supply of Informal Venture Capital," *Journal of Business Venturing* 7(6): 459– 475.

Harrison, R.T. and Mason, C.M., 1999, "An overview of Informal Venture Capital Research," *Venture Capital: An International Journal of Entrepreneurial Finance,* 1: 95-100.

Hart, S., & Denison, D. R., 1987, "Creating new technology-based organizations: A system dynamics model", *Policy Studies Review* 6(3): 512-528.

Holtz-Eakin, D., D. Joulfain, and H. S. Rosen, 1994, "Sticking It Out: Entrepreneurial Survival and Liquidity Constraints," *Journal of Political Economy* 102: 53-75.

Huskey, E., 2005, "Lowering the Barriers for Entry for Russian Small Business: Has the 2001 Law on the Registration of Juridical Persons Made a Difference?" Paper presented at the International Conference on "Commercial Law Reform in Russia and Eurasia" 8-9 April 2005, Washington DC.

Japanese Association of Small Business, 1999, C*onstraints to Business Entry*. Tokyo.

Kaplan, S.N. and Stromberg, P., 2001, "Venture Capitalists as Principals: Contracting, Screening, and Monitoring." *American Economic Review* 91: 426-430.

Karakaya, F. & Stahl, M. J., 1989, "Barriers to entry and market entry decisions in consumer and industrial goods markets", *Journal of Marketing*, 53: 80-91.

Keuschnigg, C. and Nielsen, S.B., 2003, "Taxation and Venture Capital Backed Entrepreneurship," Discussion paper no. 2003-17 University of St. Gallen Department of Economics

Kirchhoff, B., 1994, *Entrepreneurship and Dynamic Capitalism*. Westport, CT, Praeger.

Kirzner, I., 1973, *Competition and entrepreneurship*. Chicago: University of Chicago Press.

Kirzner, I., 1997, "Entrepreneurial discovery and the competitive market process: An Austrian approach", *Journal of Economic Literature*, 35: 60-85.

Koch, J. V. 1974, *Industrial Organization and Prices*. Prentice-Hall: Englewood Cliffs, NJ.

Lucas, Robert E., 1978, 'On the Size Distribution of Business Firms', *Bell Journal of Economics* **9:** 508-523.

Mason, C.M. and Harrison, R.T., 2000, "The Size of the Informal Venture Capital Market in the United Kingdom," *Small Business Economics*, 15:137-148.

Maula, M., Autio, E. and Arenius, P., 2005, "What Drives Micro-Angel Investments? An Examination of the Determinants of Family and Nonfamily Investments." *Small Business Economics* (upcoming).

McChesney, Fred S., 1987, "Rent Extraction and Rent Creation in the Economic Theory of Regulation," *Journal of Legal Studies,* 16: 101-118.

Myers, S.C. and Majluf, N.S., 1984, "Corporate financing and investment decisions when firms have information that investors do not have", *Journal of Financial Economics*, 13(2): 187-221.

OECD, 1998, *Technology, Productivity and Job Creation - Best Policy Practices 1998 Edition*. Paris: OECD.

Pennings, J. M., 1980, "Environmental influences on the creation process", In J. Kimberly, R. Miles, & Associates (Eds.), *The organizational life cycle*, 135-160. San Francisco: Jossey-Bass.

Pennings, J. M., 1982a, "Organizational birth frequencies: An empirical investigation", *Administrative Science Quarterly*, 27: 120-144.

Pennings, J. M., 1982b, "The urban quality of life and entrepreneurship", *Academy of Management Journal* 25(1): 63-79.

Porter, M.E. 1980, *Competitive Advantage.* New York: Basic Books.

Porter M.E., 1987, "From competitive advantage to corporate strategy." *Harvard Business Review* 65(3): 43–59.

Repullo, R. and Suarez, J., 2000, "Entrepreneurial moral hazard and bank monitoring: A model of the credit channel", *European Economic Review,* 44: 1931-50.

Randolph, W.A. and Dess, G.G., 1984, "The congruence perspective of organisation design: A conceptual model and multivariate research approach", *Academy of Management Review* 9: 114-127.

Reynolds, P.D., Hay, M., Bygrave, W.D., Camp, S.M. and Autio, E., 2000, *Global Entrepreneurship Monitor: 2000 Executive Report*, Kauffman Centre for Entrepeneurial Leadership at the Ewing Marion Kauffman Foundation.

Reynolds, P.D., W.D. Bygrave, E. Autio, L.W. Cox, & M. Hay., 2002, *Global Entrepreneurship Monitor 2002 Executive Report*. Babson College, Ewing Marion Kauffman Foundation and London Business School.

Reynolds, P.D., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., Lopez-Garcia, P. and Chin, N., 2005, "Global Entrepreneurship Monitor: Data Collection Design and Implementation, 1998-2003", *Small Business Economics*, 24: 205-231.

Robinson, K.C. and McDougall, P.P., 2001, "Entry Barriers And New Venture Performance: A Comparison Of Universal And Contingency Approaches." *Strategic Management Journal,* 22: 659-685

Robinson, R.J. and M. Van Osnabrugge, 2000, *Angel Investing.* Jossey-Bass

Schmitz, James A., 1989, 'Imitation, Entrepreneurship, and Long-Run Growth', *Journal of Political Economy,* 97**:** 721–739.

Schreyer, P., 2000, "High Growth Firms and Employment", OECD STI Working Paper 2000/3.

Schumpeter, J. A., 1996, *The Theory of Economic Development.* London, UK, Transaction Publishers.

Scholtens, B., 1999, "Analytical Issues in External Financing Alternatives for SBEs," *Small Business Economics*, 12: 137-148.

Shane, S. and Venkataraman, S., 2000, "The promise of entrepreneurship as a field of research", *Academy of Management Review* 25: 217-226

Siegfried J.J. and Evans L.B., 1994, "Empirical studies of entry and exit: a survey of the evidence." *Review of Industrial Organization* 2: 121–155.

Sohl, J.E., 1999, "The Early Stage Equity Market in the United States," *Venture Capital: An International Journal of Entrepreneurial Finance* 1: 101-120

Specht, P.H., 1993, "Munificence and carrying capacity of the environment and organisation formation." *Entrepreneurship Theory and Practice*, 17(2):77-86.

Stigler, G.J., 1968, *The Organization of Industry*. Homewood, IL. Richard D. Irwin.

Storey, D.J., 1991, "The Birth of New Firms – Does Unemployment Matter? A Review of the Evidence," *Small Business Economics*, 3(3): 167-178

Utterback, J., 1994, *Mastering the dynamics of innovation*. Cambridge, MA: Harvard Business School Press.

Van Auken, H. E., 1999, "Obstacles to business launch", *Journal of Developmental Entrepreneurship*, 4: 175-187.

Westhead, P. and Cowling, M., 1995, "Employment Change in Independent Owner-Managed High-Technology Firms in Great Britain", *Small Business Economics,* 7: 111-140

Wetzel, W.E., 1982, "Risk Capital Research." In *Encyclopaedia of Entrepreneurship,* eds. C.A. Kent, D.L. Sexton & K.H. Vesper. Englewood Cliffs, NJ: Prentice Hall.

Wetzel, W.E., 1983, "Angels and Informal Risk Capital." *Sloan Management Review* 24: 23 – 34.

Wong, P.K., Y.P. Ho and E. Autio, 2005a, "Entrepreneurship, Innovation, and Economic Growth: Evidence from GEM Data", *Small Business Economics*, 24(3): 335-350.

Wong, P.K.. Ho, Y.P and Autio, E., 2005b, "Determinants of Angel Investing Propensity: Evidence from the Global Entrepreneurship Monitor Dataset" in Zahra. S. et al. (eds), *Frontiers of Entrepreneurship Research 2004*, Wellesley, MA: Babson College (upcoming)

World Bank, 2004, *Doing Business in 2004: Understanding Regulation*, Washington: World Bank and Oxford University Press

Zimmer, C., & Aldrich, H., 1987, "Resource mobilization through ethnic networks: Kinship and friendship ties of shopkeepers in England", *Sociological Perspectives* 30(4): 422-455.

Table 1: Influence of Availability of Financing Sources on Entrepreneurial Propensity

	High Growth Potential TEA		Opportunity TEA		Necess
	Dependent Variable				
	Value	**Sig.**	**Value**	**Sig.**	**Value**
Ad R sq	0.193		0.420		0.488
F	2.291	0.081	4.907	0.004	6.144
	Std. Beta	**Sig.**	**Std. Beta**	**Sig.**	**Std. Beta**
Control					
(Constant)	t=0.308	0.761	t=-0.688	0.498	t=1.989
Average compound growth in real GDP per employed person 1997-2002	0.097	0.598	-0.148	0.346	-0.067
GDP per employed person 2002	0.174	0.378	**-0.363****	0.038	**-0.654****
Predictors					
Informal Investors as % of Adult Pop 2002	**0.520****	0.009	**0.616****	0.001	0.117
Classic VC as % of GDP 2002	0.071	0.691	0.193	0.213	0.102
Availability of Debt Financing	-0.049	0.798	0.236	0.159	-0.195

** significant at 5%
 Sample Size = 28 (30 countries with VC data excluding Italy and Poland, which did
not have expert informant's data on debt financing)

Table 2: Influence of Availability of Financing Sources and Regulatory Business Cost on Entrepreneurial Propensity

	High Growth Potential TEA		Opportunity TEA		Dependent Variable Necess
	Value	Sig.	Value	Sig.	Value
Ad R sq	0.334		0.469		0.695
F	4.403	0.004	7.000	0.000	16.488
	Std. Beta	Sig.	Std. Beta	Sig.	Std. Beta
Control					
(Constant)	t=0.550	0.587	t=2.108	0.044	t=2.831
Average compound growth in real GDP per employed person 1997-2002	0.211	0.190	-0.207	0.150	**-0.300****
GDP per employed person 2002	0.006	0.977	**-0.479****	0.011	**-0.623****
Predictors					
Informal Investors as % of Adult Pop 2002	**0.537****	0.001	**0.584****	0.000	0.146
World Bank Index of Regulatory Business Cost	-0.148	0.545	**-0.449****	0.046	0.037
World Bank Index of Regulatory Business Cost X GDP per employed person (interaction term)	0.266	0.186	**-0.414****	0.025	**-0.487****

** significant at 5%

Sample Size = 36 (all countries, excluding Iceland which did not have regulatory business cost data in the World Bank Doing Business database)

Appendix A1: List of Countries in GEM 2002 Survey

COUNTRIES	Entrepreneurial Propensity				Financing		Regulatory Cost of Business			
	Overall TEA	Opportunity TEA	Necessity TEA	High Potential TEA	Informal Investor Prevalence	VC Investment as % of GDP	Number of Procedures	Length of Procedures	Cost of Procedures (% of GDP per cap)	Minimum Capital (% of GDP per cap)
ARGENTINA	14.15	7.13	6.77	0.44	2.05	.	15	32	15.7	8.1
AUSTRALIA	8.68	1.53	6.69	1.46	1.81	0.10	2	2	2.1	0
BELGIUM	2.99	0.31	2.35	0.64	1.73	0.06	4	34	11.3	14.1
BRAZIL	13.53	7.50	5.78	0.25	0.62	.	17	152	11.7	0
CHINESE TAIPEI (TAIWAN)	4.27	0.71	3.33	0.89	3.74	.	8	48	6.3	224.7
CANADA	8.82	1.10	7.36	1.67	3.17	0.41	2	3	1	0
CHILE	15.68	6.74	8.53	2.93	4.02	0.18	9	27	10	0
CHINA	12.34	6.97	5.61	1.22	4.99	0.01	12	41	14.5	1104.2
CROATIA	3.62	0.85	2.18	0.65	1.41	0.02	12	49	14.4	24.4
DENMARK	6.53	0.43	5.90	0.96	3.37	0.14	4	4	0	48.8
FINLAND	4.56	0.33	4.10	0.72	2.99	0.12	3	14	1.2	29.3
FRANCE	3.20	0.09	2.84	0.57	1.23	0.08	7	8	1.1	0
GERMANY	5.16	1.15	3.92	1.47	3.36	0.09	9	45	5.9	48.8
HONG KONG	3.44	1.19	2.25	0.50	3.42	0.21	5	11	3.4	0
HUNGARY	6.64	2.11	4.00	0.76	2.2	0.05	6	52	22.9	86.4
ICELAND	11.32	0.92	8.62	3.97	7.48	0.14	.	.	.	.
INDIA	17.88	5.04	12.42	0.04	2.89	.	11	89	49.5	0
IRELAND	9.14	1.38	7.77	1.52	3.25	0.10	4	24	10.3	0
ISRAEL	7.06	1.40	5.22	1.14	1.51	0.73	5	34	5.5	0
ITALY	5.90	0.53	3.34	0.71	1.43	0.07	9	13	16.2	11.2
JAPAN	1.81	0.51	1.24	0.16	0.63	0.04	11	31	10.6	74.9
KOREA	14.52	4.12	8.55	2.11	5.02	0.97	12	22	17.7	332

COUNTRIES	Entrepreneurial Propensity				Financing		Regulatory Cost of Business			
	Overall TEA	Opportunity TEA	Necessity TEA	High Potential TEA	Informal Investor Prevalence	VC Investment as % of GDP	Number of Procedures	Length of Procedures	Cost of Procedures (% of GDP per cap)	Minimum Capital (% of GDP per cap)
MEXICO	12.40	2.70	8.28	0.31	6.15	.	8	58	16.7	15.5
NEW ZEALAND	14.01	2.25	11.57	3.15	4.46	0.04	2	12	0.2	0
NETHERLANDS	4.62	0.50	4.03	0.73	1.83	0.16	7	11	13.2	66.2
NORWAY	8.69	0.37	7.42	1.25	5.09	0.10	4	23	2.9	28.9
POLAND	4.44	1.27	2.84	0.19	0.57	0.03	10	31	20.6	237.9
RUSSIA	2.52	0.56	1.90	0.12	1.42	.	9	36	6.7	5.6
SOUTH AFRICA	6.54	2.38	3.30	0.00	3.19	0.07	9	38	9.1	0
SINGAPORE	5.91	0.86	4.94	1.33	3.61	0.36	7	8	1.2	0
SLOVENIA	4.63	1.37	3.26	1.51	2.53	0.02	10	61	12.3	19
SPAIN	4.59	1.02	3.42	0.64	3.11	0.13	6	108	16.5	16.9
SWEDEN	4.00	0.67	3.33	0.63	2.84	0.31	3	16	0.7	36.9
SWITZERLAND	7.13	0.87	6.03	1.07	3.83	0.03	6	20	8.6	33.2
THAILAND	18.90	3.35	15.31	0.70	5.28	.	8	33	6.7	0
UNITED KINGDOM	5.37	0.69	4.38	0.99	1.69	0.09	6	18	0.9	0
UNITED STATES OF AMERICA	10.51	1.15	9.11	0.81	4.93	0.40	5	5	0.6	0

Appendix A2: Pearson Correlation Coefficients Between Variables in Estimation Equation

	1)	2)	3)	4)	5)	6)	7)	8)	9)
1) High-growth Potential TEA	1.000								
2) Opportunity TEA	0.401**	1.000							
3) Necessity TEA	0.059	0.429**	1.000						
4) Overall TEA	0.335**	0.908**	0.753**	1.000					
5) Average compound growth in real GDP per employed person 1997-2002	0.130	0.023	0.064	0.035	1.000				
6) GDP per employed person 2002	0.150	-0.228	-0.714**	-0.487**	-0.211	1.000			
7) Informal Investors as % of Adult Pop 2002	0.558**	0.612**	0.122	0.516**	0.141	0.030	1.000		
8) Classic VC as % of GDP 2002	0.182	0.324	0.152	0.341	-0.024	-0.019	0.217	1.000	
9) Availability of Debt Financing	-0.012	0.037	-0.463**	-0.202	0.071	0.382**	-0.062	-0.058	1.000
10) World Bank Index of Business Cost	-0.300	0.019	0.658**	0.326	0.278	-0.673**	-0.083	-0.090	-0.396**

** significant at 5%