

Financing, Regulatory Costs and Entrepreneurial Propensity

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ABSTRACT. In this paper, we compared the availability of different types of financing sources to address the issue of capital availability to entrepreneurial propensity and we scrutinise the influence of business costs by utilising a new composite index using data from the World Bank's Doing Business Database. The availability of three types of financing sources was analysed: traditional debt financing, venture capital financing, and informal investments. The study's findings show that only informal investments have statistically significant influence on entrepreneurial propensity. Regulatory business costs were found to deter opportunity driven entrepreneurship, but had no impact on necessity entrepreneurship.

KEY WORDS: business cost, entrepreneurial activity, financing, informal investment, venture capital.

JEL CLASSIFICATIONS: G24, L26, M13.

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. To examine the impact of regulatory costs, we utilise data on government regulation of business registration.

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. Empirical studies have found that high entry barriers deter new venture entry (Dean and Meyer, 1996). 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. A more detailed overview of the relevant theoretical and empirical literature on entry barriers is presented in Section 2.1 of the literature review.

Our choice to study capital requirements and regulatory costs is motivated by studies that have found these two factors to be important in deterring entry of new firms. The deterrent effect of government-imposed costs on new firm entry has been observed in several studies such as de Soto (1990), Klapper et al. (2004) and Desai et al. (2003). Capital requirements deter new firm entry in two ways. Firstly, certain complicated production processes need large amounts of capital that few entrepreneurs are capable of acquiring, as discussed by economists such as Bain (1959) and Koch (1974). Secondly, capital requirements deter entry of new firms that have limited access to capital (Van Auker, 1999). A more detailed discussion of the pertinent literature on capital requirements and regulatory costs as entry barriers is presented in the literature review in Section 2.

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Previous studies on these two entry barriers have mainly analysed firm entry behaviour at the industry, firm and individual levels. In this paper, the focus is on entrepreneurship at the national level; specifically, we examine if these deterrent factors explain differing levels of entrepreneurship across countries. The level of entrepreneurship is measured by the national rate of entrepreneurial propensity. Consistent with the earlier studies, we define entrepreneurship in the context of entry by newly created firms. This is also in line with researchers such as Gartner (1990) that have argued the importance of new venture creation in the study of entrepreneurship. However, we adopt a broader view where entrepreneurship is not limited to the actual outcome of firm formation. Adapting a suggestion by Davidsson (2003), we view entrepreneurship as the behaviours and actions undertaken by entrepreneurs in the process of forming new ventures. The entrepreneurship process includes both the discovery and exploitation of ideas for new ventures (Shane and Venkataraman, 2000). As such, the outcome of actual venture formation is only part of the entrepreneurship process and firm formation rates are an incomplete measure of national entrepreneurial propensity. Following Reynolds et al. (2005), national entrepreneurial propensity is the aggregate result of individual decisions to become entrepreneurs, where entrepreneurs are broadly defined as persons who engage in any behaviour related to new business creation. In addition to individuals who are involved in running newly-formed firms, anyone who is attempting to start a new venture qualifies as an entrepreneur in this definition, regardless of the outcome of the attempt. Correspondingly, the process of entrepreneurship encompasses the behaviour of newly-created ventures as well as all start-up attempts, whether successful or not.

This paper makes two contributions to the literature: 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 entre-

preneurial 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. *Entry barriers for new firms*

Bain (1956) pioneered the study of entry barriers faced by firms attempting to enter new markets and industries. In Bain's theory, barriers to entry are necessary for existing incumbent firms with significant market share to acquire market power and reap monopoly profits. In the absence of entry barriers, easy entry would enable such profits to be competed away. Bain therefore defines entry barriers as "the advantages of established sellers in an industry over potential entrant sellers, these advantages being reflected in the extent to which established sellers can persistently raise their prices above a competitive level without attracting new firms to enter the industry". Under this approach, Bain identified three entry barriers: economies of scale, product differentiation and absolute cost advantages connected to capital requirement.

These entry barriers arise from incumbent firms' ability to capitalise on the advantages they enjoy in terms of being relatively larger in size, having spent more heavily in marketing and advertising and greater ability to raise external capital due to their established track records. Subsequent to Bain's seminal work, other authors have identified a number of other entry barriers, as summarised by Karakaya and Stahl (1989).

Many entry barriers developed in the literature are applicable both to new-firms entrants and diversifying firms. However, Gorecki (1975) found that entry barriers tend to have stronger deterrent effect on new venture formations than on entry by existing firms. A number of studies in the literature on entrepreneurship have explored the effect of entry barriers on new firm entry rates (Dean and Meyer, 1996; Arauzo-Carod and Segarra-Blasco, 2005). Generally, these studies have found that high entry barriers deter

new venture entry. These studies have looked at a range of entry barriers and typically include economies of scale and capital requirements.

In the following sub-sections, we review the literature pertaining to two types of entry barriers that are central to this paper, capital requirements and regulatory costs of business entry. In discussing capital requirements as an entry barrier for new firms, we focus on the relationship between availability of financing and firm formation. This approach positions availability of financing as a factor that may mitigate the barrier erected by capital requirements.

2.2. The relationship between availability of financing and new venture formation

In the entrepreneurship literature, the importance of capital to new ventures is well established. The probability of individuals becoming entrepreneurs is found to increase with their wealth and the size of the assets that they control (Evans and Leighton, 1989). 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 (Kauermann et al., 2005) and grow (Bamford et al., 2004).

To establish conceptually the importance of financing to entrepreneurs, we survey a number of studies that have suggested that capital requirements deter new firm entry. Koch (1974) stated that "... there may exist capital requirements that discourage entry of new firms", positioning financing requirements as a potential entry barrier. The theoretical literature suggests that capital requirements act as an entry barrier in two ways.

Firstly, in industries with high capital requirements, incumbent firms enjoy "absolute cost advantages" over potential new entrants (Bain, 1956). For certain industries with complicated and expensive production processes, incumbent firms have likely established economies of scale that facilitate higher efficiency. Few entrepreneurs are capable of acquiring the large amounts of capital required to match the scale

of incumbent firms in such industries. In this way, capital requirements discourage the entry of new firms.

Empirical studies have supported the deterrent effect of high capital requirements in terms of size of capital investments needed to be competitive. Using data on 382 US manufacturing industries and defining capital requirements as per Bain (1956), Dean and Meyer (1996) found that capital requirement significantly deterred new venture formation. Arauzo-Carod and Segarra-Blasco's (2005) study of the Spanish manufacturing sector found that the size of industries' scale economies affect the ability of potential entrants to enter those markets and this effect was stronger for smaller-sized entrants.

Other than imposing a barrier in the form of large scale and high investments, the other aspect of capital requirement 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 (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 were the most significant obstacle standing in the way of business launch. The resources required to form a new firm are usually beyond the means of individual entrepreneurs (Bhave, 1994) and lack of funding might be a reason for nascent entrepreneurs to abandon the start-up process (Holtz-Eakin et al., 1994). As a corollary, recent studies have ascertained that lower capital requirements and better access to capital raises the likelihood of firm formation (Van Gelderen et al., 2005).

2.2.1. Financial munificence

In the theoretical literature, researchers who have adopted a resource dependence view of organisations have examined the contribution of external financing sources to the volume of firm creation. Resource dependence theory (Pfeffer and Salancik, 1978) proposes that organisations are dependent on the environment for external resources and information. According to the resource-exchange model pioneered by Pfeffer and Salancik (1978), organisations seek to establish relationships with others in order to obtain

needed resources. The resource-dependence theory provides a basis for analysis how different participants in this exchange relationship are in greater or lesser control, depending on the character of the resources within their control. Acquiring the external resources needed by an organisation comes by modifying an organisation's power with other organisations. In this approach, size of organisations is an important element of the power balance. New and small firms are more subject to environmental forces and external pressures from other organisations (Meznar and Nigh, 1995).

The degree to which required resources are abundant or scarce in the environment is described as environmental munificence (Castrogiovanni, 1991). In the resource-exchange model (Pfeffer and Salancik, 1978), munificence is one of the elements that dictate the degree of inter-connectiveness between organisations. 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.

These concepts 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. 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. These will now be discussed.

2.2.2. 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, bank financing might not be available to them (Berger and Udell, 1998). Entrepreneurs may also lack track record and the ability to signal their current and future capabilities to potential financiers.

2.2.3. 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 (2004) 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. However, as several studies have

estimated, total formal venture capital investment is only a fraction of total informal investment (Reynolds et al., 2002). Reviewing various sources of entrepreneurial capital, Bygrave and Hunt (2004) concluded that VC is the rarest source of capital for nascent entrepreneurs. Classic VC as a percentage of GDP ranged from 0.01 to 0.4% in 27 different countries. In contrast, informal investment as a percentage of GDP is as high as 2.5% in several countries, and averaged above 1% across the countries.

The relative paucity of VC-funded new ventures is due to the fact that 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 correspondingly high and beyond the reach of many smaller start-ups and the number of businesses that can be funded by VCs is limited.

Nevertheless, the importance of VC investments to high-growth companies has led to substantive treatment of VC investments in the literature, as surveyed by Gompers and Lerner (2001). VC firms are seen as having an edge over banks as a source of finance for small, high-growth and high-risk firms, especially specialised technology-based firms. VC firms are active investors with entrepreneurial experience and industry knowledge that both entrepreneurs and banks may lack (Keuschnigg and Nielsen, 2004). 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 certain types of new ventures that are involved with radical innovations and carry higher risks, as VCs offer hands-on business advice to enhance survival rates of their portfolio companies.

2.2.4. *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 (1983) groundbreaking work on business angels in the US. Since then, the importance of angel investment as a source of

finance for new business ventures has become well-established in the entrepreneurship literature (Mason and Harrison, 2000). 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 (Freear et al., 1995).

Two studies have been conducted on informal investment using data from the Global Entrepreneurship Monitor (GEM), as does this study. More detailed descriptions of the GEM dataset and indicators are provided in Sections 3 and 4. These studies 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. These different types of entrepreneurial activities are described in Section 3.

2.2.5. *Deciding between different financing choices*

Cassar (2004) provides an overview of the two broad theoretical principles underlying the financing choices of businesses, the theory of static trade-off choice and the pecking order framework. Both these frameworks take into account explicit costs, represented by lost opportunities in financial payments (e.g. bankruptcy costs), and implicit costs, represented by lost opportunities in the use of non-financial resources (eg. time taken to seek financing sources).

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.

2.3. Regulatory business costs as entry barriers to entrepreneurship

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. However, regulation pertaining to entry is recognised as a barrier to entry. Porter (1980) proposed that government regulation may impose entry barriers to new entrants. Regulatory and procedural requirements entail business costs that potential entrants must incur, in terms of financial outlay and/or time consumed. Prohibitive costs may deter potential entrepreneurs 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 costs of entry regulation. 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 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.

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 (World Bank, 2004, page 19).

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, richer countries were seen to have less burdensome regulatory costs while the OECD group of countries regulated the least compared to other regional groupings. The report also described studies that showed high regulatory business cost to have 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.

Karakaya and Stahl (1989) listed a number of studies, primarily in the economics literature, that have considered government regulations as

barriers to entry. These studies have not focused on entry by newly formed firms and have developed the argument of regulatory barriers to be equally applicable to diversifying firms attempting entry into new industries. However, two recent studies have used the World Bank Doing Business Database and addressed the effect of regulatory barriers on the rate of firm formation. Desai et al. (2003) used data on firm entry rates in 35 European nations and found a negative relationship between firm entry and the number of start-up procedures. Klapper et al. (2004) used data at firm, industry and national levels to determine if entry regulation hampers entry in industries with different average entry rates. The sample covered firms from 47 industries in 34 countries. They found that entry regulation hampers firm entry, more so in industries that have naturally high entry rates.

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 Entrepreneurial Activity (TEA) rates. TEA measures the proportion of a country's adult population who are involved in venture creation activities. It is a composite of two measures: (1) the number of adults who had taken some action to create a new business in the past year and expect to share ownership of the new firm which should be not have paid any salary in the last 3 months (nascent entrepreneurs); (2) the number of adults who are owners-managers of young firms aged between 3 and 42 months old. TEA is an appropriate measure of entrepreneurial propensity in this paper as it comprises activities in the early stage of the entrepreneurship process, during which entry barriers such as capital requirements and regulatory costs are most likely to have an impact. Compared to data on firm formation rates, TEA has the advantage of capturing the nascent entrepreneurs who may not have officially reg-

istered their venture and hence would not be counted in official business registration statistics.

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. We first describe the concepts of opportunity-driven *versus* necessity-driven entrepreneurship, where we implicitly view entrepreneurship in the context of occupational choice or preference, with necessity entrepreneurship representing an extreme of zero choice. Opportunity TEA measures the proportion of adults who are involved in starting a business or are owners-managers of young business because they are motivated to pursue perceived business opportunities. Necessity TEA measures the proportion of adults who are involved in starting a business or are owners-managers of young business because other options for economic activity are absent or unsatisfactory and entrepreneurship is the last resort.

Previous literature on the relationship between entry barriers, availability of financing and rates of firm formation has typically viewed entrepreneurship as opportunity-driven. 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-potential Growth TEA rate identifies the sub-set of early-stage entrepreneurs that are involved in businesses that have "high growth potential". 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.

High-growth potential TEA is of particular interest because research has shown that not all new firms contribute equally to economic growth, arguing that it is rapidly growing firms, rather than small firms in general, that generate the vast majority of new jobs (Birch et al., 1997). 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. Using GDP growth rate as the dependent variable, this study examined the impact of different types of TEA rates on growth across a sample of 37 countries. Opportunity TEA and Necessity TEA were found to be insignificant, while High-growth Potential TEA was a positive and significant determinant of growth.

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.

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. On the other hand, the

characteristics of new firms, such as low-scale potential, may limit the applicability of financing from venture capitalists, who typically invest large amounts in a small number of firms. 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 determinants which are pull factors that induce individuals to form new businesses. 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). 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 et al. (2001). While necessity entrepreneurs may well exploit opportunities, this is not their 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 (as they are defined in the GEM study and its measure of necessity TEA), 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 costs 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 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 costs on Opportunity-driven entrepreneurial propensity will be more negative in higher income countries

H3b: The impact of regulatory business costs 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. 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 costs 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.

In this paper, GEM data are used for measures of entrepreneurial propensity, availability of business angels and availability of debt financing. The benefit of using GEM data is that national-level indicators are harmonised and rendered comparable across countries. Reynolds et al. (2005) demonstrate the reliability and validity of the national TEA rates computed using the GEM procedures. Furthermore, the GEM methodology enables extraction of different measures of entrepreneurial activity, such as Opportunity-driven and Necessity-driven entrepreneurship. The potential drawback of the

GEM dataset is that it is based on survey data and estimates of national-level indicators are subject to sampling error bounds.

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 Table 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. 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 IMF and the 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 1–5, 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 infor-

mal 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 four 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.

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

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. 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.

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

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 ventures 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 I 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.

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 than the values for both the VC and Debt Financing predictors. In the case

TABLE I
Influence of availability of financing sources on entrepreneurial propensity

	Dependent variable							
	High growth potential TEA		Opportunity TEA		Necessity TEA		Overall TEA	
	Value	Sig.	Value	Sig.	Value	Sig.	Value	Sig.
Ad R sq	0.193		0.420		0.488		0.495	
F	2.291	0.081	4.907	0.004	6.144	0.001	6.296	0.001
	Std. Beta	Sig.	Std. Beta	Sig.	Std. Beta	Sig.	Std. Beta	Sig.
<i>Control</i>								
(Constant)	$t = 0.308$	0.761	$t = -0.688$	0.498	$t = 1.989$	0.059	$t = 0.487$	0.631
Average compound growth in real GDP per employed person 1997–2002	0.097	0.598	-0.148	0.346	-0.067	0.647	-0.147	0.318
GDP per employed person 2002	0.174	0.378	-0.363**	0.038	-0.654**	0.000	-0.551**	0.002
<i>Predictors</i>								
Informal investors as % of adult pop 2002	0.520**	0.009	0.616**	0.001	0.117	0.425	0.510**	0.002
Classic VC as % of GDP 2002	0.071	0.691	0.193	0.213	0.102	0.481	0.220	0.131
Availability of debt financing	-0.049	0.798	0.236	0.159	-0.195	0.213	0.063	0.680

** 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).

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 many times that of formal venture capital (Harrison and Mason, 1992; Reynolds et al., 2002) and that informal capital provides funds to 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 included 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 was increased to 36 countries. The results are shown in Table II below.

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,

TABLE II
Influence of availability of financing sources and regulatory business cost on entrepreneurial propensity

	Dependent variable							
	High growth potential TEA		Opportunity TEA		Necessity TEA		Overall TEA	
	Value	Sig.	Value	Sig.	Value	Sig.	Value	Sig.
Ad R sq	0.334		0.469		0.695		0.601	
F	4.403	0.004	7.000	0.000	16.488	0.000	11.227	0.000
	Std. Beta	Sig.	Std. Beta	Sig.	Std. Beta	Sig.	Std. Beta	Sig.
<i>Control</i>								
(Constant)	$t = 0.550$	0.587	$t = 2.108$	0.044	$t = 2.831$	0.008	$t = 2.971$	0.006
Average compound growth in real GDP per employed person 1997–2002	0.211	0.190	−0.207	0.150	−0.300**	0.008	−0.294**	0.022
GDP per employed person 2002	0.006	0.977	−0.479**	0.011	−0.623**	0.000	−0.595**	0.001
<i>Predictors</i>								
Informal investors as % of adult pop 2002	0.537**	0.001	0.584**	0.000	0.146	0.145	0.517**	0.000
World Bank index of regulatory business cost	−0.148	0.545	−0.449**	0.046	0.037	0.822	−0.239	0.211
World Bank index of regulatory business cost X GDP per employed person (interaction term)	0.266	0.186	−0.414**	0.025	−0.487**	0.001	−0.473**	0.004

** 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).

suggests that regulatory business costs only affect 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, on the evidence of this study, availability of debt financing and classic VC were found to be statistically insignificant for these two types of entrepreneurship. Like several studies

that have estimated that total informal capital investment is a high multiple of the volume and value 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 as a contributor to entrepreneurial propensity.

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 analyses.

The statistical 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 lending institutions. However, this finding should be interpreted with

caution due to the perception-based construct for the availability of debt financing. An area for future research is to develop better constructs for debt financing availability.

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 (Dean and Meyer, 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 in that they represent exploitation of opportunities to create value, these findings underline the importance of encouraging business angel investment and the need for reform of business regulations that may inhibit 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 emphasised 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 appear 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.

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. This study indicates that supply constraints such as business costs may have no effect on this type of entrepreneurial activity. 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. However, the study does provide some preliminary evidence that early-stage venturing with focus on growth and innovation is truly opportunity-driven. This type of activity is believed to represent “real” entrepreneurship in the Schumpeterian sense of having high potential impact on the market. The study provides support for the public policy focus, current in many developed countries, to try to promote technology and knowledge-based firms that exhibit high growth and high job creation rates (Shreyer, 2000; OECD, 1998).

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Notes

¹ A number of studies do not distinguish between entry of existing firms into an industry, as opposed to entry by new firms. In this paper, our focus is solely on entry of newly created business ventures.

² The work of Hernando de Soto (1990) describes the situation in underdeveloped countries, where the immense swamp of regulations impede the process of capitalism.

³ The term Total Entrepreneurial Activity (TEA) is slightly misleading as it excludes entrepreneurial activities of adults who are involved in businesses more than 42 months old.

⁴ We also used growth in GDP per capita as an indicator of economic growth. The results were found to be largely similar.

⁵ 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.

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
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	0.130	0.023	0.064	0.035	1.000				
per employed person 1997–2002									
(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%.

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