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Abstract:

This paper examines the prevalence and the determinants of informal entrepreneurial investment activity (i.e. the 3 FFFs –friends, fools and family– and business angels), using a data set of more than 175,000 individuals – including some 4000 informal investors – in a large number of highly developed countries over the period 2002-2004. We distinguish between micro-level and macro-level determinants. The results uncover a positive virtuous circle where the demand for business angel finance tends to generate its own supply as a result of micro and macro factors. Our results also suggest that higher levels of entrepreneurial activity at the country level increase the probability that venture capital and business angel finance work in tandem with one another as complements rather than substitutes. Overall, the results uncover some important new relationships that perhaps provide some good news that market forces to some extent appear to naturally ameliorate equity gaps faced by entrepreneurs.

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1. Introduction

When starting a new business, entrepreneurs can utilize several financing sources. Besides own capital and bank loans, formal and informal investors can provide venture capital to the entrepreneur (Berger and Udell, 1990). Informal investors play a significant role in the financing of new entrepreneurial ventures. Bygrave et al. (2003) state that informal venture capital is the primary source of external equity finance for new businesses. Several studies highlight the role of informal investors and describe extensively the characteristics, involvement and behavior of informal investors (cf. Landström, 1998; Hindle and Wenban, 1999). Still, there is little empirical research explaining the factors that determine the propensity of individuals to make informal investments in businesses owned by others (Maula et al., 2005; Szerb et al., 2007). This is mainly caused by limited availability of data on informal venture capital. In this paper we investigate the determinants of the propensity of individuals to make informal investments using the Global Entrepreneurship Monitor (GEM) micro dataset for the participating countries in GEM 2002-2004. We will make a comparison between the profiles of informal investors and non-investors, and will seek to derive policy implications for the participating countries.

As the number of informal investors is relatively low in several developed countries like the Netherlands and the United Kingdom, we are interested in the factors that determine informal investments. We draw on management, finance and economics research theory in order to outline a comprehensive list of hypotheses relating to the interaction between entrepreneurial activity and the supply of informal investors. Individuals making an informal investment are called either 'business angels' or one of the 3 FFFs - friends, fools and family -, by which we mean that they personally provide funds for a new business started by someone else, excluding any purchases of stocks or mutual funds (Kelly, 2007). We then outline an empirical methodlody and test the hypotheses. We specify and estimate equations, at the individual (micro) level, explaining the prevalence of informal investors. A novelty of the research is that it is one of the first studies that analyses the factors that drive informal investment. Furthermore, the empirical testing has a strong advantage of empirical rigour compared to the descriptive studies which have dominated this data scarce field.

We use the individual level data from the Adult Population Survey for all countries participating in GEM in the years 2002 to 2004 to estimate the equation. The countries can be divided in two groups according to the nature of the markets in those countries, i.e. high versus low entrepreneurially active markets. We make use of this distinction in part of our analysis.

The paper proceeds as follows. In section 2 we start with a literature review and present our hypotheses. In section 3 we discuss the data. This section also contains an extensive subsection presenting descriptive statistics on business angel prevalence, making a distinction between highly and lowly developed countries. Section 4 outlines the research approach and discusses the methods that will be used in the analysis. Subsequently, we report the results of the regression analyses. These regressions focus on highly developed countries only. The paper concludes with a discussion covering the main findings, policy implications and recommendations for further research.

2. Theory and hypotheses

We now outline a number of schools of thought with the potential to influence the relationship between an individual's involvement with entrepreneurship and informal investment activity. The entrepreneurial finance literature distinguishes between two types of informal investors known as the 3 FFFs and (pure) business angels (Bygrave et al., 2003, and Sohl, 1999, 2003). The 3 FFFs denoting Friends, Fools and Family refer to individuals who engage in informal investment who have a close personal relationship with the entrepreneur/s. This relationship is

probably one of the reasons why they have made the investment. Either they may trust the entrepreneur/s and/or simply want to help them. These non-pecuniary influences do not preclude a simultaneous financial motivation. By contrast, the second group of informal investors, business angels, are those investing more purely for financial reasons and hence one would expect this type of investment to be carried out in a more professional and indeed formal manner. Later when we discuss the data we will be able to distinguish between people who are 3 FFF investors from those who invest in businesses run by strangers (i.e. pure business angels). Venture capitalists (VCs) distinguish themselves from informal investors usually on the basis that they invest larger sums, focus more on later stage investment and as a formal financial services company are more heavily regulated.

The main motivation for our research is to investigate the relationship between entrepreneurial activity and the supply of informal investors. To date most research takes a very static view where entrepreneurial activity causes an increase in demand and hence shortage in the supply of venture capital. We intend to investigate the possibility that there may be some endogeneity where entrepreneurial activity promotes the supply of informal investors. This relationship has major implications for medium-longer term entrepreneurial performance.

We think there are four broad schools of research that have a bearing on the probability of a person with some involvement in entrepreneurship becoming an informal investor. The first of these is taken from classical economics' limited resource allocation theory dating back to the work of Smith (1776) and Marshall (1890). In this framework individuals have limited endowments of time (labor) and money (capital). They optimise the use of these in their career. Therefore, more time or money spent in one activity leaves less of these resources available for other activities. Like venture capitalists, informal investors have limited amounts of finance and have to allocate their time between finding, then screening, then enticing, then negotiating and then contracting with business ventures (investment opportunities) as well as managing these investments and also engineering harvest/exits (see Riding et al., 2007, for an overview). Campbell (2003) argues that one of the distinguishing features dividing business angels from venture capitalists is that the former frequently do not have enough funds to finance a venture through to exit. By consequence given that the time and finance requirements for running a business are considerable, this school of thought would predict either an insignificant or negative relationship between entrepreneurial activities and the probability of becoming an informal investor. Therefore, if this resource constraint binds then there will be a negative relationship between entrepreneurial activity and the probability of being a 3 FFF or business angel. If on the other hand involvement in entrepreneurship rarely exhausts finance and time resources to the point that they impinge upon the capability of becoming an informal investor then a zero or insignificant relationship should result. This gives us Hypothesis 1.

> *Hypothesis 1: The classical economics limited resources model implies either a negative or insignificant relationship between entrepreneurial activity and the probability of becoming an informal investor for time and/or finance resource constrained and unconstrained individuals respectively.*

The next school of thought is compiled from a number of different areas of research. A central theme is the belief that far from causing a trade-off with the probability of becoming an informal investor, entrepreneurial activity actually promotes it. Given its conflict with classical economics it is perhaps not too surprising to find that the central argument of Keynesian economics that demand will generate its own supply plays a role (Keynes, 1936). The basic application of Keynesian logic to the case at hand is that greater entrepreneurial activity creates a demand for informal finance which manifests itself in the creation of new entrepreneurial investment oppor-

tunities for FFFs/business angels. The availability of increased opportunities encourages an increase in the number of informal investors who are keen to exploit them. This is nothing other than a perfectly elastic Keynesian supply schedule – of course, this time the supply of informal investors. But it is important to point out that the Keynesian argument is about an aggregate effect and not an intra individual circularity of causation between entrepreneurial and informal investment activity. Therefore, in the current context Keynes' logic is not necessarily in conflict with the classical hypothesis 1 which concerns an individual but by contrast would imply that at the aggregate level countries with greater levels of entrepreneurial activity will increase the probability of any individual becoming an informal investor. We test this proposition by including the aggregate level of entrepreneurial activity as an independent variable in equations to predict the likelihood that an individual will become a business angel and/or FFF informal investor.

> *Hypothesis 2a: An individual in a country with higher levels of entrepreneurial activity is more likely to become a business angel than an individual in a country with a lower level of entrepreneurial activity.*

We must also consider the fact that informal entrepreneurial investment typically occurs at an earlier stage than venture capital investment. VC activity can provide follow on funding as well as exits for informal investors thereby forming a complementary positive relationship between the two activities. However a young or underdeveloped venture capital industry (without a long track record to enable large scale fund raising) typically involves smaller VC fund size forcing more smaller scale and hence early stage investments. Likewise, a less entrepreneurially active economy may not provide the scale of investment opportunities required for larger scale (later stage) VC fund raising and an adequate portfolio size for disbursements. Therefore, in less active entrepreneurial markets informal investors and venture capitalists may find themselves more frequently in competition with one another for early stage investments i.e. they are more often substitutes rather than complements. This gives rise to hypothesis 2b.

> *Hypothesis 2b: The higher the level of entrepreneurial activity in a country, the greater the likelihood and scale of a positive relation between the level of VC investment per capita and the probability of any individual of becoming an informal investor.*

The strongest theoretical challenges to the classical hypothesis 1 in fact does not come from the Keynesian school but from other quarters. One source is human resource management theory and closely associated labor economics (e.g. Evans and Jovanovic, 1989 and Blanchflower and Oswald, 1998). These relate an individual's profile in terms of ability and motivation and how well this fits with any particular career. In essence, we note that many of these profile characteristics are similar between informal investors and entrepreneurs. Both would have skills/ability relevant for business venturing, some wealth/finance for investment, have a propensity to take risks, a tolerance of ambiguity and enjoyment of the buzz/excitement associated with new ventures (Knight, 1921, Burke et al., 2000, Campbell, 2003, Kelly, 2007, and Riding et al., 2007). Therefore, if a person chooses to spend some of their career in entrepreneurship this school of thought would argue that, all other things being equal, they would have an above average probability of becoming a business angel or 3 FFF investor.

> *Hypothesis 3: The HRM-Labor economics schools of thought imply a positive relationship between an individual's entrepreneurial activity and the probability of becoming an informal investor.*

The fourth and final school of thought draws on a diverse research literature and we label this group the entrepreneurial capital accumulation school of thought. In essence, a wide array of research appears to indicate that far from depleting resources necessary to become a business angel, entrepreneurship is more likely to enhance these resources thereby raising the probability that these people will choose to become an informal investor. Birley (1985) highlights the importance of networks in the entrepreneurial and business angel community. Therefore, being entrepreneurially active builds social capital useful for business angel activity. Bhide (2000) and Birley (2002) both point out how being an entrepreneur helps to build credibility and a reputation. Gompers and Lerner (1999) highlight the importance of reputation as a means of enabling venture capitalists to raise funds. While most informal investors use their own funds, Harrison and Mason (1996, 2000) point out the importance of business angels operating in networks and co-investing with other business angels. In such an environment a reputation for having entrepreneurial expertise increases the ability of an informal investor securing co-investors; especially important if an entrepreneur has limited financial resources and wants to overpower the constraints of hypothesis 1. Being entrepreneurially active indicates hands on experience which can be crucial in order to signal to others that the individual has some expertise drawn from experience. Learning by doing/discovering (Nelson and Winter, 1982, Jovanovic, 1982, Minniti and Bygrave, 2001), knowledge spillovers (Audretsch and Feldman, 2004) and endogenous growth theory (Romer, 1994) also play a role here too. In essence being entrepreneurially active can be a 'learning academy' through which many of the skills learnt are relevant for successful informal investment activity.

However, it is not all about social and human capital accumulation. Involvement in entrepreneurship can be a very rewarding activity and result in wealth (financial capital) accumulation. This in turn can increase the propensity for an individual to take risks (Burke and Hanley, 2003 and 2006) and so raise the probability that they will become an informal investor. Likewise, since early stage investment finance is usually too risky for bank finance there is a constraint on business angels financing investment through leveraged finance. Therefore, wealth accumulation through entrepreneurial activity may reduce finance constraints and enable latent business angels to become active. There is a wide bank of evidence to show that these effects apply to entrepreneurs investing in their own business spurred on by lottery windfalls (Taylor, 2001), inheritance (Blanchflower and Oswald 1998, Burke et al 2000) and so it would be reasonable to expect that they may play a role in encouraging individuals to invest in the ventures of family, friends and strangers. We combine the impact of all these various theories of social, human and financial capital accumulation acquired through being entrepreneurially active on the probability of becoming an informal investor as follows:

> *Hypothesis 4: The entrepreneurial capital accumulation school of thought indicates that entrepreneurial activity will increase an individual's endowment of resources necessary for informal venture finance and hence increases the probability of an individual becoming a business angel or 3 FFF.*

We test these hypotheses using a range of different measures at the level of the individual using independent variables relating to past, present and future (planned) entrepreneurial activity. We also test for the impact of being involved in intrapreneurship. The robustness of our results is tested by dividing the sample into countries with low and high levels of entrepreneurial activity in order to assess if our results are unique to or consistent with both types of market. This also enables us to test hypothesis 2b, i.e. we ascertain whether business angel and VC investment work as complementary sources of finance or as competitors in high and low entrepreneurially active markets. We also differentiate between informal investment of the 3 FFFs category versus more purely defined business angel investment in ventures owned by strangers.

3. Data description

3.1. GEM Adult Population Survey

In order to investigate the determinants of informal investments, we use individual level data from the Global Entrepreneurship Monitor (GEM). The GEM survey contains various measures that give insight into the degree of entrepreneurial activity, as well as attitudes and perceptions towards entrepreneurship. These data are collected by a standardized telephone survey based on approximately 2000 adult respondents per country, making the GEM survey representative for the population. As the GEM survey is conducted in the same way each year, we pool three years of data, namely 2002, 2003 and 2004. Not all countries in the data set participated in the GEM survey for each of these years. Hence we will use an unbalanced panel data set (in terms of countries) for our analyses. In total we use data for 45 different countries (listed in Table 1 in Section 3.5), corresponding to 364,843 observations. Among these observations are 8,554 informal investors (2.4%). In our analyses we will distinguish between higher and lower developed countries. As will be described later, for our descriptive statistics analysis we will use data for all countries, while our more formal regression analysis will use data for 28 higher developed countries only (this is related to data availability).

3.2 Dependent variable

In this paper we estimate an equation, at the individual (micro) level, explaining the prevalence of informal investment. The main dependent variable we use in our analyses is whether a respondent is an informal investor or not. The following question is asked in the GEM survey: "You have, in the past three years, personally provided funds for a new business started by someone else, excluding any purchases of stocks or mutual funds" (yes/no). In addition, there is a question about the relationship with the person that received this personal investment. The possible answers are 'close family member', 'some other relative, kin or blood relation', 'a work colleague', 'a friend or neighbour' or 'a stranger with a good business idea'.[1] We aggregate the first-mentioned four categories into one category labelled friends and family (diplomatically leaving out the term fools), so that we distinguish three main categories of individuals: not an informal investor, informal investor in a firm of a friend or family member, and business angel investing in a firm of a stranger. We will estimate a multinomial logit model where the prevalence of these three categories is explained.

3.3 Independent variables

The first group of explanatory variables are related to entrepreneurial activity at the individual level (past, present and future) and hence have a bearing on hypotheses 1, 3 and 4. The GEM survey asks the respondent whether he or she is currently an owner/manager of a business. The limited resources classical school would view this activity as having a trade-off with informal investment activity. Running a business consumes personal resources thereby reducing the amount of remaining time (labor) and money (capital) available for business angel and 3 FFF informal investment activity. By contrast, both the HRM-labor economics and capital accumulations schools of thought would view a positive relationship – entrepreneurs having similar characteristics in the case of the former and entrepreneurs gaining key capabilities for informal

[1] We only label those individuals who respond to the (second) question of the relationship to the investee, as business angel. Hence, respondents indicating to be a business angel based on the first question ("have you provided funds") but who did not respond to the second question are labeled "no business angel". Vice versa, those who answered no on the first question, but did indicate a type of relationship with an investee, is counted as a business angel. This way we correct the responses of individuals who misunderstood the first question.

investment in the case of the latter. Relating this to our hypotheses in section two gives the following predictions:

Hypothesis 1 supported if: People who currently run a business are less likely to engage in informal investment activity.

Hypotheses 3 and 4 supported if: People who currently run a business are more likely to engage in informal investment activity.

In the GEM survey, the respondent is also asked whether he or she is currently trying to start up a new independent business. The classical school would argue that this process is probably both already diverting resources away from informal investment or causing an individual to reserve finance and time for the forthcoming venture. The HRM- labour economics school would argue that by virtue of the individual choosing to get involved in a new venture he/she also has a profile suitable to become a business angel. The entrepreneurial capital accumulation schools of thought might concede that financial capital is unlikely to be enhanced at this stage but that social and human capital could well be enhanced by both early steep learning and credibility building curves. Therefore, applying hypotheses 1, 3 and 4 to this variable we might expect:

Hypothesis 1 supported if: People who are currently trying to start up a new business are less likely to engage in informal investment activity.

Hypotheses 3 and 4 supported if: People who are currently trying to start up a new business are more likely to engage in informal investment activity.

The GEM survey asks the respondent whether he or she expects to start-up a new business within the next three years. This aspiration could have a number of effects. First, in line with the classical school this may divert finance from informal investment to the new venture hence reducing the ability to become an informal investor. Second, it is plausible that a person planning to start a business might expect to become wealthier soon and if so, this might have a positive effect on the probability of engaging in informal investment activity. The latter effect may be particularly relevant for overly optimistic individuals who are prevalent among entrepreneurs and those willing to take risk of investing in entrepreneurial ventures (de Meza and Webb, 1987, de Meza and Southey 1996). Therefore, in line with HRM-labor economics reasoning the profile of a person expecting to start a new business in the future might be closely associated with one with a desire to also become an informal investor. Depending on the level of preparation one is making for the future start-up (for example, saving money or learning business skills) one might expect the entrepreneurial capital accumulation school of thought to predict an associated rise in the probability of an individual choosing to become an informal investor.

Hypothesis 1 supported if: People who expect to start up a new business within the next three years are less likely to engage in informal investment activity.

Hypotheses 3 and 4 supported if: People who expect to start up a new business within the next three years are more likely to engage in informal investment activity.

Intrapreneurship or corporate venturing is another explanatory variable that we use in our analysis. The GEM survey asks the respondent whether his or her current job involves starting up a new business. Application of the classical school's hypothesis 1 gives an uncertain outcome in this case. Intrapreneurship certainly limits the time an individual can engage in business angel activity. However, employment earnings especially for those involved in corporate venturing

can be lucrative thereby enhancing the amount of finance an individual can devote to informal entrepreneurial investment. Kelly (2007) and Campbell (2003) note that successful business executives account for a significant proportion of business angels. Likewise, the HRM-Labor economics school also gives an unclear predication here. While there are many common activities between intrapreneurship and entrepreneurship one major dividing line is the propensity for risk taking. Therefore, these countervailing influences mean that the HRM-labour economics school have an ambiguous prediction in relation to the impact of intrapreneurship on the probability of an individual choosing to become an informal investor. By contrast the entrepreneurial capital accumulation school of thought gives a prediction of a positive effect. Corporate venturing engages executives with entrepreneurs as well as business angel and venture capital networks thereby raising social capital. In addition, there are many overlaps of skills in launching a corporate venture and an independent start-up so that we would expect this to enhance human capital relevant for business angel activity. Thirdly, as we noted intrapreneurship can be lucrative thereby enhancing financial capital for business angel activity. Combined these imply hypothesis 4 has a bearing on the use of this particular GEM question as an independent variable.

Hypothesis 4 supported if: People who start a new business on behalf of their employer are more likely to engage in informal investment activity.

The GEM survey also asks the respondent whether he or she has shut down a business in the past twelve months. This is also relevant for the various schools of thought. The classical school is again agnostic. If closure of a business is associated with financial losses then it may reduce finance available for 3 FFF and business angel investment. However, closure might monetise positive net assets for the owner as well as freeing up his/her time thereby increasing the probability of becoming an informal investor. There is some evidence in the labor economics literature indicating that the harsh reality of the business world may make an individual less optimistic (Burke, 1997, Fraser and Greene, 2006). In this case a negative relationship could result from business closure and business angel activity. By contrast, the entrepreneurial capital accumulation school would predict a positive influence, namely learning from mistakes or bad experiences increases ability and hence the likelihood of being a more successful informal investor.

Hypothesis 3 supported if: People who have recently shut down their own business are less likely to engage in informal investment activity.

Hypothesis 4 supported if: People who have recently shut down their own business are more likely to engage in informal investment activity.

The final micro-level variable that is included in the analyses in fact tests an almost axiomatic assumption of the business angel research literature and indeed our own analysis. It relates to entrepreneurial skills. One GEM survey question asks each respondent whether he or she has the knowledge, skills and experience to start up a new business. We would imagine that a person who believes that they have entrepreneurial skills is more likely to invest informally, because many business angels actively take part in the firm that they invest in. All three schools of thought would predict a positive relationship between entrepreneurial skills and the probability of an individual becoming a business angel.

Hypotheses 1, 3 and 4 supported if: People with entrepreneurial skills are more likely to engage in informal investment activity.

Concerning our hypotheses at the macro-level (hypotheses 2a and 2b) we use two variables. First, we use GEM's well-known TEA index, defined as the percentage of adult population that is either actively involved in starting a new venture or is the owner/manager of a business that is less than 42 months old. Data on total entrepreneurial activity are taken from the GEM Adult Population Surveys for the years 2002-2004. In particular we focus on those entrepreneurs whose primary motive to become an entrepreneur was that they saw an entrepreneurial opportunity to be exploited (TEA opportunity rate). To test hypothesis 2b, we use a country's (formal) *Venture Capital Investment (VCI) per capita*, measured by classic venture capital invested domestically in thousands of US$ (and divided by population). This variable is not only an indicator of the development of the venture capital industry, but also for the availability of exit opportunities for early stage informal investors. VCI per capita is expected to have a positive effect in the models. We take data from the National Venture Capital Association Yearbook for the years 2002-2004, obtained through secondary data bases collected by the GEM research consortium.[2] Hypotheses 2a and 2b are related to these two variables as follows:

Hypothesis 2a supported if: People from countries with a higher TEA opportunity rate are more likely to engage in informal investment activity.

Hypothesis 2b supported if: The (positive) relation between VCI per capita and the probability of becoming a business angel is stronger for countries with a higher TEA opportunity rate than for countries with a lower TEA opportunity rate.

It is worth noting that support for hypothesis 2b requires both empirical validation of a positive relationship between VCI per capita and the probability of becoming an informal investor as well as observance that the coefficient on this relationship is higher for more entrepreneurially active markets.

3.4 Control variables

Besides the aforementioned independent variables, we want to control for several demographic and structural characteristics of the individuals, like *gender* (1=male, 2=female), *age* (in six categories), and the level of *education* (in three categories).[3] The GEM micro dataset contains demographic variables of the surveyed adult population of each participating country.

Next to these control variables at the micro level, we also want to include control variables at the macro/country level. First, we want to include a country's *Gross Domestic Product (GDP) per capita*, measured in current international dollars in purchasing power parities. It is expected that, on average, people have more money to invest in countries with a higher per capita income. We use data of the International Monetary Fund for the period 2002-2004. A second control variable at the macro-level is the national *rate of GDP growth*, accounting for the business cycle effect. We use World Bank data for the period 2002-2004. The third macro-level control variable is a country's *interest rate*, indicating the cost of capital. Since returns on alternative investments (i.e. regular loans) may be higher, this variable is expected to have a negative effect on the prevalence of being an informal investor. However, there is also a counter effect. When

[2] More specifically, data for the variable Venture Capital Investment are taken from data sets provided in the "GEM Members Area". For the year 2004 we have taken the variable labeled "Classic VC invested domestically $US (1,000)" from the financing data set of 2004. The same variable is used for 2002, but this is taken from the National Venture Capital Data reported in the year 2003 and labeled briefly as "Domestic $US (1,000): total classic". We made an estimation to obtain data for venture capital investment in the year 2003. This estimation is based on classic VC investment growth rates from 2003 to 2004, published in the GEM 2005 Executive Report (Minniti, Bygrave and Autio, 2006, p. 49).

[3] In order to obtain a measure for our first education category (low), we summated the GEM education variables 'none' and 'some secondary education'. The GEM variable 'secondary education' is used for our second education category (middle). Our third education category (high) is obtained by adding the GEM variables 'post-secondary education' and 'graduate experience'.

interest rates are high, it is more expensive for firms to borrow from banks. This may lead to an increased demand for informal investment finance thereby raising the bargaining power of business angels. This is especially relevant to less developed entrepreneurial financial markets where leveraged start-up finance is rare and where loan and equity finance are more likely to be substitutes rather than complements. We use data from the International Monetary Fund for the years 2002-2004.[4]

Besides these control variables we also include continents of country dummies and year dummies. The continents of country dummies correct for structural differences between different parts of the world, while the year dummies control for worldwide business cycle effects (on top of the country-specific gdp growth variable).[5]

3.5 Descriptive Statistics

To get more insight into the characteristics of informal investors, we first pay attention to some descriptive statistics. We distinguish between higher and lower developed countries, based on the World Bank classification of countries.[6] This divides into 17 relatively lower developed countries and 28 relatively higher developed countries. The higher developed countries are further organised by their level of entrepreneurial activity with an opportunity motive (GEM's 'opportunity TEA' index). For each country the average opportunity TEA index over the available years is computed. Within the group of higher developed countries there is a natural split between two groups of countries where the average level of opportunity entrepreneurship is above or below 6.5%. Table 1 provides an overview of the country classification in terms of economic development level and opportunity TEA. We also present the continent of each country.

[4] In particular, we use a variable labeled "interest rate, banks prime lending, per cent per annum, period average".

[5] Because we have a discrete left-hand side variable, we cannot include too many discrete variables on the right-hand side. In order to limit the number of discrete variables on the right-hand side, we use continent of country dummies instead of regular country dummies (note that all micro variables on the right-hand side are also of a discrete nature). The four macro level variables in our model, together with the continent of country dummies, should capture the bulk of the macro level variation in the data though.

[6] Specifically, the lower developed countries include the countries categorised by the World Bank as "low-income economies," "lower-middle-income economies," or "upper-middle-income economies," while the higher developed countries correspond to "high-income economies."

Table 1. Country classification used in this paper

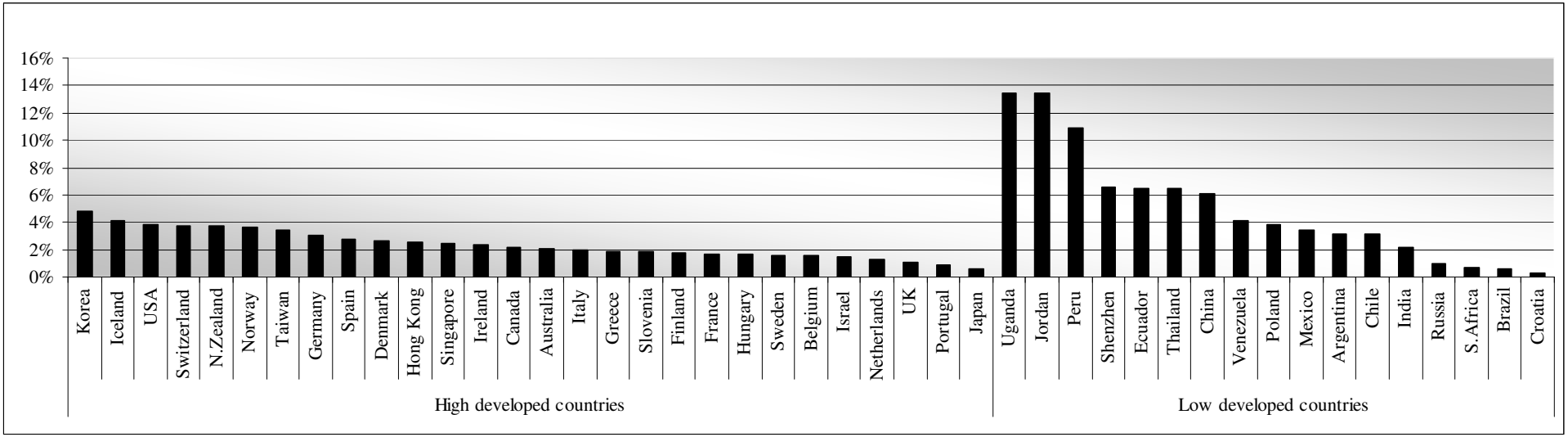
Country	Continent	Low or high economic development level	Opportunity TEA high or low
Argentina	South America	Low	-
Brazil	South America	Low	-
Chile	South America	Low	-
China	Asia	Low	-
China (Shenzhen)	Asia	Low	-
Croatia	Europe	Low	-
Ecuador	South America	Low	-
India	Asia	Low	-
Jordan	Asia	Low	-
Mexico	South America	Low	-
Peru	South America	Low	-
Poland	Europe	Low	-
Russia	Asia	Low	-
South Africa	Africa	Low	-
Thailand	Asia	Low	-
Uganda	Africa	Low	-
Venezuela	South America	Low	-
Belgium	Europe	High	TEA low
Denmark	Europe	High	TEA low
Finland	Europe	High	TEA low
France	Europe	High	TEA low
Germany	Europe	High	TEA low
Greece	Europe	High	TEA low
Hong Kong	Asia	High	TEA low
Hungary	Europe	High	TEA low
Israel	Asia	High	TEA low
Italy	Europe	High	TEA low
Japan	Asia	High	TEA low
Netherlands	Europe	High	TEA low
Portugal	Europe	High	TEA low
Singapore	Asia	High	TEA low
Slovenia	Europe	High	TEA low
Spain	Europe	High	TEA low
Sweden	Europe	High	TEA low
Switzerland	Europe	High	TEA low
Taiwan	Asia	High	TEA low
United Kingdom	Europe	High	TEA low
Australia	Australia	High	TEA high
Canada	North America	High	TEA high
Iceland	Europe	High	TEA high
Ireland	Europe	High	TEA high
Korea	Asia	High	TEA high
New Zealand	Australia	High	TEA high
Norway	Europe	High	TEA high
United States	North America	High	TEA high

We will now discuss some country characteristics of the business angel populations.

Number of informal investors

A cross-country comparison of the percentages of informal investors in the sample shows that the variation is quite large. Figure 1 shows the percentage of informal investors per country for each subset of countries. It follows from this figure that with a minimum percentage of 0.27, Croatia has the smallest share of informal investors among all countries. To the contrary, both Uganda (13.44%) and Jordan (13.44%) have the largest number of informal investors. It is remarkable that the top-5 countries having the largest percentages of informal investors (i.e. Uganda, Jordan, Peru, China (Shenzhen), and Ecuador) are developing countries only. A possible reason for this is that in these countries the venture capital industry will be very small and underdeveloped (perhaps lacking the legal, political and financial industry infrastructure to support VC formal investment funds) and so informal investment becomes the main manner in which investors secure equity in new ventures. Also, in such countries, entrepreneurs are more inclined to borrow money from friends and family due to the culture. Entrepreneurs in developed countries can often more easily utilize own capital, bank loans and/or formal investments. On average, the percentage of informal investors is higher in poor countries as compared to rich countries.

Figure 1. Percentage of informal investors in adult population, average 2002-2004



Source: GEM Adult Population Survey

Amount invested per informal investor

As far as the amount of informal investment is concerned, 73.5% of all informal investors invested an amount of at most US$ 20,000, while 25.5% provided an informal investment of between US$ 20,000 and US$ 1,000,000. Business angel investments of more that US$ 1,000,000 are quite uncommon (1.0%). More detailed information regarding the amount of informal investment in subsets of countries is presented in Table 2. It follows from this table that, on average, informal investors in rich countries invest a relatively higher amount of money than informal investors in poor countries.

To summarize, in rich countries there are less informal investors who invest more on average, while in poor countries there are more informal investors who invest less on average.

Table 2. Amount of informal entrepreneurial investment in US$ (percentage distribution)

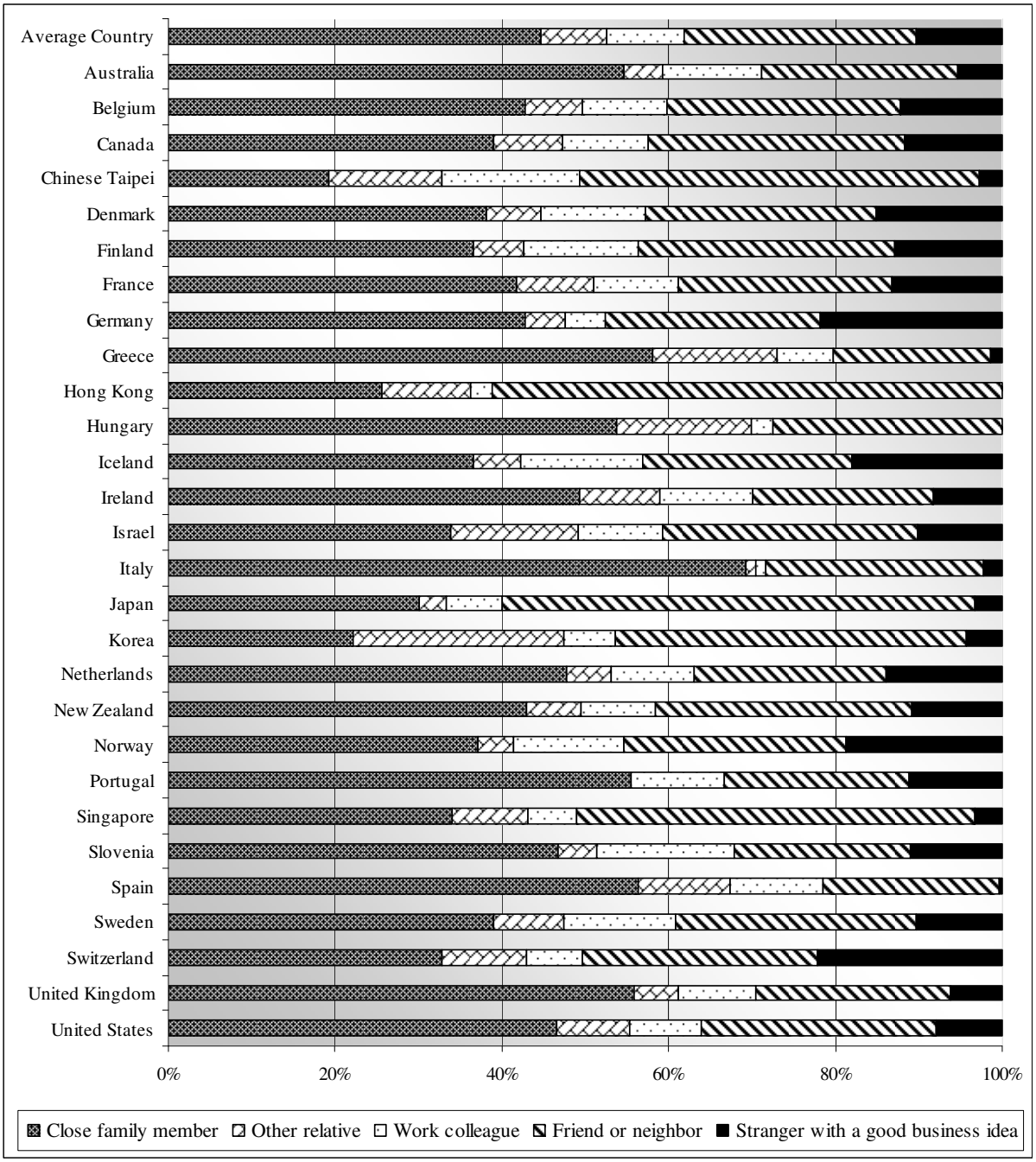
Invested amount (US$)	High developed countries		Low developed countries	All countries
	TEA High	TEA Low		
1 – 99	10.8	2.9	19.9	9.3
100 – 999	8.7	6.4	33.6	14.5
1,000 - 4,999	18.7	19.3	27.8	21.5
5,000 - 19,999	31.1	35.1	13.2	28.1
20,000 - 59,999	18.1	23.4	2.9	16.6
60,000 - 999,999	11.4	12.1	1.5	9.0
at least 1,000,000	1.1	0.8	1.1	1.0
	100.0	100.0	100.0	100.0

Note: The amount of business angel investment is available for 7,027 of the total of 8,554 informal investors.
Source: GEM Adult Population Survey

Relationship to investee

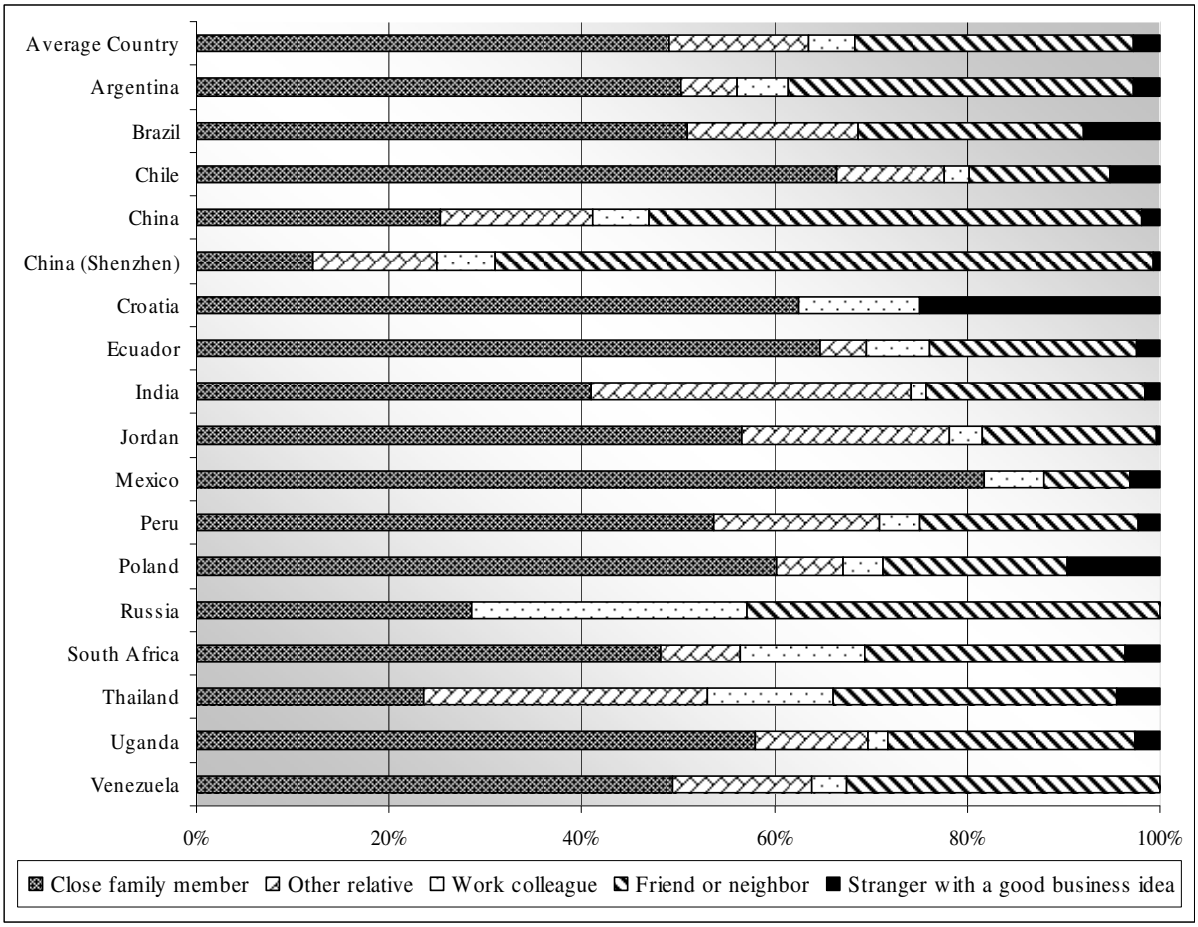
Figures 2a and 2b show the relationship of the business angel to the person that received their personal investment (i.e. the investee) per country. Averaged over all countries, it holds that 45.8% of the informal investors invested in a firm of a close family member, and 28.3% in a business of a friend or neighbour. Investing in firms of a work colleague (8.2%), of another relative (9.4%) or in a firm of ‘a stranger with a good business idea’ (8.3%) occurs significantly less often. When taking a closer look at the relationship of the informal investor to the investee across countries, we see that the differences (across poor and rich countries) are quite large. In some countries people are reticent towards investments in firms of a stranger (e.g. Hong Kong, Hungary, Russia and Venezuela), while this mode of business angel investment is more common for some other countries (e.g. Switzerland and Germany). On average, informal investors in poor countries are more likely to invest in firms of family or friends and less likely to invest in the firm of a stranger, compared to rich countries.

Figure 2a. Relationship of business angel to investee, highly developed countries



Source: GEM Adult Population Survey

Figure 2b. Relationship of business angel to investee, low developed countries



Source: GEM Adult Population Survey

Sector of investment

Table 3 provides an overview of the distribution of informal investors over the sector of economic activity of the investee firm (based on the OECD sector classification): Taking a look at the distribution of informal investors among the firm's sector of economic activity in which they invested it can be seen that 31.2% of all informal investors invested in a firm in the sector retail trade, restaurants and hotels. Firms in business services get 16.8% of the business angel investments, followed by 9.5% in firms in the sector wholesale, motor vehicle sales, and repair. Other sectors achieve less informal investment. Regarding the sector of the investee, there are relatively large differences between informal investors in rich countries and informal investors in poor countries. About half of all informal investors in poor countries invest in the sector retail, hotels and restaurants, while less than a quarter invests in this sector in rich countries. In these countries, informal investors invest relatively more in business services.

Table 3. Sectoral distribution of informal investors (in percentages).

Firm type of investee	High developed countries		Low developed countries	All countries
	TEA High	TEA Low		
Agriculture/Hunting/Forestry/Fishing	8.0	4.9	5.1	5.6
Mining/Construction	8.8	7.1	3.2	6.2
Manufacturing	9.2	8.3	8.5	8.6
Transportation/Communication/Utilities	7.3	6.0	5.9	6.2
Wholesale/Motor Vehicle Sales/Repair	8.8	9.4	10.2	9.5
Retail/Hotels/Restaurants	20.3	24.4	49.4	31.2
Financing/Insurance/Real Estate	5.7	6.2	2.4	4.9
Business Services	20.9	21.2	7.2	16.8
Health/Education/Social Services	4.7	6.1	3.2	4.9
Consumer Services	6.4	6.3	5.1	6.0
	100.0	100.0	100.0	100.0

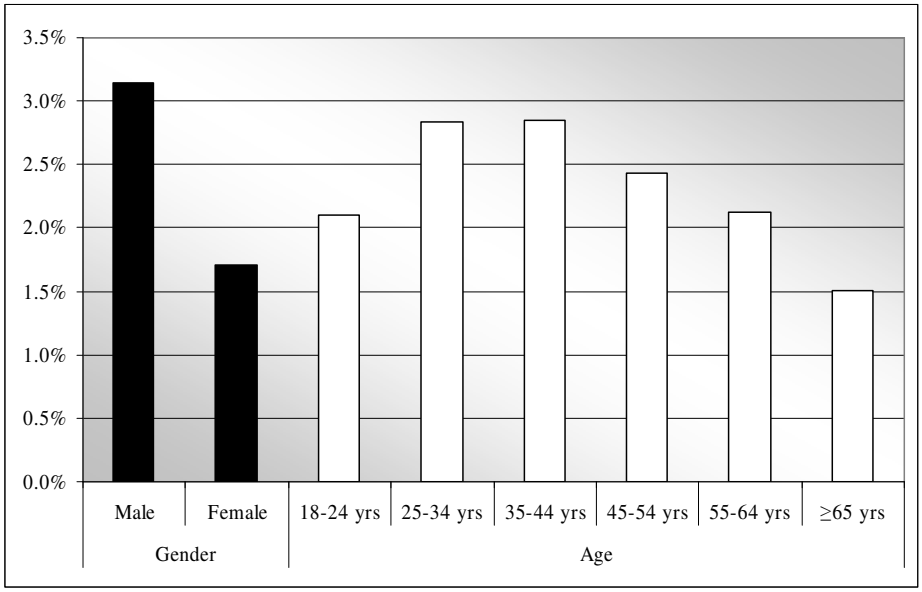
Note: The sector of the investee firm is available for 8,105 of the total of 8,554 informal investors.
Source: GEM Adult Population Survey

Demographic characteristics of informal investors

We now take a closer look at the demographic characteristics of informal investors. Figure 3 shows that the business angel rate is higher for men than for women. We also see that informal investors are overrepresented in the age categories between 25 and 44 years. It can be seen from Figure 4 that, in general, female informal investors are much more reticent than males regarding investments in firms of people other than close family members. To the contrary, males are inclined to invest more often in firms of a work colleague, a friend/neighbour or a 'stranger with a good business idea', especially in rich countries.

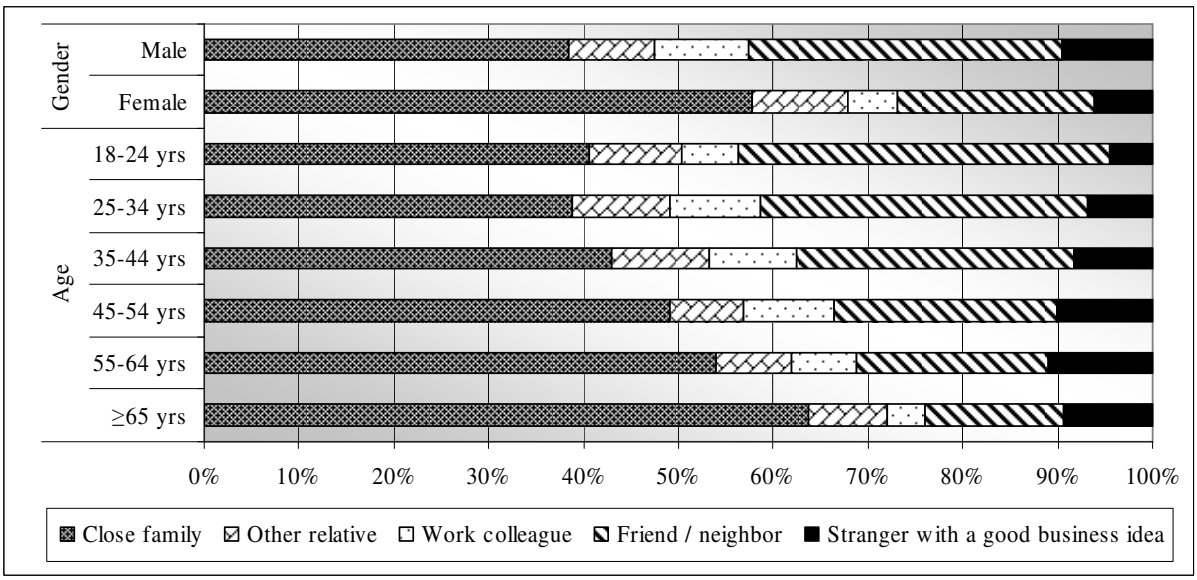
We also compare the relationship of the informal investor to the investee among all age categories. This reveals that informal investors aged 55-64 and 65 or older are most likely to invest in firms of a close family member (54.0% and 63.8% resp.). In addition, informal investors that are most likely to invest in firms of a stranger are in the age category 55-64 (11.0%), 45-54 years (10.2%), or 65 or older (9.3%). By contrast, informal investors with an age between 18 and 44 years are most likely to invest in firms of a friend or neighbour, a work colleague or another relative. Thus, while individuals between 25 and 44 years of age are more likely to be an informal investor, those of age of 45 years or higher are more likely to invest in firms of a close family member or of a stranger. See Figure 4.

Figure 3. Percentage of informal investors in adult population, by gender and age (all countries)



Source: GEM Adult Population Survey

Figure 4. Relationship of business angel to investee, by gender and age (all countries)



Source: GEM Adult Population Survey

4. Research approach

As we have seen informal investors in highly and lowly developed countries have different characteristics. Informal investors in lowly developed countries are more numerous but they invest less on average. Furthermore, they are less inclined to invest in a firm of a stranger, compared to informal investors in higher developed countries. They also invest in different sectors. Because of these differences it is not unlikely that the determinants of business angel prevalence are also different, hence estimation of an econometric model should be performed separately for samples of high and low developed countries. Unfortunately, the number of observations for the less developed countries is too small, due to missing observations (in particular for certain con-

trol variables). Therefore we focus on the more highly developed countries. Of the 364,843 observations for all 45 countries, 299,284 observations belong to the 28 higher developed countries (see Table 1). Among this number there are 6,369 informal investors (2.1%). The number of observations in the estimation samples is smaller however, due to missing data for several of the micro and macro variables. In particular, of the countries listed in Table 1, data for one or more of the macro-economic variables are missing for Hong Kong, Korea, Taiwan and Portugal so that these four countries are not included at all in the estimation samples. Our estimation sample includes 175,162 valid observations, 136,178 (38,984) of which belong to countries with a low (high) opportunity TEA rate. These observations are distributed over 24 countries.

We estimate a multinomial logit model explaining the prevalence of (pure) business angels investing in a firm of a stranger, and the prevalence of informal investors investing in a firm of a friend or family member[7], relative to the base category of not being an informal investor. The models are estimated for the whole sample (all highly developed countries) as well as for samples of static and dynamic countries (i.e. countries with a relatively low and high level of opportunity-based entrepreneurship) separately. Finally we also estimate a logit model focusing on the mode of informal investor prevalence only. This sample uses data for informal investors only.[8]

5. Estimation results

Table 4 presents the results of a multinomial logit model using data for all highly developed countries in our data base (see Table 1). It follows from the highly significant and positive parameter estimates for the first six micro-level variables that people who are/have been involved in entrepreneurship in any form – whether currently running a business, currently trying to start a business, planning to start a business in the near future, recently having shut down a business, etcetera – have a higher probability of being an informal investor. These results are broadly in line with hypotheses 3 and 4, but they do not – with the exception of the entrepreneurial skills variable – support hypothesis 1. Concerning the variable 'have you recently shut down your own business', the estimated coefficients are in line with hypothesis 4 (entrepreneurial capital accumulation school of thought), but not with hypothesis 3 (HRM-Labor economics school of thought). Thus, from an economic performance perspective, entrepreneurial activity whether ongoing or having resulted in exit appears to boost the supply of informal investors.

Concerning the TEA opportunity rate, we find a significantly positive effect for the TEA opportunity rate for the probability of being a 3 FFF investor but we do not find an effect on the probability of being a pure business angel. Hence, hypothesis 2a is partially supported. The effect for VCI per capita is not significant. However, in line with hypothesis 2b, we will see later, the distinction between high and low entrepreneurially active markets is necessary to separate out potential offsetting effects in order for this variable to show its true effects.

Furthermore, when focusing on the demographic characteristics of informal investors, males are more likely to be a business angel than females as the effect of gender (1=male, 2=female) is negative. As far as the age of a business angels is concerned, it seems that older people have a significant larger probability of informally investing in a firm of a stranger than people in the youngest age cate-

[7] This class is an aggregate of the four categories 'close family member', 'some other relative, kin or blood relation', 'work colleague' and 'friend or neighbor', as identified in the GEM survey.

[8] For this estimation we also control for sector of investment . Note that this is not possible in the normal business angel prevalence regressions, because individuals who are no business angel –by definition– have no sector to invest in.

gory (the base category). We also see that higher educated individuals are more likely to be informal investors.

Focusing on the controls at the macro level, it can be seen from Table 4 that per capita income positively affects the probability of being a business angel. Citizens in relatively higher income developed countries are more likely to be an informal investor than citizens in lower income developed countries. The effect of a country's interest rate on the decision to invest informally is somewhat remarkable. It turns out that a higher interest rate increases the probability of being an informal investor. A possible explanation for this is a substitution effect between loan and equity finance. A higher cost of borrowing increases the appeal of equity finance and hence raises the demand for informal finance. This also increases the bargaining power of business angels and the 3 FFFs when dealing with entrepreneurs. Economic growth seems to have no impact on the probability of investing in a firm of a friend or family member, but a negative impact on the probability of investing in a firm of a stranger. This is a little puzzling and may be due to a competition effect associated with good alternative investment opportunities in the corporate sector (financial markets), the housing market and other markets where returns are positively related to economic growth.

INSERT TABLE 4

Results for the micro level determinants in Tables 5a and 5b are in line with the results found in Table 4 – they are all significantly positive. Hence, the broad support for hypotheses 3 and 4 over hypothesis 1 are valid independent of the type of market – high or low levels of opportunity entrepreneurial activity. The results also provide much support for hypothesis 2b as the most remarkable difference between Tables 5a and 5b is that for markets with low levels of entrepreneurial activity, the effect of VCI per capita on the probability of being a business angel is much weaker compared to the effect for markets with higher levels of entrepreneurship. The coefficient of VCI for informal investment in the category 3 FFFs is non-significant for low opportunity TEA markets and positive and highly significant for high opportunity TEA markets. As regards the coefficient for more pure business angel investors, the coefficient for high opportunity TEA is more than twice as high as the coefficient for low opportunity TEA markets (15.5 versus 6.8). In line with hypothesis 2b these results appear to indicate that the degree to which VC and informal investment activities are complements (as opposed to substitutes) is positively related to the level of entrepreneurial activity in the market.

INSERT TABLE 5A AND 5B

Table 6 focuses on the mode of informal investment. For the subsample of informal investors we investigate what determines the choice for investment in a firm of a friend or family member (3 FFF) or (business angel) investment in the firm of a stranger. We see that of the entrepreneurship-related variables only one has a significant impact so that in general the factors that promote 3 FFF informal investment also promote business angel informal investment. However, one difference is that people who are currently the owner/manager of a business, have a higher probability of investing in a firm of a stranger. In other words, given that they are also informal investors, people who actually run a business are more likely to be *pure* business angels compared to 3 FFFs investors. This may be due to both supply and demand factors. If any of friends and family are involved in the current business then there are less opportunities for 3 FFF investment. Correspondingly, if substantial entrepreneurial capital accumulation has occurred in the current business then the entrepreneur may be encouraged to invest in more ambi-

tious projects and hence drawn more formally into business angel style investment in businesses owned by strangers. Again, the results seem to reject hypothesis 1 in favor of hypothesis 4.

In Table 6 we also see that, in markets with low opportunity TEA, women are less likely to be business angels. Instead they are more likely to invest in a firm of a friend or family member (3 FFFs). For high opportunity TEA markets this gender effect is not significant. For low opportunity TEA markets we also see that older investors are more likely to invest in the firm of a stranger.

High educated people have a larger probability of being an informal investor relative to people with a low level of education (see Tables 5a and 5b), and this effect applies to both informal investment of the 3 FFF and pure business angel variety, but they do not have a preference with respect to their investment in a firm of family/friends or that of a stranger (see Table 6).

INSERT TABLE 6

Overall, at the micro level we find that if an individual is involved in entrepreneurial activity, this has a positive effect on the probability of this individual becoming an informal investor. We find this effect broadly carries for both the 3 FFFs and more pure business angel investment types. These results do not support the classical notion of individuals being constrained in their choice by limited endowments of time and money. By contrast the results lend strongest support to entrepreneurial capital accumulation school of thought which indicates that entrepreneurial activity helps individuals to accumulate (as opposed to exhaust as the classical school predicts) skills and resources necessary for informal investment activity. In terms of macro variables the results indicate that higher levels of entrepreneurial activity have a positive effect by encouraging more people to become informal investors (most likely by creating a supply of investment opportunities for informal investors). This lends support for the Keynesian hypothesis that an increase in the demand for informal investment (as a result of increased entrepreneurial activity) will generate its own supply (of informal investors). We also find support for an indirect macro effect where higher levels of entrepreneurial activity increase the extent to which VCs and informal investors/business angels operate as complements rather than substitutes. In sum, the results indicate that concern over market failure associated with an enterprise equity gap may be overstated as we uncover dynamic relationships which help ameliorate this problem. We unearth a virtuous circle relationship between entrepreneurship and informal investment activity which appears to indicate that natural market forces will ensure that entrepreneurial activity and the number of informal investors seeking to invest in these businesses work positively in tandem with one another – thereby reducing scope for market failure of the type associated with enterprise equity gaps.

6. Conclusion

Informal investors (including business angels and the 3 FFFs – friends, fools and family) provide venture finance to entrepreneurs in a key area often associated with equity gaps – namely, early stage finance that is either too risky, too early stage and/or too small an amount of money to fit the profile of investments normally sought by venture capitalists. This investment is frequently informal, undocumented and hence far less researched than venture capital. In this paper we sought to shed more light on what determines the supply of business angels and hence a key type of finance necessary for entrepreneurs.

We investigated the impact of both macro and individual level factors determining the probability that an individual will become an informal investor. At the level of the individual we identify four schools of thought and associated hypotheses indicating how past, present and future entrepreneurial activity is likely to influence the probability of a person becoming a business angel. The results indicate that in general for most individuals these activities are complementary rather than competing. Our results indicate that the attributes of successful business angels – namely, wealth (finance to invest), entrepreneurial management skills (helping ventures with innovation and entrepreneurial strategy as well as small business management), reputation (in order to attract other co-investors and other resource providers to back target investments/ventures) and the ability to spot profit opportunities (either based on past success or from the lessons learnt from failure, i.e. the 'school of hard knocks') - can be fostered by the learning by doing, wealth creation and reputation enhancement when one is involved in entrepreneurship. We argue that if these effects are sufficiently strong then, notwithstanding the presence of time and wealth constraints, they lead to a net positive effect on the supply of business angels.

Our second strand of investigation relates to the impact of macro influences where we argue that a high level of entrepreneurial activity is likely to generate sufficient critical mass (including clusters, networks and knowledge spillovers) to generate increasing returns to scale in terms of the availability of new venture investment opportunities. The same conditions draw forth a more optimal scale and integrated venture finance industry i.e. with established exit paths for business angels including venture capital investment and co-exits with venture capitalists. Since business angel and 3 FFF investment is very early stage (in fact the earliest stage of external equity finance) the existence of later stage venture capital and associated exit routes can increase both the growth and liquidity potential of business angel investment. Therefore, we hypothesise that countries with higher levels of entrepreneurial activity are likely to have greater availability of follow on venture capital finance and exit opportunities. This makes venture capital and informal investors operate as complements rather than substitutes. Therefore, we hypothesise that a positive relationship between venture capitalists and business angels may exist and that this is stronger in more entrepreneurially active economies.

The evidence supported this perspective. We find a substantial positive effect of the extent of the formal venture capital (VC) market on the probability of becoming an informal investor for dynamic economies with high levels of entrepreneurial activity, but a much smaller impact for static (low entrepreneurial activity) economies. This is consistent with our view that in highly active entrepreneurial economies more individuals are willing to engage in informal investment because the presence of an established VC industry provides follow on investment (potential exit and/or boost firm growth/value) as well as opportunities to exit using the same routes and occasions as venture capitalists. In other words, business angels/3 FFFs and venture capitalists work as complements on a well developed and integrated venture finance supply chain. By contrast, in economies with low levels of entrepreneurial activity, there are less investment opportunities so that venture capitalists and business angels are more likely to find themselves in competition more often. This outcome is also likely to be exacerbated by the fact that a less developed venture finance industry in countries with lower levels of entrepreneurial activity is likely to mean a less developed and integrated venture finance supply chain. In sum, in less entrepreneurially active economies the formal and informal venture capital markets appear to act as substitutes while in dynamic more highly entrepreneurial economies they appear to operate as complements.

Overall, the results provide a richer picture of the determinants of the supply of a crucial form of finance in any entrepreneurial economy. The results uncover a positive virtuous circle where the demand for business angel finance tends to generate its own supply as a result of micro and macro factors. This appears to indicate that short term equity gaps – caused by excess demand for venture finance by entrepreneurs – may to some degree be ameliorated automatically by natural market forces. However, we also find that higher levels of entrepreneurial activity in-

crease the probability that venture capital and business angel finance work in tandem with one another as complements rather than substitutes. Overall, the results uncover some important new relationships that perhaps provide some good news that market forces to some extent appear to naturally ameliorate equity gaps faced by entrepreneurs.

References

Audretsch, D.B. and M.P. Feldman (2004). Knowledge Spillovers and the Geography of Innovation, in: J.V. Henderson and J.-F. Thisse (eds.), *Handbook of Regional and Urban Economics*, *Volume 4: Cities and Geography*. Amsterdam: Elsevier B.V., 2713-39.

Bhide, A.V. (2000). *The Origin and Evolution of New Businesses,* New York: Oxford University Press.

Birley, S. (1985). The Role of Networks in the Entrepreneurial Process, *Journal of Business Venturing*, 1, 107-117.

Birley, S. (2002). Universities, Academics and Spin Out Companies: Lessons from Imperial, *International Journal of Entrepreneurship Education*, 1(1), 133-154.

Berger A. and G. Udell (1990). Collateral, Loan Quality and Bank Risk, *Journal of Monetary Economics*, 25, 21-42.

Blanchflower, D. and A. Oswald (1998). What makes an entrepreneur? *Journal of Labor Economics*, 16, 26-60.

Burke, A.E. (1997). Small firm start-up by composers in the recording industry, *Small Business Economics*, 9(6), 463-471.

Burke, A.E., FitzRoy, F.R. and M.A. Nolan (2000). When less is more: distinguishing between entrepreneurial choice and performance, *Oxford Bulletin of Economics and Statistics*, 62, 565-587.

Burke, A.E. and A. Hanley (2003). How do Banks Pick Safer Ventures? A Theory Relating the Importance of Risk Aversion and Collateral to Interest Margins and Credit Rationing, *Journal of Entrepreneurial Finance and Business Ventures*, 8(2), 13-24.

Burke, A.E. and A. Hanley (2006). Bank Interest Margins and Business Start-up Collateral: Testing for Convexity, *Scottish Journal of Political Economy*, 53(3), 319-334.

Bygrave, W., M. Hay, E. Ng and P. Reynolds (2003), Executive Forum: A Study of Informal Investing in 29 Nations Composing the Global Entrepreneurship Monitor, *Venture Capital* 5(2), 101–116.

Campbell, K. (2003), *Smarter Ventures: A Survivors Guide to Venture Capital Through the Cycle*, London: FT Prentice Hall.

De Meza, D. and C. Southey (1996), The Borrower's Curse: Optimism, Finance and Entrepreneurship, *Economic Journal*, 106, 375-86.

De Meza, D. and D. Webb (1987), Too Much Investment: A Problem of Asymmetric Information, *Quarterly Journal of Economics*, 102, 281-292.

Evans, D. and B. Jovanovic (1989), An Estimated Model of Entrepreneurial Choice under Liquidity Constraints, *Journal of Political Economy*, 97(4), 519-535.

Fraser, S. and Greene, (2006), The Effects of Experience on Entrepreneurial Optimism and Uncertainty, *Economica*, 73, 169-365.

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

Harrison, R. and Mason, C. (1996), Developments in the promotion of informal venture capital in the UK, *International Journal of Entrepreneurial Behavior and Research*, 2(2), 6-33.

Harrison, R. and Mason, C. (2000), Venture capital market complementarities: the links between business angels and venture capital funds in the United Kingdom, *Venture Capital*, 2(3), 223-242.

Hindle, K., and Wenban, R. (1999). Australia's informal venture capitalists: An exploratory profile, *Venture Capital*, 1, 169-71.

Jovanovic, B. (1982). Selection and the Evolution of Industry, *Econometrica*, 50(3), 649-70.

Kelly, P. (2007). Business angel research: the road travelled and the journey ahead, in: H. Landstrom (ed.), *The Handbook of Research on Venture Capital*, Cheltenham, UK: Edward Elgar.

Keynes, J.M. (1936), *General Theory of Employment, Interest and Money*, New York: Harcourt, Brace and Company.

Knight, F.H. (1921), *Risk, Uncertainty and Profit*, Boston, MA: Houghton Mifflin.

Landström, H. (1998), Informal Investors as Entrepreneurs, *Technovation*, 18(5), 321-333.

Marshall, A. (1890), *Principles of Economics*, London: Macmillan and Company, 1920.

Mason, C., and R. Harrison (2000), Informal venture capital and the financing of emergent growth businesses, in Sexton, D., Landström, H. (eds.), *Handbook of Entrepreneurship*, Oxford, UK: Blackwell Publishers, 221-239.

Maula, M., Autio, E., and Arenius, P. (2005), What drives micro-angel investments? An examination of determinants of family and non-family investments, *Small Business Economics*, 25(5), 459-475.

Minniti, M., Bygrave,W. (2001), A dynamic model of entrepreneurial learning, *Entrepreneurship Theory & Practice*, 25(3), 5–16.

Minniti, M., W.D. Bygrave and E. Autio (2006), *Global Entrepreneurship Monitor, 2005 Executive Report*, Wellesley, MA, and London, UK: Babson College and London Business School.

Nelson, R. and S. Winter (1982), *An Evolutionary Theory of Economic Change*, Cambridge, MA: Harvard University Press.

Riding, A.L., Madill, J.J., and G.H. Haines jr, (2007), Investment decision making by business angels, in: H. Landstrom (ed.), *The Handbook of Research on Venture Capital*, Cheltenham, UK: Edward Elgar, 332-346.

Romer, P.M. (1994), The Origins of Endogenous Growth, *Journal of Economic Perspectives*, 8(1), 3-22.

Smith, A. (1776), *Inquiry into the Nature and Causes of the Wealth of Nations*, Chicago, IL: University of Chicago Press, 1976.

Sohl, J. (1999), The early stage equity capital market in the USA, *Venture Capital*, 1(2), 101-120.

Sohl, J. (2003), The private equity market in the USA: lessons from volatility, *Venture Capital*, 5(1), 29-46.

Szerb, L., Terjesen, S., and G. Rappai (2007), Seeding new ventures - green thumbs and fertile fields: Individual and environmental drivers of informal investment, *Venture Capital*, 9(4), 257–284.

Taylor, M., (2001). Self-Employment and Windfall Gains in Britain: Evidence from Panel Data, *Economica*, 68, 539-565.

Table 4. Parameter estimates of a multinomial logit model for highly developed countries

Model	: Multinomial Logit
Dependent variable	
Category 0	: No business angel (base category)
Category 1	: Business angel in firm friend/family
Category 2	: Business angel in firm stranger
Method	: Maximum Likelihood
Effective sample	: 175,162 observations

	Business angel investing in firm of friend/family		Business angel investing in firm of stranger	
	Coefficient	Std. error	Coefficient	Std. error
Regressors				
intercept	-5.702***	0.233	-7.856***	0.699
you are currently the owner/ manager of a business	0.554***	0.040	1.227***	0.105
you are currently trying to start a new business	0.316***	0.050	0.323**	0.130
you expect to start a new business within the next 3 years	0.669***	0.043	0.774***	0.116
you are currently trying to start a new business – on behalf of your employer	0.653***	0.060	0.621***	0.149
you recently shut down your own business	1.050***	0.057	0.977***	0.153
you have the skills required to start a new business	0.776***	0.040	0.722***	0.131
Macro level				
TEA opportunity rate	0.053***	0.017	0.014	0.052
VCI per capita (x 1000)	0.207	0.746	3.505	2.362
Controls				
Micro level				
Gender (1=male, 2=female)	-0.242***	0.036	-0.636***	0.113
Age				
18-24 yrs (base category)				
25-34 yrs	-0.197***	0.064	0.149	0.212
35-44 yrs	-0.063	0.062	0.204	0.205
45-54 yrs	-0.136**	0.064	0.236	0.210
55-64 yrs	0.000	0.067	0.449**	0.213
≥ 65yrs	0.106	0.073	0.335	0.243
Education				
low (base category)				
middle	0.093*	0.048	-0.342**	0.144
high	0.354***	0.047	0.436***	0.131
Macro level				
gdp per capita (x 1000)	0.016**	0.007	0.047*	0.024
gdp growth	0.022	0.014	-0.226***	0.045
interest rate	0.083***	0.010	0.077***	0.027

Note: * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.
Year and continent of country dummies included but not reported.

Table 5a. Parameter estimates of a multinomial logit model for highly developed countries with a low opportunity TEA (i.e. static markets)

Model	: Multinomial Logit
Dependent variable	
Category 0	: No business angel (base category)
Category 1	: Business angel in firm friend/family
Category 2	: Business angel in firm stranger
Method	: Maximum Likelihood
Effective sample	: 136,178 observations

	Business angel investing in firm of friend/family		Business angel investing in firm of stranger	
	Coefficient	Std. error	Coefficient	Std. error
Regressors				
intercept	-5.706***	0.425	-10.718***	2.262
you are currently the owner/ manager of a business	0.526***	0.051	1.252***	0.133
you are currently trying to start a new business	0.390***	0.068	0.377**	0.165
you expect to start a new business within the next 3 years	0.698***	0.056	0.957***	0.145
you are currently trying to start a new business – on behalf of your employer	0.837***	0.082	0.647***	0.192
you recently shut down your own business	1.096***	0.074	1.154***	0.186
you have the skills required to start a new business	0.811***	0.049	0.713***	0.160
Macro level				
VCI per capita (x 1000)	-1.129	0.863	6.789**	3.015
Controls				
Micro level				
Gender (1=male, 2=female)	-0.231***	0.044	-0.736***	0.141
Age				
18-24 yrs (base category)				
25-34 yrs	-0.069	0.081	0.374	0.271
35-44 yrs	0.021	0.078	0.458*	0.264
45-54 yrs	-0.019	0.082	0.374	0.273
55-64 yrs	0.087	0.084	0.616**	0.276
≥ 65yrs	0.171*	0.093	0.454	0.315
Education				
low (base category)				
middle	0.042	0.056	-0.162	0.164
high	0.314***	0.056	0.359**	0.158
Macro level				
gdp per capita (x 1000)	0.019	0.012	0.119*	0.063
gdp growth	0.010	0.019	-0.312***	0.077
interest rate	0.099***	0.014	0.202***	0.059

Note: * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.
Year and continent of country dummies included but not reported.

Table 5b. Parameter estimates of a multinomial logit model for highly developed countries with a high opportunity TEA (i.e. dynamic markets).

Model	: Multinomial Logit
Dependent variable	
Category 0	: No business angel (base category)
Category 1	: Business angel in firm friend/family
Category 2	: Business angel in firm stranger
Method	: Maximum Likelihood
Effective sample	: 38,984 observations

	Business angel investing in firm of friend/family		Business angel investing in firm of stranger	
	Coefficient	Std. error	Coefficient	Std. error
Regressors				
intercept	-6.033***	0.653	-6.084***	1.965
you are currently the owner/ manager of a business	0.604***	0.064	1.179***	0.183
you are currently trying to start a new business	0.185**	0.075	0.116	0.230
you expect to start a new business within the next 3 years	0.645***	0.068	0.514**	0.204
you are currently trying to start a new business – on behalf of your employer	0.451***	0.088	0.526**	0.251
you recently shut down your own business	1.008***	0.089	0.731**	0.289
you have the skills required to start a new business	0.724***	0.072	0.690***	0.242
Macro level				
VCI per capita (x 1000)	10.922***	2.167	15.494**	6.192
Controls				
Micro level				
Gender (1=male, 2=female)	-0.241***	0.060	-0.459**	0.201
Age				
18-24 yrs (base category)				
25-34 yrs	-0.413***	0.108	-0.155	0.354
35-44 yrs	-0.216**	0.101	-0.200	0.346
45-54 yrs	-0.346***	0.104	0.051	0.345
55-64 yrs	-0.167	0.111	0.223	0.351
≥ 65yrs	-0.065	0.118	0.128	0.399
Education				
low (base category)				
middle	0.220**	0.096	-0.516	0.341
high	0.433***	0.089	0.617**	0.267
Macro level				
gdp per capita (x 1000)	0.009	0.014	-0.043	0.046
gdp growth	0.136***	0.042	0.106	0.138
interest rate	0.118***	0.027	0.121	0.080

Note: * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.
Year and continent of country dummies included but not reported.

Table 6. Parameter estimates of a binomial Logit model within the group of business angels for highly developed countries, high and low opportunity TEA markets

Model	: Binomial Logit	
Dependent variable		
Category 0	: Business angel in firm friend/family (base category)	
Category 1	: Business angel in firm stranger	
Method	: Maximum Likelihood	
Effective sample	: 2,638 observations (low TEA)	1,510 observations (high TEA)

	Countries with a low opportunity TEA (static)		Countries with a high opportunity TEA (dynamic)	
	Coefficient	Std. error	Coefficient	Std. error
Regressors				
intercept	-7.146***	2.004	0.290	2.113
you are currently the owner/ manager of a business	0.777***	0.143	0.572***	0.191
you are currently trying to start a new business	0.018	0.185	-0.024	0.231
you expect to start a new business within the next 3 years	0.224	0.160	-0.167	0.211
you are currently trying to start a new business – on behalf of your employer	-0.147	0.220	0.007	0.259
you recently shut down your own business	0.155	0.204	-0.164	0.284
you have the skills required to start a new business	-0.016	0.162	-0.026	0.237
Macro level				
VCI per capita (x 1000)	6.894**	2.970	3.781	6.474
Controls				
Micro level				
Gender (1=male, 2=female)	-0.525***	0.149	-0.189	0.193
Age				
18-24 yrs (base category)				
25-34 yrs	0.453	0.282	0.305	0.359
35-44 yrs	0.410	0.275	0.038	0.347
45-54 yrs	0.470*	0.285	0.437	0.344
55-64 yrs	0.608**	0.287	0.424	0.359
≥ 65yrs	0.211	0.323	0.148	0.402
Education				
low (base category)				
middle	-0.187	0.177	-0.751**	0.328
high	0.045	0.168	0.106	0.268
Macro level				
gdp per capita (x 1000)	0.150***	0.057	-0.056	0.045
gdp growth	-0.194**	0.079	-0.061	0.136
interest rate	0.161***	0.056	-0.010	0.084

Note: * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.
Sector, year and continent of country dummies included but not reported.

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