

What Drives Micro-Angel Investments?

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ABSTRACT. Despite of the significant role of informal venture capital in the financing of new entrepreneurial ventures, there is little research explaining the factors determining the propensity of individuals to make micro-angel investments. Building on two theoretical frameworks, a social psychological theory of planned behavior and an economic theory on the determinants of demand for risky assets in household portfolios, we develop a set of hypotheses predicting the propensity of individuals to make informal investments in new businesses owned by others. In our analysis we test whether the determinants of micro-angel investments are similar when investing in a business owned by a close family member versus more distant business. The hypotheses are tested using data from 6007 interviews of Finnish adults carried out in the Global Entrepreneurship Monitor program in 2000–2002. The findings show that the theoretical frameworks have more power in explaining investments in firms not owned by close family members. The study provides new understanding of the differences in the drivers of different types of micro-angel investments.

KEY WORDS: household portfolios, informal venture capital, theory of planned behavior

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1. Introduction

Informal venture capital including micro-angel investments has been found to be a major source of funding for early-stage entrepreneurial ventures (Mason and Harrison, 2000a,b; European Commission, 2002; Reynolds et al., 2002a; Bygrave et al., 2003). In comparison to formal venture capital allocated for start-up activities (US\$59 billion), informal funding provided to new firms was five times greater (US\$298 Billion) in 2001 for the 37 countries included in the Global Entrepreneurship Monitor research in 2002 (Reynolds et al., 2002a). Whereas the share of new companies receiving formal venture capital funding was only about one in 10,000, informal funding, on the other hand, was provided by 1–7% of the adult population to tens of millions of individuals involved in the start-up process according to the Global Entrepreneurship Monitor research (Reynolds et al., 2002a). To put it in economic perspective, whereas the volume of formal venture capital investment was 0.2% of GDP, the estimated share of informal investment was 1% of GDP in 2001 on average in the 37 countries participating in the Global Entrepreneurship Monitor (Reynolds et al., 2002b).¹

Despite of the significant role of informal venture capital in the financing of small and new ventures, there is little theory-driven research focusing on the determinants of the propensity of individuals to make informal investments in businesses owned by others (Wright et al., 1998; Mason and Harrison, 2000a). In our research, we contribute to the understanding of drivers of informal investments by drawing on two theoretical frameworks, the social psychological theory of planned action (Ajzen, 1991), and the economic theory on household portfolios (Guiso et al., 2002b) to develop a set of hypotheses pre-

dicting the propensity of individuals to make informal investments in new businesses owned by others. Further, we compare the determinants of investments in businesses owned by close family members and investments made in businesses owned by more distant entrepreneurs. In our research, we are able to leverage a unique, large, and comprehensive data set, which has not been previously employed in research on informal venture capital. The hypotheses are tested using data from 6007 interviews of Finnish adults carried out in the Global Entrepreneurship Monitor program in 2000–2002.

The rest of the paper is structured as follows. We first introduce the two bodies of literature to which this study contributes. We then lay out our hypotheses. This is followed by the method section and empirical analyses. Finally, we discuss our findings and the implications for various stakeholders.

2. Literature review

Despite of the significant role of informal venture capital in the financing of small and new ventures, there is little research on what influences micro-angel investments (Wright et al., 1998; Mason and Harrison, 2000a). The first generation of studies on informal venture capital have typically been descriptive (For a review, see e.g. Mason and Harrison, 2000a), focusing primarily on investor characteristics, investment activity, information channels, and involvement in investee companies in different countries including USA (Wetzel, 1981; Aram, 1989; Freear et al., 1994), UK (Harrison and Mason, 1992; Stevenson and Coveney, 1994), Sweden (Landström, 1993), Canada (Short and Riding, 1989; Riding et al., 1993; Farrell, 1998;), Finland (Lumme et al., 1996; 1998), Japan (Tashiro, 1999), Australia (Hindle and Wenban, 1999), Norway (Reitan and Sørheim, 2000), and Singapore (Hindle and Lee, 2002). It is common for these studies that they have estimated the size of the informal venture capital market to be multiple times the size of the formal venture capital market. These studies have also frequently profiled a typical angel investor as a high-worth middle-aged male with entrepreneurial experience.

Recently, research on informal venture capital has started to shift from descriptive studies to more theory-based studies and studies employing improved empirical methods to solve problems stemming from the limited availability of data on informal venture capital (Mason and Harrison, 2000a,b). However, the evolving research has not yet focused on the determinants of the propensity of individuals to make informal investments in new businesses started by others. Given that prior research clustering informal investors in groups driven either on economic or various types of social psychological factors (Sullivan and Miller, 1996), we build our research on two important theoretical bases. First, we employ the social psychological theory of planned behavior (Ajzen, 1991), which attempts to explain the influence of (a) individuals attitudes towards a behavior (i.e. the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question), (b) perceived social norms (i.e. the perceived social pressure to perform or not to perform the behavior), and (c) perceived behavioral control (i.e. the perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles) on intentions and subsequent behavior. Given that an informal investment should often be preceded by some form of planning and decision-making (in particular in non-family investments), this framework should be useful in explaining part of the variance in informal investment activity. Second, we employ the economic theory of household portfolios (Guiso et al., 2002b), which attempts to explain the determinants of demand for risky assets in household portfolios. Given that an investment into a new start-up attempt clearly classifies as a risky asset (even if it is not always considered as such), this framework should be useful for our purposes and help to explain part of the variance in informal investment activity.

In social psychology, the theory of planned behavior (Ajzen, 1991) has been found to provide a strong basis for explaining the intentions of individuals to perform behaviors that require some kind of premeditation. The theory and related empirical research has shown that such

intentions can be explained with the individual's own attitudes toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). These intentions, together with subjective perceptions regarding the individual's ability to control the outcome of her behaviors, have been found to account for considerable share of variance in the actual behavior. The framework has been successfully applied in a wide range of behaviors, such as voting in elections, quitting the smoking habit, and dieting. In empirical fields related to informal venture capital, the theory of planned behavior has been shown to explain well the relationship between growth intentions and realized growth of new ventures (Wiklund, 2001). Related to the concept of perceived behavioral control, perceived self-efficacy has been shown to be related to entrepreneurial intent (Krueger et al., 2000) and entrepreneurial decision (Chen et al., 1998). However, the theory of planned behavior and perceived self-efficacy have not been applied to the context of informal venture capital.

In economics, researchers have started to examine the factors influencing investments by households into risky assets such as shares and mutual funds (Guiso et al., 2002b). Some of the predictions from household portfolio theory, validated by empirical research, are that age, financial wealth and income, education, attitude to risk, stock market participation costs, and taxation are related to household investments in risky assets, and the allocation among different types of assets (Perraudin and Sorensen, 2000; Guiso et al., 2003, 2002b; Poterba and Samwick, 2003). While this research has identified several important determinants of household investments into risky assets, and developed sophisticated econometric methods to tackle the challenges related to survey data on household portfolios, this research has not considered informal investments into private companies.

Combined, these two bodies of social psychological and economic literatures should provide a good basis for explaining the determinants of the propensity of individuals to make informal investments into private companies. In the following, we will draw on these two frameworks to predict informal investment into new start-up companies by individual investors.

3. Hypotheses

In this chapter we develop 10 hypotheses concerning the determinants of informal investments. In developing these hypotheses, we distinguish between two types of informal investors: family investors and more distant investors. We compare the determinants of informal investments between these two groups. We predict that there is a difference in the strength on the predicted relationships depending on different types of investments, particularly when separating investments in companies owned by close family members from firms owned by more distant entrepreneurs. We expect that while investments in companies owned by more distant owners will be more frequently based on rational decision-making and driven by the determinants evoked in our theoretical model, investments in companies owned by close family members may be driven more by altruistic motivations and by the *need* to invest. For example, if a business operated by a close family member is in need of more capital, other family members will be more likely to provide funding regardless of the theoretical influences evoked in our model. Thus, we expect that our theoretical model will be more suited to explaining informal investments made by non-family members, as opposed to family members. Our empirical data enables us to verify the validity of this expectation.

3.1. Entrepreneurial experience

Following the logic of the theory on planned behavior (Ajzen, 1991), we expect that previous entrepreneurial experience should be positively related to the propensity to become an informal investor. An investment into a new start-up company requires assessment regarding the success potential of the company. In small start-up companies, individual investors are often also called to assist in key strategic decisions and moves. Previous entrepreneurial experience should improve the person's perception of her own ability to select good investment targets and to control these for optimal outcome. This perceived behavioral control should be associated with a stronger intent to make informal investments and with eventual investment decisions.

This expectation is corroborated by received empirical research: prior research on business angels has found that these typically have a background as an entrepreneur (Freear et al., 1994; Mason and Harrison, 2000a; Politis and Landström, 2002). Politis and Landström (2002) found in their qualitative research of informal investors in Sweden that informal investors have commonly experienced three overall career phases: the corporate career phase; the entrepreneurial learning phase; and the integrated investment career phase. In international studies of informal venture capital, the share of investors being company-owners has ranged from 38% in Norway (Reitan and Sørheim, 2000), 48% in Japan (Tashiro, 1999), 49% in UK (Harrison and Mason, 1992) to 69% in Sweden (Landström, 1993). In the same studies, the shares of informal investors having founding experience have been 46% in Norway, 67% in UK, and 96% in Sweden. We expect entrepreneurial experience to be a particularly important determinant of non-family investments. Therefore:

Hypothesis 1: There should be a positive relationship between individual's prior entrepreneurial experience and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

3.2. Skills to start a new business

Informal investments differ from most other investment classes in that the investor can often directly contribute to the performance of the investment target. While sometimes informal investment are made in syndicates in which some of the investors can remain passive, the overall evidence of the characteristics of informal investments indicates very high hands-on involvement expected from and provided by informal investors. Therefore, the stronger the person's belief that (s)he can make a positive contribution to the target, the greater should be her likelihood of making an informal investment (Ajzen, 1991). This logic is empirically supported by the study of Duxbury et al. (1996), who concluded that informal investors were intrinsically motivated, highly involved with their work and investments and

worked hard to guarantee their performance, suggesting that informal investment should be related to skills of setting up new ventures. We expect startup skills to be a particularly important determinant of non-family investments. Therefore, we hypothesize:

Hypothesis 2: There should be a positive relationship between individual's perceived startup skills and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

3.3. Available Opportunities

We believe that the perception of business opportunities should be associated with informal investment decisions for two reasons. First, perception of opportunity should reflect an individual's confidence in the economic climate. Second, perception of opportunity can work as a measure of the availability of deal flow in which to invest. Regarding the first, empirical studies on the "rational expectations" framework have shown that individuals' investment and buying decisions are strongly conditioned by the degree to which they have confidence in the general economic climate. Positive expectations about economic development would be reflected in greater perceived opportunity, which should be associated with a greater propensity to make informal investments. Regarding the second argument, finding attractive deals has been shown to be a key challenge in informal venture capital (Mason and Harrison, 1995, 2002a; Kelly and Hay, 2000). Lack of deals has often been claimed as a key barrier for increasing the supply of informal venture capital investment. For instance, Harrison and Mason (2002a) found that over 90% of informal investors would have been willing to invest more if there had been more high quality deals. Therefore, we hypothesize:

Hypothesis 3: There should be a positive relationship between individual's perception of good opportunities to start new businesses and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family investments.

3.4. *Knowing entrepreneurs personally*

Empirical studies emphasize the importance of vicarious experience for an individual's propensity to engage in entrepreneurial activity (Scherer et al., 1991; Delmar and Gunnarsson, 2000). In the context of informal investments, personal familiarity with entrepreneurs should be associated with more positive attitudes towards entrepreneurs, and consequently, a lower mental barrier toward investing in new start-up companies. In addition to influencing the attitude towards informal investments, knowing personally entrepreneurs is likely to influence the subjective norms concerning informal investments i.e. make it if not expected, at least accepted behavior. Knowing personally entrepreneurs is also likely to improve the perceived behavioral control over investments i.e. make one feel more capable of making and managing informal investments successfully. Conversely, prior research has also suggested that poor personal familiarity with entrepreneurs might act as a barrier for increased informal investment (Mason and Harrison, 2002a). On the other hand, personal familiarity with entrepreneurs is also a sign of potential availability of investment opportunities. Supporting this notion, Reynolds et al. (2002a,b) reported evidence that many informal investments are made in companies that have at least some pre-existing ties to the investors. Therefore, we hypothesize:

Hypothesis 4: There should be a positive relationship between individual's knowledge of entrepreneur(s) and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

3.5. *Risk aversion*

We have two reasons to expect that an individual's sensitivity to downside risk, measured in this study as the individual's fear of failure regarding possible start-up behaviors, should be negatively associated with informal investment activity. First, informal investments are typically considerably riskier than most other investment categories (Mason and Harrison, 2002b). The literature on household portfolios

has clearly shown that below-average willingness to take risk is negatively associated with investments in risky assets (Perraudin and Sorensen, 2000). Second, fear of failure associated with potential start-up attempts is also a sign of lower internal locus of control. Research on the psychological characteristics of informal investors suggests that informal investors have a greater internal locus of control and are therefore capable of taking risk (Duxbury et al., 1996). Summarizing, therefore, we expect that a risk aversion and a fear of failure should be negatively associated with informal investing:

Hypothesis 5: There should be a negative relationship between individual's fear of failure preventing entrepreneurial activity and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

3.6. *Education*

From the perspective of the theory of planned behavior, a high level of education is likely to be positively associated with perceived behavioral control and with belief in one's own capability to make successful investments. These should contribute to an increased propensity to make informal investments. Suggesting similar relationship, household portfolio theory predicts a positive association between the level of education and household investments in risky assets such as stocks (Guiso et al., 2003). Prior descriptive studies on the characteristics of informal investors are in line with these theories. According to prior studies, a typical investor is well educated (Freear et al., 1994; Mason and Harrison, 2000a). The prior studies on informal investors have found that in USA 82% had at least under-graduate degree (Aram, 1989), in Canada 30% had a university degree and 39% had a post graduate degree (Riding et al., 1993), in UK 74% had a university degree (Stevenson and Coveney, 1994), and in Finland 56% had a Masters degree and 8% had a Ph.D. (Lumme et al., 1996). Therefore, we expect:

Hypothesis 6: There should be a positive relationship between individual's level of edu-

cation and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

3.7. *Income*

Informal investment activity should be positively associated with wealth and household income. According to household portfolio theory, some of the most important determinants of investments household investments in risky assets are household financial wealth and income (Gollier, 2002; Guiso et al., 2002a, 2003). While informal investors invest from assets, not from income, wealth and income of individuals and households are usually highly correlated. Because of the lack of measures for wealth in our data, we focus on the household income in our analysis. A high level of income allows the individual to spread her assets more widely across investment categories, and therefore, also include riskier investment vehicles such as informal investments in her portfolio. At smaller levels of income, the downside risk associated with risky investments becomes prohibitive, thereby reducing investment in riskier vehicles. In line with these arguments, prior research on the characteristics of business angels has found that a business angels have typically a high net worth and income level (Harrison and Mason, 1992; Freear et al., 1994; Mason and Harrison, 2000a). Therefore, we predict:

Hypothesis 7: There should be a positive relationship between individual's income level and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

3.8. *Work status*

Echoing the notions of the rational expectations theory, the theory on household portfolios argues that a secure income is associated with the propensity to make risky investments (Gollier, 2002). Not only does a steady income contribute to the household's general wealth (a factor associated with riskier investments), a secure, continued income stream should also be associated with an individ-

ual's ability to sustain economic losses, should the risks materialize. Therefore, we predict:

Hypothesis 8: There should be a positive relationship between individual working full-time and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

3.9. *Gender*

Prior research examining the characteristics of informal investors has found that informal venture capital is a male dominated activity. In UK, Harrison and Mason (1992) found that 99 % of informal investors were men. This share is very similar to the one reported in Australia (Hindle and Wenban, 1999). In other countries, the share of men among informal investors has been found to be as high as 97% in Norway (Reitan and Sørheim, 2000) and Japan (Tashiro, 1999), 90% in Singapore (Hindle and Lee, 2002), and 85% in Canada (Farrell, 2000). In newer research focusing on more broadly defined informal investors, the shares of women investors have been found to be higher (30.1% in 29 nations of Global Entrepreneurship Monitor countries, 34.1% in USA, 32.2% in UK, and 24.1 in Germany), but still greatly under-represented when compared against the prevalence of women in the base population (Bygrave et al., 2003). Therefore, we predict:

Hypothesis 9: There should be a negative relationship between the female gender and the individual's propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

3.10. *Age*

We predict an inverted U-shaped relationship between individual's age and her propensity to make informal investments. On the one hand, according to the theory of planned behavior, very young individuals should have less belief in their ability to make informal investments in start-up companies, and they should also have less belief in their ability to contribute to the success of such

companies. On the other hand, very old individuals might have similar beliefs. The beliefs regarding the perceived control related to informal investment behavior should peak somewhere in between these two extremes. This expectation is corroborated by findings reported in research on household portfolios, where a curvilinear (inverted-U shaped) relationship has been predicted and empirically demonstrated between age and ownership of risky assets (Guiso et al., 2003, 2002b). In line with these predictions, prior research on informal venture capital has found that a typical business angel is middle-aged (Freear et al., 1994). The average age of informal investors has ranged from 40 year (median) in Australia (Hindle and Wenban, 1999), 42 or 47 in USA (Wetzel, 1981; Tymes and Krasner, 1983), 47 years in Norway (Reitan and Sørheim, 2000), 53 years in UK (Harrison and Mason, 1992), 54 years in Sweden (Landström, 1993) to 60 in Japan (Tashiro, 1999). In Finland, Lumme et al. (1996) found that 67% of the informal investors were between 40 and 60. Summarizing, we predict:

Hypothesis 10: There should be a curvilinear (inverted-U shaped) relationship between individual's age and her propensity to make informal investments. This relationship should be stronger in non-family investments compared to family-investments.

4. Data and methods

4.1. Data

To empirically test the predictions laid out above, we employed a unique and comprehensive interview dataset collected from 6007 Finns in 2000–2002 under the Global Entrepreneurship Monitor research program (Reynolds et al., 2002a).² The GEM adult population data is based on annual telephone surveys of 2000 or more adults representative of the Finnish adult population in 2000–2002 (Arenius et al., 2001). The telephone interviews were carried out by professional survey companies, on the basis of predefined survey questionnaires that aimed at tracking the individuals' entrepreneurial behaviors.³ According to the Global Entrepreneurship Monitor, the prevalence of informal venture capital investors in Finland

has been slightly above the average of GEM countries (Reynolds et al., 2002a).

4.2. Dependent variable

Family and nonfamily informal investor. The dependent variable is a categorical variable measuring whether the respondent has invested in a new business owned by someone else within last three years. The measure takes value zero if the respondent disagreed with a statement "You have, in the past three years, personally provided funds for a new business started by someone else – this would not include buying publicly traded shares or mutual funds" (Reynolds et al., 2001). If the respondent had made such investments, these investments were split in family and non-family investments on the basis of the most recent investment using a variable categorizing the relationship of the investor with the investee. This results in a dependent variable with three categories: 0 = Has not made informal investments; 1 = Has made informal investments in firm owned by a close family member; 2 = Has made informal investments in firm owned by other than a close family member.

4.3. Independent variables

Owner-manager is as a dummy variable. Value 1 is assigned to this variable if the respondent indicated that (s)he is an owner-manager in a company by agreeing with the following statement "You are, alone or with others, the owner of a company you help manage" (Reynolds et al., 2001).

Skills to start a new business is a dummy variable. Value 1 is assigned to this variable if the respondent agreed with a statement "You have the knowledge, skill, and experience required to start a new business" (Reynolds et al., 2001).

New business opportunities in region is a dummy variable that was given value 1 if the respondent agreed with a statement "In the next six months there will be good opportunities for starting a business in the area where you live" (Reynolds et al., 2001).

Knows an entrepreneur personally is a dummy variable that was given value 1 if the respondent agreed with a statement "You know someone

personally who started a business in the past two years” (Reynolds et al., 2001).

Fear of failure is a dummy variable that was given value 1 if the respondent agreed with a statement “Fear of failure would prevent you from starting a business” (Reynolds et al., 2001).

Education is a dummy variable that was given value 1 if the respondent had received university education and zero otherwise.

Household income is a dummy variable that was assigned value 1 if the household income was among top one third within the national household income distribution and zero otherwise. Note that a relative measure was used here, because it has been shown that individuals’ perceptions of wealth are formed on the basis of comparisons against prevailing economic standards.

Work Status is a dummy variable that was given value 1 if the respondent was employed full-time and zero otherwise.

Gender is a dummy variable that was assigned value 1 if the respondent was female and zero if the respondent was male.

Age is measured using age in years as well as age squared to enable testing of non-linear effects. The respondent’s age was calculated on the basis of her response to the question: “What year were you born?” – this approach has been found to be more accurate than a direct question inquiring an individual’s age.

Year dummies are used to control for macro-economic changes. The base year is 2002.

4.4. Analytical methods

Our dependent variable is a categorical variable indicating the choice of an individual to invest in independent, private companies owned by a close family member or by a more distant entrepreneur. In testing the hypotheses, we employ a multinomial logistic regression model to test the differences in the drivers of two different types of investments. Multiple logistic regression estimates simultaneous logistic regression model with pairwise comparisons of each functional category with the base category. The base category in our analyses was no informal investments. Therefore, the models estimate parameters of the predictor variables for the propensity of making informal

investments in (1) family firms versus not making informal investments; and (2) more distant firms versus not making informal investments. To test the hypotheses, we must consider not only the individual parameter estimates but also a comparison of parameter values across the equations estimated i.e. test the differences in the coefficients for the two types of investments.

In order to make the analyses representative of the population, sample weights were used in the regression analyses. Given missing values in some of the variables (on average 6.7% of observations in the 15 main variables used in the study) we employed regression-based imputation using to estimate the missing values on the basis of other independent variables.

5. Results

Table I provides descriptive statistics and correlations. The variables reflecting the hypothesized effects are not highly correlated among themselves suggesting that multicollinearity of variables should not be a problem in the analysis.

Table II provides descriptive analyses of family investors and other investors divided in different subgroups. Overall, nearly a third of the informal investors are owner-managers in a company, and nearly two thirds of them consider themselves having skills to start a new business. These descriptive figures give some evidence supporting the stereotype of a business angel. However, they do not yet tell what are the most important determinants affecting the propensity of individuals to make informal investments.

Table III provides the results for the multinomial regression analyses. Model 1 includes all the variables available for the whole sample of 6007 respondents. Model 2 adds the perceived startup skills variable, which is available only for years 2001–2002. Hypothesis 1 predicted a positive relationship between a status as an owner-manager in a company and the propensity to make informal investments. Supporting the hypothesis, the status as an owner-manager was positive and significant for non-family investors. According to models 1–2, the status as an owner-manager increases the propensity to make nonfamily investments on

TABLE I
Descriptive statistics

Variable	Mean	Min	Max	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Has made informal investments	0.03	0	1	6007	1.00														
2. Is an owner-manager in a company	0.12	0	1	6007	0.11	1.00													
3. Has skills to start a new business	0.35	0	1	3842 ^a	0.10	0.38	1.00												
4. Perceived new business opportunities in region	0.50	0	1	3710	0.04	0.02	0.07	1.00											
5. Knows personally an entrepreneur	0.45	0	1	5039	0.14	0.18	0.25	0.11	1.00										
6. Fear of failure preventing entrepreneurial activity	0.33	0	1	4763	-0.03	-0.14	-0.18	-0.06	-0.08	1.00									
7. Has university education	0.28	0	1	5787	0.01	-0.08	0.03	0.07	0.03	-0.03	1.00								
8. Household income among top one-third	0.34	0	1	5161	0.03	0.00	0.07	0.03	0.14	-0.08	0.15	1.00							
9. Is employed	0.54	0	1	5796	0.05	0.20	0.17	0.03	0.23	-0.04	0.10	0.37	1.00						
10. Is female	0.52	0	1	6007	-0.06	-0.10	-0.15	-0.04	-0.10	0.07	0.05	-0.09	-0.07	1.00					
11. Age	43.17	15	79	6007	-0.03	0.03	0.08	0.05	-0.16	0.00	-0.04	-0.17	-0.19	-0.04	1.00				
12. Age ²	2162.61	225	6241	6007	-0.04	0.00	0.03	0.04	-0.19	0.00	-0.06	-0.21	-0.30	-0.04	0.98	1.00			
13. Year is 2000	0.33	0	1	6007	0.00	0.01		-0.06	0.04	-0.02	-0.25	0.10	0.02	0.00	0.00	0.00	1.00		
14. Year is 2001	0.33	0	1	6007	0.01	0.00	-0.02	0.06	-0.01	0.05	0.09	-0.05	-0.05	0.00	0.00	0.00	-0.50	1.00	
15. Year is 2002	0.33	0	1	6007	-0.01	-0.01	0.02	-0.01	-0.02	-0.03	0.17	-0.04	0.02	0.00	0.00	0.00	-0.50	-0.50	1.00

Note: Pairwise correlations. Means and correlations computed using sample weights; ^a for years 2001–2002.

TABLE II
Descriptive statistics of informal investors

N	Has made informal investments										No investments	Total
	Other								Total			
	Close family	Other							Total	Total		
		Other relative	Work colleague	Friend or neighbor	Stranger	Other	Not available					
	53	15	15	34	16	4	39	123	176	5831	6007	
Has made informal investments (%)	100	100	100	100	100	100	100	100	100	0	3	
Is an owner-manager in a company (%)	21	14	57	28	42	0	48	37	32	11	12	
Has skills to start a new business (%)	52	74	56	66	84	33	65	66	63	34	35	
Perceived new business opportunities in region (%)	54	55	72	66	65	26	49	61	59	49	50	
Knows personally an entrepreneur (%)	76	74	94	89	83	100	75	84	82	43	45	
Fear of failure preventing entrepreneurial activity (%)	34	31	33	16	12	49	24	23	26	33	33	
Has university education (%)	15	13	54	36	31	44	37	36	30	28	28	
Household income among top one-third (%)	43	47	38	49	39	20	28	39	40	34	34	
Is employed (%)	70	59	82	81	57	52	57	67	68	53	54	
Is female (%)	62	19	14	6	33	49	47	26	36	52	52	
Age	43.9	38.8	34.2	33.6	39.1	31.6	46.3	38.7	40.2	43.3	43.2	

Note: All statistics computed using sample weights.

average by 188–254% when keeping other variables equal. As predicted, the relationship in non-family investments was statistically less significant in family-investments compared to non-family investments.

Hypothesis 2 predicted a positive relationship between the perceived skills to start a new business and the propensity to make micro-angel investments. The measure for these perceived skills was only available for years 2001–2002. The hypothesis received support in non-family investments.

Hypothesis 3 predicted a positive relationship between the perception of the availability of good opportunities for establishing new businesses and the propensity to make informal investments. This relationship was positive but not statistically significant.

Hypothesis 4 predicted a positive relationship between knowing entrepreneurs and the propensity to make informal investments. This hypothesis was clearly supported. For those stating that they know personally entrepreneurs, the propensity was increased from 355–676% on average compared to those not knowing entrepreneurs when keeping other variables equal.⁴

Hypothesis 5 predicted a negative relationship between the fear of failure preventing entrepreneurial activity and the propensity to make micro-angel investments. This hypothesis was not supported.

Hypothesis 6 predicted a positive relationship between university education and the propensity to make micro-angel investments. In model 1 this relationship was positive and significant in non-family investments and negative in family investments. In model 2 the relationships were similar but not significant.

Hypothesis 7 predicted a positive relationship between household income and the propensity to make micro-angel investments. Being ranked among the top-third in household incomes was not significantly related to the propensity to make informal venture capital investments.

Hypothesis 8 predicted a positive relationship between full-time employment and the propensity to make micro-angel investments. However, full-time employment was not significantly related to the propensity to make informal venture capital investments. The hypothesis was not supported.

Hypothesis 9 predicted a negative relationship between female gender and the propensity to make micro-angel investments. This hypothesis was strongly supported by the analysis for non-family investments. When controlling for other factors, female gender was associated with about 57–62% decrease in the propensity to make non-family informal investments. However, female gender was statistically significantly related to making family investments.

Hypothesis 10 predicted a curvilinear (inverted-U shaped) relationship between the age and the propensity to make micro-angel investments. This relationship was found to exist in family investments but not in non-family investments.

6. Discussion

In this paper, we set out to examine the factors explaining the decision of individuals to invest funds in new businesses started by others separated in investments made in businesses owned by close family members and investments made in more distant ventures. Building on prior descriptive research on the characteristics of informal venture capital investors and the economic research on the determinants of investing in risky assets in household portfolios, hypotheses were developed concerning the factors influencing these micro-angel investments in businesses owned by close family members and more distant entrepreneurs. The hypotheses were tested using data collected from 6007 Finnish individuals in 2000–2002.

Most of the findings were quite expected. The key determinants of the propensity to make both types of informal venture capital investments were found to be personal familiarity with entrepreneurs, status as an owner-manager in a firm, perceived skills in starting a new business, and gender. Interestingly, in contrast to the picture created in the economic literature on the demand for risky assets in household portfolios and as well as the early descriptive literature on the characteristics of informal venture capital investors, demographic factors such as income, age or education were not highlighted as very important determinants in our empirical analysis. Taken together, it seems that attitudes, experience, and skills matter

TABLE III
Multinomial logistic regression analyses of informal investments in firms owned by close family and others

	Model 1			Model 2		
	Family	Other	Difference family versus other	Family	Other	Difference family versus other
Is an owner-manager in a company	1.287 n.s. (0.480)	3.543 *** (0.905)	*	1.239 n.s. (0.772)	2.880 *** (0.941)	n.s.
Has skills to start a new business				1.477 n.s. (0.804)	1.790 * (0.533)	n.s.
Perceived new business opportunities in region	1.288 n.s. (0.501)	1.352 n.s. (0.325)	n.s.	1.238 n.s. (0.589)	1.301 n.s. (0.338)	n.s.
Knows personally an entrepreneur	5.129 *** (2.371)	5.156 *** (1.423)	n.s.	7.764 ** (5.577)	4.550 *** (1.337)	n.s.
Fear of failure preventing entrepreneurial activity	1.169 n.s. (0.460)	0.870 n.s. (0.223)	n.s.	1.091 n.s. (0.576)	0.965 n.s. (0.260)	n.s.
Has university education	0.566 * (0.196)	1.578 * (0.356)	**	0.746 n.s. (0.309)	1.203 n.s. (0.304)	n.s.
Household income among top one-third	1.156 n.s. (0.375)	1.005 n.s. (0.228)	n.s.	1.007 n.s. (0.450)	0.923 n.s. (0.236)	n.s.
Is employed	0.941 n.s. (0.385)	1.027 n.s. (0.313)	n.s.	0.578 n.s. (0.336)	1.190 n.s. (0.408)	n.s.
Is female	1.846 * (0.528)	0.378 *** (0.084)	***	2.518 * (1.138)	0.433 *** (0.110)	***
Age	1.185 ** (0.074)	0.934 * (0.038)	***	1.218 * (0.110)	0.910 * (0.040)	**
Age ²	0.998 ** (0.001)	1.001 + (0.000)	**	0.998 * (0.001)	1.001 * (0.001)	**
Year is 2000	3.337 ** (1.293)	0.792 n.s. (0.212)	***			
Year is 2001	1.528 n.s. (0.659)	1.119 n.s. (0.257)	n.s.	1.599 (0.685)	1.073 (0.252)	n.s.
Number of observations	6007	6007		4005	4005	

Note: Dependent variable: 0 = Has not made informal investments; 1 = Has made informal investments in firm owned by a close family member; 2 = Other informal investments. Analyses computed using sample weights. Missing values imputed. The coefficients are exponentiated betas. Standard errors are reported in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$, n.s. not significant, one sided tests for hypothesized variables, two sided tests for control variables.

more than the demographics in explaining the propensity to make informal investments.

Examining the differences in the determinants of investments in firms owned by close family members compared to other firms, we found that the predicted determinants explain better investments made into firms owned by other than close family members. This was expected on the grounds that whereas investments in more distant firms are likely to be driven by a proactive decision to make informal investments, investments in firms owned by close family members can be

more reactive investments driven by a necessity to support a business owned by a close family member. Also, it is reasonable to expect that investments in family members' businesses may be driven more by altruistic motivations than would be the case otherwise.

6.1. Implications for research

To our knowledge, this study has been one of the first studies to extend the descriptive analysis of the characteristics of informal investors by

taking a random sample of all individuals in a nation and examining the determinants influencing the propensity individuals to make informal venture capital investments. There has been a need to move ahead from the first generation of descriptive studies on informal venture capital to the next level (Mason and Harrison, 2000a), by analyzing factors that drive informal investment. Descriptive studies do not provide a sufficient basis on which to understand how to resolve market failures and how to stimulate informal investment activity. To provide answers for such questions, it is important to study what influences informal venture capital investment activity among individuals. This study has taken one of the first steps to answer this question.

Second, this study is among the first ones to test the differences in the drivers of family investments and non-family investments. There has been a widely held assumption that the drivers of family investments (so called “love money”) differs from the drivers of real business angel investments. However, prior research has not tested this assumption empirically. By including both types of investments and testing the differences statistically, our paper contributes to the literature by demonstrating the validity of this assumption.

The present study has also been among the first to apply social psychological theory of planned behavior (Ajzen, 1991) in explaining the propensity of individuals to make informal investments in new businesses owned by others. On the basis of our results, the theory can significantly explain the behavior of individuals also in this domain.

The present study has also been among the first to bridge the literature on determinants of informal venture capital investments with the economic literature on the determinants of demand for risky assets in household portfolios. There is good potential for cross-fertilization between these two streams of literature. For informal venture capital literature, the sophisticated econometric methods developed in household portfolios research can improve the reliability of the estimates and help in developing research better capable to support the creation of effective policy measures (Lerner, 1998). In addition, the research on household portfolios is in

some areas theoretically more advanced, and it has also already examined in detail many of the potentially important determinants of informal investments (Guiso et al., 2002b). For instance, research on household portfolios has shown that demand for risky assets is influenced by wealth and marginal tax rate (Hochguertel et al., 1997). Higher taxes have been shown to reduce demand for risky assets (Asea and Turnovsky, 1998). Tax incentives have been found to significantly influence household investment behavior (Bergstresser and Poterba, 2002; Poterba and Samwick, 2003). On the other hand, for researchers of household portfolios, the detailed and context rich studies of informal venture capital can give a better understanding of this difficult and little known asset class, which could be incorporated in the future household survey instruments.

6.2. *Implications for public policy*

Our findings suggest pointers for policy-makers regarding how to increase the supply of early stage risk capital. By focusing policy measures correctly to accelerate micro-angel investments, the difficult market failure in early stage risk financing could be partially alleviated. Based on the findings that entrepreneurial experience and skills to build new businesses are key determinants of the propensity to make informal investments (non-family investments in particular), spurring micro-angel activity would thereby also increase the involvement of experienced entrepreneurs and business executives in the development of new businesses. The finding that knowing an entrepreneur is the single most determinant of the propensity of individuals to make informal investments gives support for the policy measures encouraging creation and financing of angel networks and matching services to match entrepreneurs and potential investors (Mason and Harrison, 1995, 1997; European Commission, 2002). In addition, the under-representation of women, combined with the finding that knowing entrepreneurs is a key determinant of informal investment, suggests that educational and networking based policy measures should be actively targeted also at women in order to more fully tap the potential pool of informal venture capital.

The recognition of this study – that informal investments can also be examined as one specialized risky asset class in household portfolios – leads to several policy implications. Household stock ownership has increased significantly all over the World during the recent two decades as a consequence of a rapidly developing *equity culture* (Guiso et al., 2002b; Haliassos and Hassapis, 2002). To stimulate the creation of an informal venture capital market, educative policy measures could be targeted to make informal investments a part of the developing equity culture. The role of education in creating a supportive culture for informal investments is corroborated by our finding that social psychological theory of planned behavior appears to explain greatly the propensity of individuals to invest.

Secondly, the conception of informal investments as a risky asset in household portfolios leads to a conclusion that tax-related investment elasticities could be a significant determinant influencing the propensity of individuals to make micro-angel investments (Poterba, 1989; Asea and Turnovsky, 1998; Bergstresser and Poterba, 2002; Poterba and Samwick, 2003). While tax incentives for informal investment have been introduced and found effective in practice in many countries (European Commission, 2002; Lipper and Sommer, 2002; Mason and Harrison, 2002a), the effects of these incentives could be researched in more detail to help develop optimal policy measures and incentives to spur value-added informal venture capital investment to help resolve market failures in early stage investments.

Finally, policy-makers should recognize that informal investment substantially increases the population-wide exposure to entrepreneurial activity. Because of the nature of this investment, informal investors are likely to closely monitor the activities and performance of the start-up ventures that they have funded. Thus, the promotion of informal investment should provide a useful and effective tool in strengthening national entrepreneurial culture – a policy objective that is explicitly evoked by many national governments.

6.3. Implications for entrepreneurs

The finding that knowing an entrepreneur is the single most important determinant for individuals

making informal venture capital investments suggests that if an entrepreneur wishes to raise informal venture capital, and if friends or relatives are not willing or capable to invest, the chances of finding an informal investor can be improved by making the venture known to the pool of potential investors for instance in angel networks. Prior research has identified several strategies for entrepreneurs building networks and leveraging social capital to tap investors (Steier and Greenwood, 1999, 2000; Arenius, 2002; Van Osnabrugge and Robinson, 2000). The findings of this study also suggest that informal investors, particularly non-family investors, are in general experienced entrepreneurs and consider having the knowledge, skills and experience to start a new business. For entrepreneurs, this confirms common advice from prior research that informal venture capital can be a valuable source of value added support in addition to the capital.

7. Limitations and suggestions for further research

While many findings reported in this study are encouraging and interesting, the limitations of our empirical sample should be kept in mind. While this has been one of the first studies to analyze influences on informal investment activity using a nationally representative sample, this sample has been limited to the working-age population in Finland. Even though we believe that many (if not most) of the relationships detected here would be replicated in also other national environments, some national biases might exist. This applies particularly to the prevalence of women as informal investors. As a sample limitation, it should be kept in mind that Finland is a high-tax country with a relatively weak entrepreneurial culture. Both of these factors might influence informal investment activity in Finland. The analysis reported here should be replicated in other national environment to establish the generality of our findings.

An important limitation of our study is that we have used a categorical variable as a measure of informal investment activity. An analysis of the influences on the magnitude of individual investments would represent a natural next step to this analysis. Further, our analysis focuses on the decision of an individual to make an investment.

However, it does not focus on what types of businesses individuals invest except for the distinction between family and nonfamily businesses.

Because of its emphasis on national representativeness, the GEM consortium has had to trade sample size for the breadth and depth of empirical measures. Most of the predictor variables used here have been dichotomous for the simple reason that it would be prohibitively expensive to collect more fine-grained data. For the same reason, we have not been able to examine many important influences, such as wealth, background as a serial entrepreneur, exit from an own company, the extent and quality of the individual's own social networks, or the individual's own family background on her informal investment behavior. The study of these issues in particular might shed more light into the findings reported here.

Finally, it should be kept in mind that informal investments, as measured in the GEM data, are likely to be targeted at a somewhat different group of start-up companies than what formal venture capital funds and even business angels would be addressing. While there is likely to be some overlap in the target populations of these, the GEM data probably captures a wider and less selective population of start-up companies than formal venture capital funds and business angels do. Thus, it is not reasonable to expect that all, or even most, start-up companies receiving informal investment would ever even seek VC funding. Policy-makers and researchers should be mindful of the complementary nature of the informal investment activity, and to elaborate the potential implications for research and public policy.

To conclude, this has been a first attempt to examine causal influences on what the GEM reports have shown to be a nationally very significant, and hitherto virtually undetected, phenomenon – micro-angel activity. We hope that our analysis will prompt further research into this important area.

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Notes

¹ We recognize that formal and informal (as measured in the GEM data) VC investments do not necessarily go into the same companies. Indeed, it appears reasonable to assume that informal investments are made on a less selective basis, as compared to formal VC investments.

² The data collection was made possible by financial support by the Finnish Ministry of Trade and Industry and the National Technology Agency, Tekes, of Finland.

³ For a detailed description of the survey protocol, see the GEM operations manual at www.gemconsortium.org.

⁴ Given that our data is cross-sectional, and that an investment is likely to lead the investor to know the investee, the causality of the relationship between knowing entrepreneur(s) personally and the propensity to make informal investments could also work to the opposite direction. While we cannot fully rule out this possibility, the relationship is not fully trivial either, given that 20% of the informal investors disagreed with the statement: "You know someone personally who started a business in the past two years". Further, whereas 43% of the sample knew entrepreneurs, only about 3% made informal investments suggesting that investment activity is not likely to be the sole and automatic determinant of knowing entrepreneurs personally. While our data does not allow us to reject the possibility of reverse causality, we believe, on the basis of our theoretical arguments and our findings, that the relationship is at least largely explained by personal familiarity with entrepreneurs increasing the propensity of individuals to make informal investments.

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