Entrepreneurial Spirits in Women and Men. The role of risk propensity and financial literacy

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Abstract

We investigate the attitudes to entreprensurhip of Italian households particualry focusing on the importance of risk aversion and fianncial literacy as potentially important facotrs shaping the decisions. We put the gender lenses to detect whwther, and to what extent, women and men differ in their propensity to run a business. We carry out our research by using a sample of the Bank of Italy SHIW dataset for the year 2008 and 2010. Our findings suggest a strong heterogeneity of the importance of risk aversion and financial literacy as entrepreneurial drivers, being significant for men only and more pronounced in affecting the younger entrepreneurs decisions.

Keywords: entrepreneurship, financial literacy, risk aversion, gender economics

1. Introduction

What drives the choice of being an entrepreneur? To summarize the main drivers into two categories, we can claim that individual and contextual factors are both responsible to shape the decision to become an entrepreneur. The institutional settings, as well as the level of uncertainty of the environment, including the nature and degree of complexity of the opportunity itself, may deter or rather provide incentives to enter entrepreneurship. Personality characteristics and attitudes are deemed to affect the willingness to become entrepreneurs as well. Among these individual level factors, risk taking propensity and financial knowledge are important aspects that may drive the process of recognizing and capturing entrepreneurial opportunities.

Risk attitudes affect decision making in a large and diversified number of contexts (e.g investment and savings decisions, mobility, financing decisions, among others). A substantial body of academic literature in social sciences has studied how individuals incorporate risk in their decisions, adopting

explanations that rely upon economic (e.g. expected utility theory) or behavioral decision theories (see Miller, 2007 for a discussion). Entrepreneurs regularly take decisions which reveal their risk attitudes (e.g. entry into new markets, introduction of new products etc.), such that risk taking is generally considered an essential characteristic of entrepreneurs (Block et al., 2015; Douglas and Shepherd 2002). Becoming an entrepreneur constitutes a risky option because of the unknown and unknowable outcomes of the entrepreneurial adventure, which may lead to suboptimal returns and ultimately failure (Knight, 2002). Despite a great interest in the topic, research exploring risk taking attitudes on entrepreneurial entry has not yet gathered a consistent empirical foundation on which to build strong conclusions. While conventional wisdom has long underpinned the proposition that entrepreneurs are risk takers (Elston and Audretsch, 2010), extant empirical studies have not produced univocal results to date.

Previous literature has documented a strong association between financial literacy and households' financial decision-making, such as wealth accumulation, retirement planning (Bucher-Koenen and Lusardi, 2011; Lusardi and Mitchell, 2007, 2011; Lusardi et al., 2017; Van Rooij et al., 2012), investment (Disney and Gathergood, 2013; Lusardi and Tufano, 2009; Lusardi and Mitchell, 2007b; Stango and Zinman, 2009) and stock market participation Jappelli and Padula, 2015; Klapper et al., 2013; Van Rooij et al., 2011). Despite the agreement that financial literacy is crucial for financial behavior and well-being, the relationship between entrepreneurship and financial literacy has been largely neglected. This is quite surprising given the importance that financial knowledge plays for an entrepreneur in the awareness and understanding of different financing options and in handling financial risks and opportunities. One excpetion is represented by the recent work by Klapper et al. (2015) it is shown that financial literacy is correlated with better entrepreneurial outcome. The authors are able , actually, to go beyond correlation and claim causality. They examine the relationship between financial literacy and entrepreneurship, with reference to the US. Their results show that financial literacy increases the likelihood of being an entrepreneur, in magnitudes between 14-32 percent, as well as it enhances the performance of entrepreneurs, be it income, savings and retirement funds.

Although much research is devoted to the question of what makes an entrepreneur, empirical studies have not gone beyond the examination of how standard individual factors affect entrepreneurship. A key question that remains to be addressed is to what extent risk attitudes and financial literacy jointly affect the probability of becoming an entrepreneur. While the combination of both aspects has not been investigated in the past, there is reason to believe that they jointly play a role for the decision to enter entrepreneurship. This is, to the best of our knowledge, the first study that tries to tease out the impact of a personality trait (i.e risk attitude) with an acquirable competence (i.e financial literacy) on entrepreneurship. Moreover, we also know relatively little about how differences associated with age and gender can explain variance in the relationship between financial literacy, risk taking and likelihood to become an entrepreneur.

Putting the gender lenses into the entrpreneurial analysis, it is well known and documented that women have been traditionally been more distant from the the labour market compared to men and even more from entrepreneurial tasks. Two main causes point at this outcome. On one side women are traditionally less associated to entrepreneurial tasks being less exposed to responsibility task since start. Since childhood boys are associated to more challenging tasks and they are exposed to more risk taking actions, leading, in turn, to higher ability to cope with risk and accept a higher level of risk in making decisions. Indeed, men are socialized into entrepreneurship to a higher degree than women are (Scherer et al., 1990; McAdam et al., 2018) and they are often pushed into entrepreneurship by their desire of control. Conversely, women's reasons to start a new venture include frustration as employee (e.g. little recognition that society and employers give to their jobs) and the need for a higher flexibility that family imposes (Welsh and Dragusin, 2006). During lifetime, women face higher credit constraints and more difficulties in borrowing (Alesina Lotti), which exacerbate the low presence in the entrepreneurial activities.

On the other hand, this chanel at work can be reconducted to "nurture" rather than nature, women tend to show low propension for risk, which is the main ingredient to turn to an entrepreneurial activity.

Family background, on another side, are also considered to be a traditional driver of embarking in business activities, particularly in conservative countries like Italy. Moreover, in countries were financial restrictions are binding and credit is more limited, financial capital availability, typically coming from the family of origin, can be of essential importance to start up a business.

Therefore, in this paper we also explore if any variation is expected when different gender and age sub-samples are considered. A better understanding of the role played by financial literacy and risk taking in entrepreneurship has the potential to move the discussion forward and to improve the awareness of entry decisions in new ventures for potential entrepreneurs.

We exploit information drawn from the Survey of Household Income and Wealth (SHIW), run in 2008 and 2010 by the Bank of Italy. The sample is representative of the population living in Italy. The dataset is rich because it includes general information about Italian households (such as income or employment status), as well as responses about individuals' willingness to take risks and level of financial knowledge. It is useful to stress again the key novelty of the dataset we use. Having a sample representative of the Italian population we can estimate the decision of being an entrepreneur rather than an employee, without restricting our analysis to the choices of entrepreneurs only, like several other studies do by observing the self-selected sample of entrepreneurs only.

The remainder of the paper is organized as follows. Section 2 discusses the background literature and presents our hypotheses. Section 3 introduces the data, describes the explanatory variables used in the empirical analysis and provides some relevant descriptive statistics. Section 4 presents the econometric models and discusses the results. Section 5 concludes the paper.

2. Hypotheses

2.1 Entrepreneurship and risk taking propensity

Risk tolerance has often been regarded as an important determinant for entrepreneurial entry. The decision to become an entrepreneur requires a substantial amount of risk, as it is not predictable whether the venture will be successful or will incur into losses, potentially leading to failure or closure of the business (Knight, 2002). Individuals who want to become entrepreneurs typically combine an assessment of the variance in returns (e.g. using risk and sensitivity analysis) with an evaluation of the likelihood of success of the venture. While the significance and variability of any possible losses may drive risk perceptions and entrepreneurial decisions (Forlani and Mullins, 2001), research has shown that risk is most often perceived as the likelihood of venture failure, rather than the variance in the economic returns, as the traditional finance theory would predict (March and Shapira 1987).

The literature on entrepreneurship has therefore portrayed entrepreneurs as risk-takers (Palmer, 1971; Elston and Audretsch, 2010; Stewart and Roth, 2001) and this conventional wisdom has been endorsed by early theoretical models postulating that risk averse individuals are self-selected into paid employment, while risk tolerant individuals become entrepreneurs (Kanbur, 1979 and Kihlstrom and Laffont, 1979). Most of the research about entrepreneurship and risk attitudes has treated entrepreneurs as a homogenous group, comparing how they differ in their risk taking propensity from non-entrepreneurs (e.g. managers, employees; see Caliendo et al., 2009; Begley and Boyd 1987; Brockhaus 1980, Norton and Moore, 2006; Kan, and Tsai, 2006 among others) and little research has considered differences in risk attitudes within the group of entrepreneurs itself (Block et al., 2015; Forlani and Mullins, 2001).

The relationship between risk and entrepreneurship has been examined in the entrepreneurship literature from several points of view. One strand of literature has focused on the factors influencing entrepreneurial risk perceptions in making decisions. Because it cannot be known in advance if an entrepreneurial opportunity may turn into a success or a failure, individuals willing to become entrepreneurs have to deal with the resources and information in hand to assess the level risk of an entrepreneurial opportunity. As far as they proceed in their entrepreneurial activity, new information is collected, so that they progressively shift their goals and readjust their risk perceptions (Huang and Pearce, 2015). Cognitive biases and the use of heuristics (e.g. overconfidence, illusion of control,

overoptimism) have been found to lower the entrepreneurs' perception of risk (Simon et al., 2000; Huang and Pearce, 2015; Dew et al., 2009), leading them to overlook potential negative outcomes and increase their risk taking behaviours (Antonites and Wordsworth, 2009; Zhang and Quieto, 2017). Other studies have pointed out that the perception of risk varies among individuals (Forlani and Mullins, 2001), depending upon the motivations underlying entrepreneurial actions (e.g. creativity versus necessity, Block et al., 2015) or the contexts in which business decisions are taken, which may be characterized by different degrees of uncertainty, time pressure and risk (see Shepherd et al. 2014 for a review). Thus, an entrepreneur's risk attitude does not exclusively depend upon personality traits forged by nature or nurture (McCarthy, 2000), but is rather much contextual and should be studied in the context of a complex decision making process (Block et al., 2015).

The notion that entrepreneurs are less risk averse than other individuals has been scrutinized in several empirical studies which have reported mixed results. Empirical support to the idea that entrepreneurs are risk-takers has been provided by Stewart and Roth (2001) and Nieuwenhuizen & Kroon (2002), who found a strong relationship between willingness to take risks and entrepreneurial choices. In the same line are the findings by Cramer et al. (2002), Douglas and Shepherd (2002) and Caliendo et al. (2009; 2014), reporting that individuals with lower risk aversion are more likely to enter self-employment. Moreover, a stronger tendency towards bearing risk stimulates entrepreneurs to start riskier ventures (Mullins and Forlani, 2005) and has been found to have positive impact on new venture performance (Rauch et al. 2009).

A few studies have questioned the idea that risk taking is unavoidably linked with entrepreneurship. Little or no impact of risk attitude on entrepreneurial decisions is found in Palich and Bagby (1995), Brockhaus (1980), Norton and Moore (2006), Keh et al. (2002) and Elston and Audretsch (2011). Miner and Raju (2004) and Xu and Reuf (2004) suggest that entrepreneurs are not more risk tolerant than other individuals, rather in some cases they are even more risk avoidant than other managers and employed persons. Following this line of though other early studies have demonstrated that entrepreneurs exhibit moderate levels of risk-taking propensities and tend to avoid embracing opportunities involving extreme

risks (Brockhaus, 1980; Begley and Boyd, 1987). A limited number of studies has also explored the relation between risk attitudes and entrepreneurial survival (Caliendo et al, 2010), indicating that individuals with medium risk tolerance are most likely of entrepreneurial survival. Notwithstanding the inconclusive evidence drawn from the literature on entrepreneurship and risk attitudes, we expect that risk taking plays an important role in shaping the decision to become an entrepreneur. We thus advance the following hypothesis:

H1. The higher is an individual's risk taking propensity, the higher is the likelihood to become an entrepreneur

Although considerable attention has been devoted to studying the attitude to risk of entrepreneurs, much less effort has been taken to investigating if other individual level dimensions exert any influence on the linkage between risk and entrepreneurial choice. Individual level characteristics may influence the relationship between risk taking and entrepreneurship as well. Individuals are heterogeneous in both their risk attitude and assessment of risk (Dohmen et al., 2011), which ultimately affect entrepreneurial decisions. The risk attitude necessary to face the high uncertainty (Knight, 1921) and risks (Douglas & Shepherd, 2000) associated with pursuing an entrepreneurial career may vary from individual to individual. The extent to which an individual's attitude toward risk is influencing the decision to become an entrepreneur is for instance affected by age and gender. Differences in age and gender may help explain why some risk takers may decide to become entrepreneurs and others not.

Numerous works in economics have indicated that individuals are less willing to take risks as they get older (Borghans et al., 2008; Dohmen et al., 2011), this being largely associated with a cognitive aging process (Bonsang and Dohmen, 2015). An age profile for the risk propensity is important for explaining the decision to become an entrepreneur, as well as for understanding an entrepreneur's behavior in complex and risky decision environments.

Another common belief is that women are more risk averse than men. This stereotype seems to be confirmed by previous empirical investigations of gender differences in risk taking, confirming that women tend to be less risk takers than men (Eckel and Grossman, 2008; Croson and Gneezy, 2009).

Gender differences in willingness to take risks has been documented to explain why women are less willing to sort into relatively risky investments (Charness and Gneezy, 2012; Sundén, and Surette, 1998; Jianakoplos and Bernasek, 1998) and compensations schemes (Niederle and Vesterlund 2007; Dohmen and Falk, 2011). Differences in risk taking between men and woman may explain the gender gap in entrepreneurship, which has been indicated as resulting from differences in individual perceptions (e.g. alertness to opportunities, fear of failure, beliefs in subjective capabilities and skills), network acquaintances, family background (Langowitz, and Minniti, 2007). Taken together, we expect:

H1a. The positive association between risk taking and likelihood to become entrepreneurs is affected by age differences, such that risk lovers are more likely to become entrepreneurs if they are less than 50 years old

H1b. The positive association between risk taking and likelihood to become entrepreneurs is affected by gender differences, such that risk lovers are more likely to become entrepreneurs if they are men

2.2 Entrepreneurship and financial literacy

Financial literacy has been widely regarded as an important component of an individual's background that contributes to make sound informed financial decisions (e.g. financial planning, wealth accumulation, debt, pensions and investment decisions). Financial literacy has been defined as "a combination of awareness, knowledge, skill, attitude, and behavior required to take financial decisions and ultimately achieve individual financial well-being" (OECD, 2013). Financial literacy encompasses a number of concepts (e.g. financial awareness and knowledge, financial skills and financial capability) [1], that have been operationalized by Lusardi and Mitchell (2007; 2008; 2011) into a predefined set of metrics, initially designed for the US Health and Retirement Survey. This financial literacy module has been incorporated into several surveys in the United States (Lusardi et al., 2010; Lusardi and Mitchell, 2011a) and abroad

[1] Financial literacy has often been conceived as a multi-dimensional concept, which is difficult to frame into a comprehensive definition and the measurement of which is not straightforward. Moreover, from the empirical point of view it is difficult to assess the direction of causality between financial literacy and financial decision-making, as financial literacy is potentially endogenous. Many papers have therefore relied on instrumental variable estimation (Klapper et al., 2013).

(OECD, 2005) and has proved effective in assessing the knowledge of basic financial concepts useful to take responsible financial decisions.

To test basic financial knowledge a set of questions concerning risk diversification, interest rate compounding and inflation have been proposed (Lusardi et al., 2010; Lusardi and Mitchell, 2011a). Attempts have been made to augment basic financial literacy metrics with more sophisticated concepts, such as asset pricing, financial management and mortgages (see Hilgert et al., 2003; Lusardi, 2011; Lusardi et al., 2014a).

It has been found that financial illiteracy is widespread and that a large majority of respondents lack the basic knowledge of simple financial concepts (Lusardi and Mitchell, 2014). The same scenario is found when more sophisticated measures of financial literacy are employed (Hilgert et al., 2003; Lusardi, 2011; Lusardi et al., 2014a). Existing studies have shown that lack of financial literacy is associated with poor borrowing decisions (Disney and Gathergood, 2013; Lusardi and Tufano, 2009; Stango and Zinman, 2009) and investment choices (Bianchi, 2018; Lusardi and Mitchell, 2007b), implying a high reliance on family and friends as the main source of financial advice (Van Rooij et al., 2011). Financial illiterate individuals are less likely to accumulate wealth, to plan for retirement (Bucher-Koenen and Lusardi, 2011; Lusardi and Mitchell, 2007, 2011; Lusardi et al., 2017; Van Rooij et al., 2012) and to invest in stock (Jappelli and Padula, 2015; Klapper et al., 2013; Van Rooij et al., 2011). However, it has been argued that the effect of financial literacy on financial behavior might be driven by other third variables, such as individual cognitive ability (see the meta-analysis by Fernandes et al., 2014 for a discussion).

Though there is now a significant empirical body of work on the impact of financial literacy on different types of financial planning decisions, far less attention has been devoted to the links between financial literacy and entrepreneurship. To our knowledge, empirical evidence on this side is scant. A recent paper by Ćumurović and Hyll (2017) investigates the linkage between financial literacy and self-employment, finding a positive correlation. Bruhn & Zia (2011) and Engström and McKelvie (2017) find that financial literacy led to improved business performance of micro and small firms, in Bosnia-Herzegovina and Ecuador respectively.

However, the question of how financial literacy impacts upon becoming an entrepreneur is still to be answered. Becoming an entrepreneur involves taking sound financial planning and investment decisions, which imply a basic knowledge of financial concepts. Financial management skills and knowledge represent critical competences that entrepreneurs must have in new venture creation and in subsequent venture management. The awareness of basic financial concepts (such as the working of interest compounding, the effects of inflation, the time value of money and diversification potential) constitutes a basis upon which individuals assess the benefits and costs of an entrepreneurial opportunity.

The lack of financial knowledge of entrepreneurs is often portrayed to undermine entrepreneurial activity and to be responsible for high business mortality rates (Bosma and Harding, 2006; Drexler et al. 2014). In fact, if an individual shows low levels of financial literacy, there are reasons to assume that he/she will likely be underprepared to make complex decisions concerning the financial management of a new venture, this in turn affecting the probability of a venture success.

We therefore advance the following hypothesis:

H2. The higher is an individual's financial literacy, the higher is the likelihood to become an entrepreneur

Differences associated with age can help explain variance in the relationship between financial literacy and likelihood to become an entrepreneur. In general, financial literacy (both basic and advanced) is highest among middle-aged individuals, while it is lowest among the youngest and eldest people (Van Rooij et al., 2011). Financial literacy is found to decline with age both in the US and other countries (Lusardi and Mitchell, 2011a; Lusardi et al., 2014), even though the perceived confidence in one's own financial decision-making abilities seems to increase with age (Lusardi et al., 2014). This gap persisted also when more sophisticated literacy questions were administered (Lusardi et al., 2014a).

Differences in financial literacy are also linked to gender issues. Overall, women display a much lower basic financial knowledge compared to men, this being sharper when considering advanced financial literacy (Almenberg and Dreber, 2015; Lusardi and Mitchell, 2008; Mottola, 2003; Potrich et al., 2015). The gender gap is widespread across countries (Bucher-Koenen et al., 2017), being this pattern highest

in more developed countries (Cupák et al., 2018). A striking feature is that women are not only less likely to answer financial literacy questions correctly, but also to indicate that they do not know the answer, a result that is consistent across countries (Bucher-Koenen et al., 2017; Lusardi and Mitchell, 2011b). Moreover, gender differences are persistent across age, so that women are less financially knowledgeable than men, independently of the considered age (Lusardi et al., 2010; Lusardi and Tufano, 2009).

Observed sex differences in financial literacy have been largely attributed to socio-demographic, cultural factors and economic behaviors. In particular, the acquisition of financial knowledge for women within the household clearly depends on the extent to which household tasks are divided and decision-making is allocated (e.g. day-to-day management of household finances; Hsu, 2011). It is also related to what extent socio-cultural dynamics drive the trade-off between benefits and costs of accumulating financial knowledge (e.g. interest in finance matters, passive approach to money). Other approaches have emphasized sex differences in the way financial literacy is acquired (Brown and Graf, 2013; Fonseca et al., 2012) or self-confidence is built (Bucher-Koenen et al., 2012). Given this evidence, we set the following hypotheses:

H2a. The positive association between financial literacy and likelihood to become entrepreneurs is affected by age differences, such that individuals with financial literacy are more likely to become entrepreneurs if they are less than 50 years old

H2b. The positive association between financial literacy and likelihood to become entrepreneurs is affected by gender differences, such that individuals with financial literacy are more likely to become entrepreneurs if they are men

3. Data and Methodology

The data used in our empirical analysis are drawn from the Survey of Household Income and Wealth (SHIW), which is conducted every two years by the Bank of Italy for a representative sample of the Italian population. The SHIW dataset includes several information about Italian households,

including household composition and characteristics, income and employment status, and a measure of risk propensity. In the 2008 and 2010 waves, in addition to the standard questionnaire, the whole sample was given an extra module on financial literacy answered by the household head, who is the person primarily responsible for the household budget. Since we want to investigate the impact of financial knowledge on being an entrepreneur, we use pooled data from both 2008 and 2010 waves.

In 2008 the survey covered 7,977 households composed of 19,907 individuals, while in 2010 it covered 7,951 households for a total of 19,836 individuals. Since financial literacy and risk propensity questions are answered by the household head, we restrict our sample to him/her and his/her spouse or partner, to whom we attribute head's responses. Overall, we are left with a sample of 26,032 individuals age 18 or more from 15,921 households.

The SHIW is a rich dataset that allows us to gather information on many socio-demographic characteristics like gender, age, region, marital status, education, income, and employment status (descriptive statistics are displayed in Table 1).

[Insert Table 1 here]

Since the 2008 and 2010 surveys do not provide information on the intention to become entrepreneur or how long individuals have been entrepreneurs, we will exploit the employment status information. Our definition of entrepreneur includes individuals who are either individual entrepreneurs, or owners or members of family businesses. According to this definition, entrepreneurs are 2% of the sample. As a robustness check, we will then re-do our empirical analysis using a broader definition of entrepreneurs, which also includes professionals, self-employed craftsmen, business partners, and covers around 8% of the sample.

For what concerns our variables of interest, we define risk propensity as a dummy variable taking value 1 if the individual says he or she has a preference for investments that offer a good return with a fair degree of protection for the invested capital (or, at the extreme, very high returns, but with a high risk of losing part of the capital), as opposed to a fair return, with a good degree of protection for the

invested capital (or, at the extreme, low returns, with no risk of losing the invested capital). Based on this 4-option scale of risk propensity, about 17% of individuals in the sample can be defined risk tolerant. The risk propensity question, as well as financial literacy ones, were asked to the household head, but since partners tend to have similar characteristics, we associate head's risk propensity and financial literacy levels to his/her spouse or partner.

In order to define our second variable of interest, i.e. financial knowledge, we follow Lusardi and Mitchell (2011) by using as a measure of financial literacy an indicator equal to 1 if the respondent answered correctly questions capturing the three basic economic concepts of interest rate, inflation, and risk diversification. In the SHIW, the interest rate concept just appears as part of the inflation question. The precise wording of the two questions is as follows:

> *Interest rate and inflation*: Imagine leaving €1,000 in a current account that pays 1% interest and has no charges. Imagine that inflation is running at 2%. Do you think that if you withdraw the money in a year's time you will be able to buy the same amount of goods as if you spent the €1,000 today?
>
> Possible answers: Yes; No, I will be able to buy less; No, I will be able to buy more; Don't know.
>
> *Risk diversification*: Which of the following investment strategies do you think entails the greatest risk of losing your capital?
>
> Possible answers: Investing in the shares of a single company; Investing in the shares of more than one company; Don't know.

About 43% of individuals in the sample can be defined financially literate, i.e. they answered correctly to both questions. Table 2 shows that this percentage is higher among men with respect to women: almost 46% of men are financially literate compared to about 42% of women. The percentage of risk tolerant individuals and entrepreneurs is higher among men, too.

[Insert Table 2 here]

Table 2 also reports socio-demographic characteristics by age groups, showing that individuals who are 50 years old or younger are more educated, more risk tolerant and financially literate, and have a larger fraction of entrepreneurs.

Before moving to the multivariate analysis, Graph 1 shows the probability of being entrepreneur by gender and financial literacy levels.

[Insert Graph 1 here]

Interestingly, the probability of being entrepreneur is on average higher for financially literate men than, in this order, not financially literate men, financially literate women, and not financially literate women. Similarly, the likelihood of being entrepreneur is on average higher for risk tolerant men than, in this order, not risk tolerant men, risk tolerant women, and not risk tolerant women (Graph 2).

[Insert Graph 2 here]

In what follows, we also investigate the gender perspective of the correlation between financial literacy and risk propensity, and the likelihood of being entrepreneurs.

4. Estimation Results

A multivariate analysis of the effect of financial literacy and risk propensity on being an entrepreneur is conducted estimating a linear probability model of the following specification:

$$Entrepreneur_{it}=\beta_0+\beta_1\ Financial\_Literacy_{it}+\ \beta_2\ Risk\_Propensity_{it}\ +\beta_3 X_{it}+\varepsilon_{it}$$

where *Entrepreneur, Financial_Literacy,* and *Risk_Propensity* are dummy variables, and *X* is a vector of covariates including gender, region, a second-order polynomial in age, marital status, education, and income. Table 3 summarizes the results.

[Insert Table 3 here]

The first column of Table 3, where only socio-demographics are included, shows that female are less likely to be entrepreneur, even after controlling for many characteristics like region, age, marital status, education, and income. There is also a negative correlation between being married and graduated and having a business. On the other hand, income is positively correlated with being an entrepreneur. In the second column of Table 3, we add a measure for risk propensity, and coefficients on the other covariates remain the same as in the first column. As we would have expected from the literature, individuals that have higher risk propensity, are more likely to be entrepreneurs (see, for example, Knight, 2002). This result is confirmed in the third column of Table 3, where we add a financial literacy measure. Financial knowledge does not seem to have a statistically significant effect in this specification. However, since we are interested in factors driving the event of becoming an entrepreneur, we want to focus on individuals closer to the time when this event happened. Indeed, if a person has been an entrepreneur for many years, a lot of factors may have changed over time since the entrepreneurial decision was made. Unfortunately, we do not have information about how long individuals have been entrepreneurs, thus we use a criterion based on age and we focus on younger individuals. In particular, we split the sample at age 50, which is about the average age of entrepreneurs in our sample (similar results are obtained if the threshold is considered to be at age 45). The results for the two sub-samples are shown in Table 4.

[Insert Table 4 here]

Focusing on the sample of interest, i.e. the younger one, we see that coefficients on risk propensity and financial literacy are statistically significant for this subgroup (second column of Table 4). Financial literacy is positively associated with the likelihood of being an entrepreneur, after controlling for the educational level. This means that financial knowledge has an effect above and beyond the impact of education. This is consistent with Ćumurović and Hyll (2017) who found that financial literacy positively affects the probability of being self-employed. Also, the finding for which individuals that are risk tolerant are more likely to be entrepreneurs holds just for the younger subsample.

Regression results for individuals age under 50 show that women are still less likely to be entrepreneurs even after accounting for many socio-demographic characteristics. Up to now, we have

assumed that risk propensity and financial literacy have the same effect on the probability of being an entrepreneur for both men and women. Since we are interested in the gender perspective, in Table 5 we allow all characteristics to have different effects on men and women's probability of being an entrepreneur.

[Insert Table 5 here]

Interestingly, our variables of interest are statistically significant only for males (second column of Table 5). Indeed, financial literacy and risk propensity increase men's probability of being entrepreneurs, but they are not associated with women's likelihood. Also, marital status seems to matter for women: being married is negatively correlated with the probability of being business owner.

5. Robustness check

So far we have used a restrictive definition of entrepreneurs, i.e. individuals who are either individual entrepreneurs, or owners or members of family businesses. Now we extend it also to professionals, self-employed craftsmen, and business partners, to see whether our main findings still hold. Tables 6 to 8 report the multivariate regression analysis using this broad definition of entrepreneurs, and our findings are confirmed. In Table 6, we conduct a multivariate regression analysis on the probability of being entrepreneur, similarly to what was done in Table 3.

[Insert Table 6 here]

Even controlling for many socio-demographic characteristics, we still notice that women are less likely to be entrepreneurs. Looking at our variables of interest, we already see that both risk propensity and financial literacy are positively correlated with being self-employed. Contrary to the previous definition, we now see that having a degree has a positive effect, mostly because we are now including professionals in our definition. Also, being married is negatively correlated to this new definition of entrepreneurs.

Since we want to capture the effect of being financially literate and risk tolerant on becoming an entrepreneur, we have to focus on younger individuals that made this decision relatively recently (we do not know exactly how long they have been in their current occupation). Similarly to what we have done in Table 4, in Table 7 we report the analysis for subsamples of individuals age 50 or below, and over 50.

[Insert Table 7 here]

Focusing on the younger subgroup, the positive correlation between being risk tolerant and financially literate and being entrepreneurs is confirmed. The same cannot be said on the older sample (only financial literacy is significant at 5 percent level, but with a lower magnitude with respect to the younger subsample).

Finally, Table 8 shows once again that the positive correlation between high risk propensity and financial literacy, and being an entrepreneur in its broader definition, hold just for men.

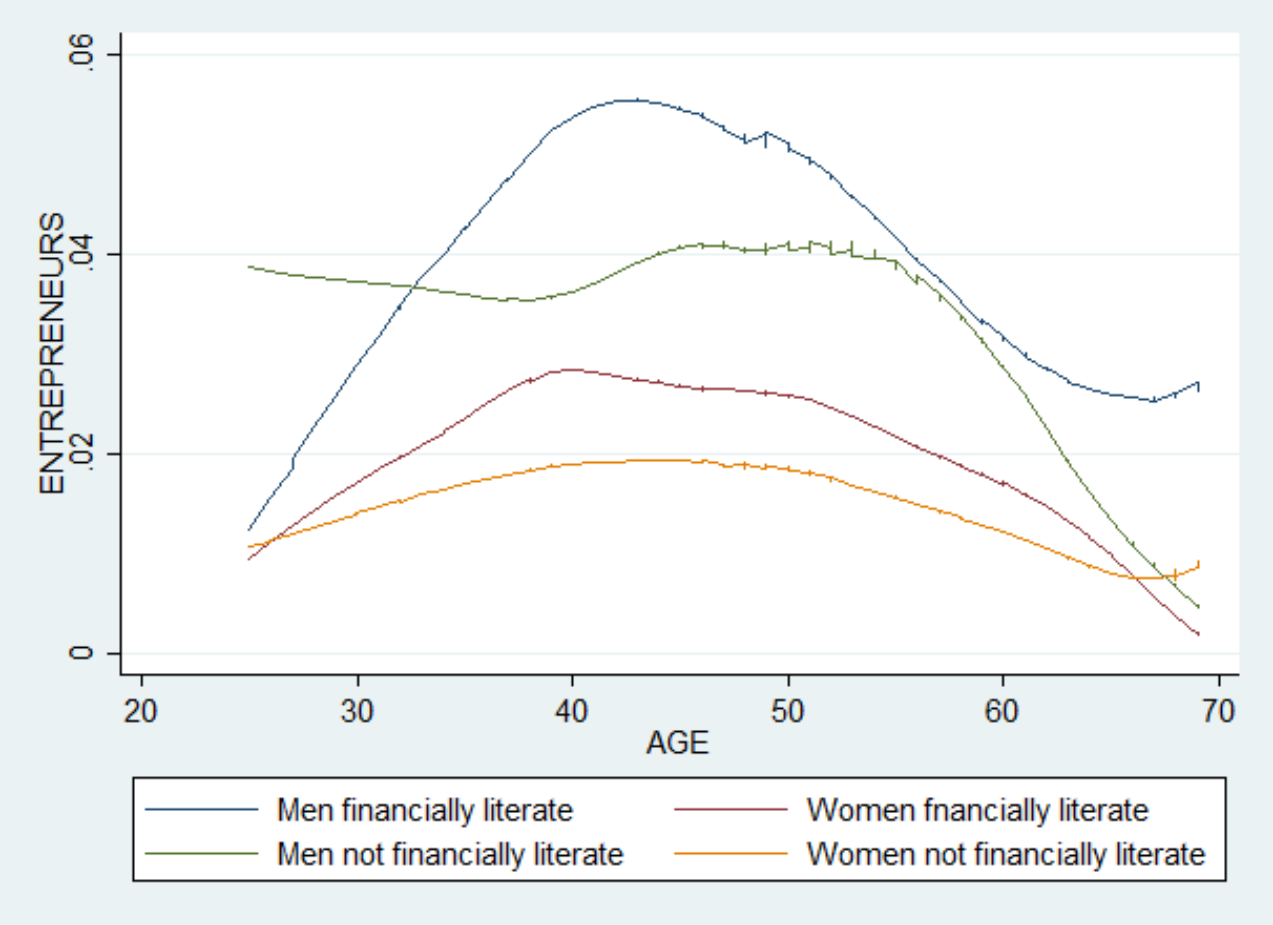
5. Concluding Remarks

This work has investigated the drivers for entrepreneurship by finding a substantial heterogeneity in the impact that risk aversion and financial literacy have on deciding of being an entrepreneurship. The heterogeneity mainly resides in gender dimension as well as age dimension. While both risk propensity and financial literacy act as an enhancer to entrepreneurship for men, the same does not hold for women, whose propensity to be an entrepreneur seems not to be obeying more financial familiarity nor being more at ease with risk attitudes. As for age, the impact of the two drivers is more pronounced for the younger cohorts, and shades away for old cohorts of entrepreneurs.

[Insert Table 8 here]

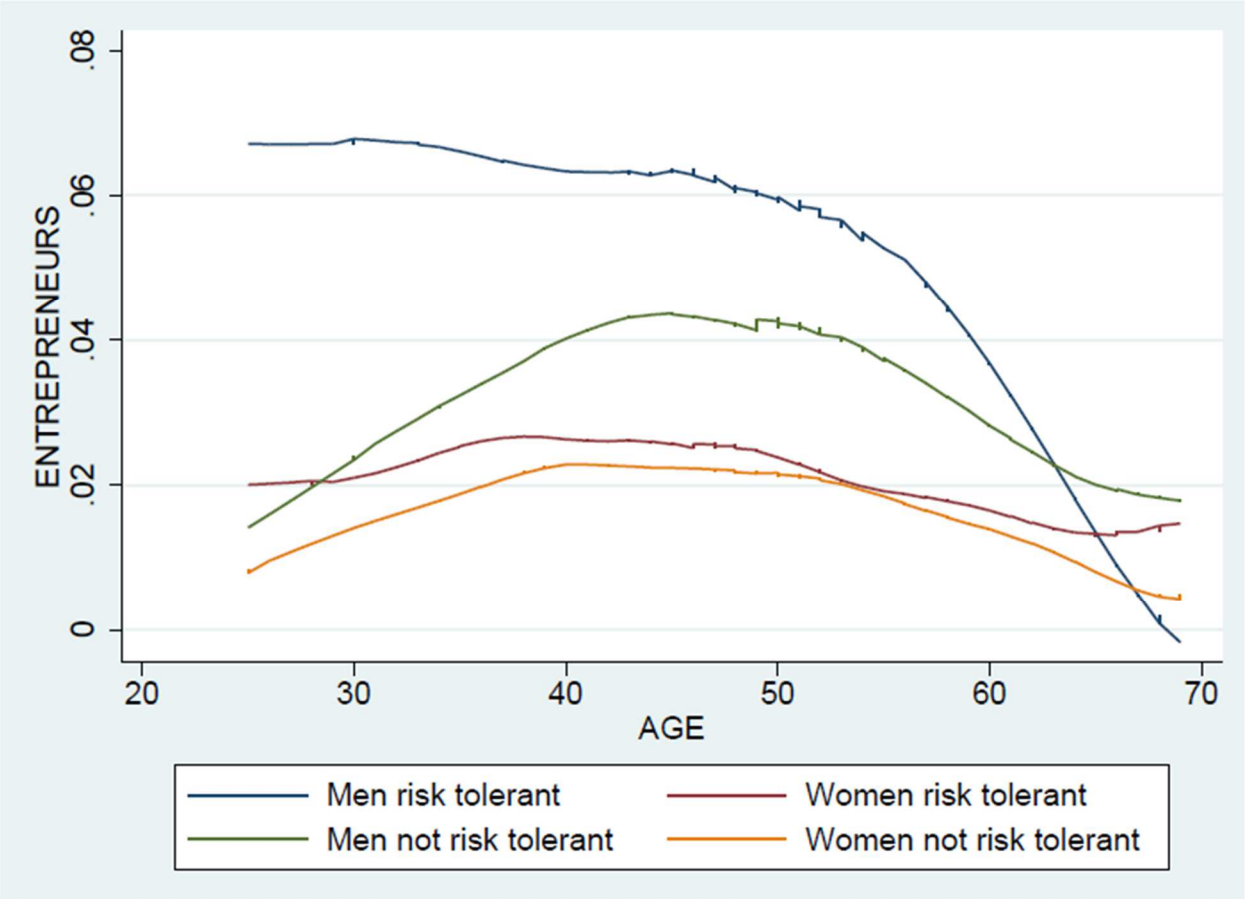
6. Tables and graphs

Graph 1



Note: The sample includes household heads or spouses/partners age 25-69 in the 2008 and 2010 SHIW (i.e. the first/last age for which number the of entrepreneurs is greater than 2).

Graph 2



Note: The sample includes household heads or spouses/partners age 25-69 in the 2008 and 2010 SHIW (i.e. the first/last age for which number the of entrepreneurs is greater than 2).

Table 1: Description of variables (n=26,032)

Variable	Description
Female	Dummy:1 if female, 0 if male
Center	Dummy:1 if living in central Italian regions, 0 otherwise
South	Dummy:1 if living in southern Italian regions or islands, 0 otherwise
Age	Age
Married	Dummy:1 if married, 0 otherwise
High school	Dummy:1 if the respondent has vocational secondary school diploma (3 years of study) or upper secondary school diploma, 0 otherwise
Degree	Dummy:1 if the respondent has 3-year university degree/higher education diploma, or 5-year university degree, or postgraduate qualification, 0 otherwise
Log Income	Logarithm of net disposable income
Risk Propensity	Dummy: 1 if the respondent said he or she has a preference for investments that offer a good return with a fair degree of protection for the invested capital (or, at the extreme, very high returns, but with a high risk of losing part of the capital), and 0 if he/she reported having a preference for a fair return, with a good degree of protection for the invested capital (or, at the extreme, low returns, with no risk of losing the invested capital)
Financial Literacy	Dummy: 1 if the respondent answered correctly to both inflation and risk diversification questions.
Entrepreneur	Dummy: 1 if the respondent is either individual entrepreneur, or owner or member of a family business

Table 1a: Description statistics

Variable	Mean	Std. dev.	Min	Max	Median
Female	0.54	0.14	0	1	1
Center	0.21	0.41	0	1	0
South	0.34	0.47	0	1	0
Age	56.80	15.23	18	103	56
Married	0.76	0.42	0	1	1
High school	0.32	0.46	0	1	0
Degree	0.10	0.30	0	1	0
Log Income	10.24	0.79	0	13.35	10.28
Risk Propensity	0.17	0.38	0	1	0
Financial Literacy	0.43	0.49	0	1	0
Entrepreneur	0.02	0.14	0	1	0

Table 2: Sample Descriptive Statistics by Gender and Age Groups

	Male (n=11,969)			**Female** (n=14,063)		
Variable	Mean	Std. dev.	Median	Mean	Std. dev.	Median
Center	0.21	0.41	0	0.21	0.41	0
South	0.34	0.47	0	0.34	0.47	0
Age	57.14	14.76	57	56.50	15.61	56
Married	0.83	0.37	1	0.70	0.46	1
High school	0.33	0.47	0	0.30	0.46	0
Degree	0.10	0.31	0	0.10	0.30	0
Log Income	10.29	0.78	10.34	10.20	0.79	10.24
Risk Propensity	0.18	0.39	0	0.17	0.37	0
Financial Literacy	0.46	0.50	0	0.42	0.49	0
Entrepreneur	0.03	0.17	0	0.01	0.12	0

	Age≤50 (n=9,730)			**Age>50** (n=16,302)		
Variable	Mean	Std. dev.	Median	Mean	Std. dev.	Median
Female	0.56	0.50	1	0.53	0.50	1
Center	0.19	0.39	0	0.22	0.41	0
South	0.36	0.48	0	0.33	0.47	0
Age	40.85	6.78	42	66.31	10.03	65
Married	0.80	0.40	1	0.74	0.44	1
High school	0.45	0.50	0	0.24	0.43	0
Degree	0.13	0.34	0	0.08	0.27	0
Log Income	10.20	0.93	10.30	10.27	0.69	10.28
Risk Propensity	0.21	0.41	0	0.16	0.36	0
Financial Literacy	0.48	0.50	0	0.41	0.49	0
Entrepreneur	0.03	0.18	0	0.01	0.12	0

Table 3. Multivariate Regression Model of the Probability of Being Entrepreneur

	Entrepreneur	Entrepreneur	Entrepreneur
Female	-0.015***	-0.015***	-0.015***
	(0.002)	(0.002)	(0.002)
Center	0.001	0.002	0.001
	(0.003)	(0.003)	(0.003)
South	0.004	0.003	0.004
	(0.003)	(0.003)	(0.003)
Age	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)
Age squared	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
Married	-0.005**	-0.005**	-0.005**
	(0.002)	(0.002)	(0.002)
High school	-0.002	-0.002	-0.003
	(0.003)	(0.003)	(0.003)
Degree	-0.017***	-0.018***	-0.019***
	(0.004)	(0.004)	(0.004)
Year 2008	-0.004**	-0.003*	-0.003*
	(0.002)	(0.002)	(0.002)
Log Income	0.014***	0.014***	0.014***
	(0.002)	(0.002)	(0.002)
Risk Propensity		0.007**	0.008**
		(0.003)	(0.003)
Financial Literacy			0.004
			(0.002)
Constant	-0.102***	-0.102***	-0.100***
	(0.020)	(0.020)	(0.020)
Observations	26,032	26,032	26,032

R-squared	0.015	0.015	0.015

Notes: Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 4. Multivariate Regression Model of the Probability of Being Entrepreneur by Age

	Full sample	**Age≤50**	**Age>50**
	Entrepreneur	Entrepreneur	Entrepreneur
Female	-0.015***	-0.023***	-0.010***
	(0.002)	(0.004)	(0.002)
Center	0.001	-0.002	0.003
	(0.003)	(0.006)	(0.003)
South	0.004	0.005	0.002
	(0.003)	(0.005)	(0.003)
Age	0.001	0.003	-0.006***
	(0.000)	(0.003)	(0.001)
Age squared	-0.000***	-0.000	0.000***
	(0.000)	(0.000)	(0.000)
Married	-0.005**	-0.001	-0.006**
	(0.002)	(0.005)	(0.002)
High school	-0.003	0.003	-0.009***
	(0.003)	(0.005)	(0.003)
Degree	-0.019***	-0.023***	-0.013**
	(0.004)	(0.006)	(0.005)
Year 2008	-0.003*	-0.004	-0.003
	(0.002)	(0.003)	(0.002)
Log Income	0.014***	0.013***	0.015***
	(0.002)	(0.002)	(0.003)
Risk Propensity	0.008**	0.011**	0.004
	(0.003)	(0.005)	(0.004)
Financial Literacy	0.004	0.010**	0.000
	(0.002)	(0.004)	(0.002)
Constant	-0.100***	-0.152***	0.113*
	(0.020)	(0.053)	(0.058)

Observations	26,032	9,730	16,302
R-squared	0.015	0.012	0.017

Notes: Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 5. Multivariate Regression Model of the Probability of Being Entrepreneur by Gender for Individuals Age 50 or Below

	Subsample Age≤50	**Male**	**Female**
	Entrepreneur	Entrepreneur	Entrepreneur
Female	-0.023***		
	(0.004)		
Center	-0.002	0.003	-0.005
	(0.006)	(0.009)	(0.006)
South	0.005	0.015*	-0.003
	(0.005)	(0.008)	(0.005)
Age	0.003	0.002	0.004
	(0.003)	(0.005)	(0.003)
Age squared	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Married	-0.001	0.012	-0.011*
	(0.005)	(0.008)	(0.006)
High school	0.003	0.006	-0.001
	(0.005)	(0.008)	(0.005)
Degree	-0.023***	-0.032***	-0.017**
	(0.006)	(0.009)	(0.007)
Year 2008	-0.004	-0.008	-0.001
	(0.003)	(0.006)	(0.003)
Log Income	0.013***	0.017***	0.010***
	(0.002)	(0.003)	(0.003)
Risk Propensity	0.011**	0.021**	0.004
	(0.005)	(0.009)	(0.005)
Financial Literacy	0.010**	0.013*	0.007
	(0.004)	(0.007)	(0.004)
Constant	-0.152***	-0.192**	-0.145***
	(0.053)	(0.090)	(0.056)

Observations	9,730	4,302	5,428
R-squared	0.012	0.014	0.006

Notes: Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6. Multivariate Regression Model of the Probability of being an Entrepreneur (Broader Definition)

	Entrepreneur	Entrepreneur	Entrepreneur
Female	-0.082***	-0.082***	-0.082***
	(0.004)	(0.004)	(0.004)
Center	0.007	0.008	0.007
	(0.006)	(0.006)	(0.006)
South	0.004	0.003	0.005
	(0.005)	(0.005)	(0.005)
Age	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)
Age squared	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
Married	-0.037***	-0.037***	-0.038***
	(0.005)	(0.005)	(0.005)
High school	0.008	0.007	0.005
	(0.005)	(0.005)	(0.005)
Degree	0.023**	0.022**	0.020**
	(0.009)	(0.009)	(0.009)
Year 2008	-0.007**	-0.006**	-0.005*
	(0.003)	(0.003)	(0.003)
Log Income	0.042***	0.042***	0.041***
	(0.004)	(0.004)	(0.004)
Risk Propensity		0.014**	0.015***
		(0.005)	(0.005)
Financial Literacy			0.016***
			(0.004)
Constant	-0.300***	-0.301***	-0.292***
	(0.040)	(0.039)	(0.039)

Observations	26,032	26,032	26,032
R-squared	0.068	0.068	0.069

Notes: Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 7. Multivariate Regression Model of the Probability of being an Entrepreneur (Broader Definition) by Age

	Full sample	**Age≤50**	**Age>50**
	Entrepreneur	Entrepreneur	Entrepreneur
Female	-0.082***	-0.119***	-0.060***
	(0.004)	(0.008)	(0.004)
Center	0.007	0.028**	-0.005
	(0.006)	(0.012)	(0.006)
South	0.005	0.018*	-0.006
	(0.005)	(0.009)	(0.005)
Age	0.004***	0.011**	-0.022***
	(0.001)	(0.005)	(0.003)
Age squared	-0.000***	-0.000*	0.000***
	(0.000)	(0.000)	(0.000)
Married	-0.038***	-0.036***	-0.031***
	(0.005)	(0.011)	(0.005)
High school	0.005	0.014	-0.002
	(0.005)	(0.009)	(0.006)
Degree	0.020**	0.026*	0.018
	(0.009)	(0.014)	(0.011)
Year 2008	-0.005*	-0.004	-0.006**
	(0.003)	(0.005)	(0.003)
Log Income	0.041***	0.040***	0.040***
	(0.004)	(0.005)	(0.005)
Risk Propensity	0.015***	0.024***	0.007
	(0.005)	(0.009)	(0.006)
Financial Literacy	0.016***	0.027***	0.009*
	(0.004)	(0.008)	(0.004)
Constant	-0.292***	-0.476***	0.581***
	(0.039)	(0.101)	(0.105)

Observations	26,032	9,730	16,302
R-squared	0.069	0.056	0.075

Notes: Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 8. Multivariate Regression Model of the Probability of being an Entrepreneur (Broader Definition) by Gender for Individuals Age 50 or Below

	Subsample Age≤50	**Male**	**Female**
VARIABLES	Entrepreneur	Entrepreneur	Entrepreneur
Female	-0.119***		
	(0.008)		
Center	0.028**	0.039**	0.020
	(0.012)	(0.020)	(0.012)
South	0.018*	0.043***	-0.002
	(0.009)	(0.016)	(0.009)
Age	0.011**	0.020**	0.007
	(0.005)	(0.009)	(0.005)
Age squared	-0.000*	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)
Married	-0.036***	-0.024	-0.045***
	(0.011)	(0.019)	(0.011)
High school	0.014	0.024	0.005
	(0.009)	(0.016)	(0.009)
Degree	0.026*	-0.011	0.050***
	(0.014)	(0.024)	(0.016)
Year 2008	-0.004	-0.002	-0.005
	(0.005)	(0.009)	(0.006)
Log Income	0.040***	0.055***	0.027***
	(0.005)	(0.007)	(0.005)
Risk Propensity	0.024***	0.047***	0.005
	(0.009)	(0.016)	(0.009)
Financial Literacy	0.027***	0.047***	0.012
	(0.008)	(0.013)	(0.008)
Constant	-0.476***	-0.871***	-0.330***
	(0.101)	(0.178)	(0.103)

Observations	9,730	4,302	5,428
R-squared	0.056	0.035	0.025

Notes: Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

7. References

Almenberg, J., and Dreber, A. 2015. Gender, stock market participation and financial literacy. Economic Letters, 137, 140–142

Atkinson, A., and Messy, F.A. 2011. Assessing financial literacy in 12 countries: An OECD/ INFE international pilot exercise. Journal of Pension Economics and Finance, 10 (4): 657–65

Begley, T.M., and Boyd, D.P. 1987. Psychological characteristics associated with performance in entrepreneurial firms and small businesses. Journal of Business Venturing, 1(2):79-93

Bianchi, M. 2018. Financial literacy and portfolio dynamics. The Journal of Finance, 73(2), 831-859

Block, J., Sandner, P., and Spiegel, F. 2015. How do risk attitudes differ within the group of entrepreneurs? The role of motivation and procedural utility. Journal of Small Business Management, 53(1), 183–206

Bonsang, E., Dohmen, T. 2015. Risk attitude and cognitive aging. Journal of Economic Behavior & Organization 112, 112–126

Borghans, L., Duckworth, A., Heckman, J., ter Weel, B., 2008. The economics and psychology of personality traits. Journal of Human Resources, 43 (4), 972–1059

Bosma, N., and Harding, R. 2006. Global entrepreneurship monitor 2006 results report. Babson Park, MA: Babson College

Brockhaus, R.H. 1980. Risk taking propensity of entrepreneurs. Academy of Management Journal 23(3), 509-520

Brown, M., and Graf, R.. 2013. Financial literacy and retirement planning in Switzerland. Numeracy, 6(2).

Bruhn, M., and Zia, B. 2011. Stimulating managerial capital in emerging markets: The impact of business and financial literacy for young entrepreneurs. World Bank Working Paper, 5642

Bucher-Koenen, T., Lusardi, A., Alessie R., Van Rooij, M. 2017. How financially literate are women? An overview and new insights. Journal of Consumer Affairs, 51(2), 255-283

Bucher-Koenen, T., and Lusardi, A. 2011. Financial literacy and retirement planning in Germany." Journal of Pension Economics and Finance, 10 (4): 565–84.

Busenitz, L.W., and Barney, J.B. 1997. Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. Journal of Business Venturing, 12, 9-30

Caliendo, M., Fossen, F., Kritikos, A., 2009. Risk attitudes of nascent entrepreneurs: new evidence from an experimentally-validated survey. Small Business Economics, 32, 153–167

Caliendo, M., Fossen, F., Kritikos, A., 2014. Personality characteristics and the decisions to become and stay self-employed. Small Business Economics, 42, 787–814

Charness, G. and Gneezy, U. 2012. Strong evidence for gender differences in risk taking. Journal of Economic Behavior & Organization, 83, 50-58

Cramer, J., Hartog, J., Jonker, N., Van Praag, C. 2002. Low risk aversion encourages the choice for entrepreneurship: An empirical test of a truism. Journal of Economic Behavior & Organization, 48, 29-36

Croson, R., and Gneezy, U., 2009. Gender difference in preferences. Journal of Economic Literature, 47 (2), 448–474

Ćumurović, A and Hyll, W. 2017. Financial literacy and self-employment, working paper

Cupák, A., Fessler, P., Schneebaum, A., Silgoner, M. 2018. Decomposing gender gaps in financial literacy: New international evidence. Economics Letters, 168, 102–106

Dew, N., Read, S., Sarasvathy, S.D. and Wiltbank, R. 2009. Effectual versus predictive logics in entrepreneurial decision-making: Difference between experts and novices. Journal of Business Venturing, 24, 287–309.

Disney, R. and Gathergood, J. 2013. Financial literacy and consumer credit portfolios. Journal of Banking & Finance, 37(7), 2246-2254

Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., Wagner, G.G., 2011. Individual risk attitudes: Measurement, determinants and behavioral consequences. Journal of the European Economic Association, 9 (3), 522–550

Dohmen, T., and Falk, A. 2011. Performance pay and multidimensional sorting: Productivity, preferences, and gender. American Economic Review, 101 (2), 556-90

Douglas, E., Shepherd, D. 2002. Self-employment as a career choice: Attitudes, entrepreneurial intentions, and utility maximization. Entrepreneurship Theory and Practice, 26, 81–90

Drexler, A., Fischer, G., and Schoar, A.. 2014. Keeping it simple: Financial literacy and rules of thumb. American Economic Journal: Applied Economics, 6 (2): 1-31

Eckel, C.C., and Grossman, P.J. 2008. Men, women and risk aversion: Experimental evidence. In: Plott, C., Smith, V. (Eds.), Handbook of Experimental Economics Results, vol. 1. Elsevier, New York, pp. 1061–1073, Chapter 113.

Elston, J.A., and Audretsch, D.B. 2010. Risk attitudes, wealth and sources of entrepreneurial start-up capital. Journal of Economic Behavior & Organization, 76, 82–89

Elston, J.A., and Audretsch, D.B. 2011. Financing the entrepreneurial decision: an empirical approach using experimental data on risk attitudes. Small Business Economics, 36, 209-222

Fernandes, D., Lynch Jr., J.G., Netemeyer, R.G., 2014. Financial literacy, financial education, and downstream financial behaviors. Management Science, 60 (8), 1861–1883

Fonseca, R., Mullen, K.J., Zamarro, G., and Zissimopoulos, J. 2012. What explains the gender gap in financial literacy? The role of household decision making. Journal of Consumer Affairs, 46 (1): 90–106

Forlani, D., and Mullins, J.W. 2001. Perceived risks and choices in entrepreneurs' new venture decisions. Journal of Business Venturing, 15, 305–322

Hilgert, M.A., Hogarth, J.M, and Beverly, S.G. 2003. Household financial management: The connection between knowledge and behavior. Federal Reserve Bulletin, 89 (7): 309–22

Hsu, J. W. 2011. Aging and strategic learning: The impact of spousal incentives on financial literacy. Finance and Economics Discussion Series 2011-53. Board of Governors of the Federal Reserve System. Washington, DC

Hsu, D. K., Wiklund, J., Cotton, R.G. 2017. Success, failure, and entrepreneurial reentry: An experimental assessment of the veracity of self-efficacy and prospect theory. Entrepreneurship Theory and Practice, 41(1), 19–47

Huang, L., and Pearce, J.L. 2015. Managing the unknowable: The effectiveness of earlystage investor gut feel in entrepreneurial investment decisions. Administrative Science Quarterly, 60(4), 634–670

Jappelli, T., and Padula, M. 2015. Investment in financial literacy, social security, and portfolio choice. Journal of Pension Economics and Finance, 14(4), 369-411

Jianakoplos, N., and Bernasek, A., 1998. Are women more risk-averse? Economic Inquiry, 36, 620–630

Kahneman, D., and Tversky, A. 1979. Prospect theory: An analysis of decision under risk. Econometrica: Journal of the Econometric Society, 47(2), 263–291

Kan, K., and Tsai, W.D. 2006. Entrepreneurship and risk aversion. Small Business Economics, 26, 465–474

Kanbur, S.M. 1979. Of risk taking and the personal distribution of income. Journal of Political Economy, 87, 760–797

Keh, H.T., Foo, M.D., Lim, B.C., 2002. Opportunity evaluation under risky conditions: The cognitive processes of entrepreneurs. Entrepreneurship Theory and Practice, 27, 125–148

Kihlstrom, R.R. and Laffont, J.J. 1979. A general equilibrium entrepreneurial theory of new firm formation based on risk aversion. Journal of Political Economy, 87, 304–316

Klapper, L., Lusardi, A., and Panos, G. A. 2013. Financial literacy and its consequences: Evidence from Russia during the financial crisis. Journal of Banking & Finance, 37(10), 3904-3923

Knight, F.H. 2002. Risk, uncertainty and profit. Washington, DC: Beard Books.

Langowitz, N., and Minniti, M. 2007. The entrepreneurial propensity of women. Entrepreneurship Theory and Practice, 31, 341-364

Lusardi, A., and Mitchell, O.S. 2014. The economic importance of financial literacy: Theory and evidence. Journal of Economic Literature, 52(1), 5-44

Lusardi, A., and Tufano, P., 2009. Debt literacy, financial experiences, and overindebtedness. NBER Working Paper No. 14808.

Lusardi, A., and Mitchell, O.S. 2008. Planning and financial literacy: How do women fare? American Economic Review, 98 (2): 413–17

Lusardi, A., and Mitchell, O.S. 2011. Financial literacy and retirement planning in the United States. Journal of Pension Economics and Finance, 10 (4), 509–25

Lusardi, A., and Mitchell, O.S., 2007. Baby boomers retirement security: The role of planning, financial literacy and housing wealth. Journal of Monetary Economics, 54, 205–224.

Lusardi, A., Mitchell, O.S and Curto, V. 2010. Financial literacy among the young. Journal of Consumer Affairs, 44 (2): 358–80

Lusardi, A., Mitchell, O.S and Curto, V. 2014a. Financial literacy and financial sophistication in the older population. Journal of Pension Economics and Finance, 13(4), 347-366.

Lusardi, A., Mitchell, O.S., 2008. Planning and financial literacy: how do women fare? American Economic Review 98, 413–417

Lusardi, A., and Mitchell, O.S. 2007b. Financial literacy and retirement preparedness: evidence and implications for financial education. Business Economics, 42(1), 35–44.

Lusardi, A., and Mitchell, O.S 2011a. Financial literacy and planning: implications for retirement well-being. In Financial Literacy: Implications for Retirement Security and the Financial Marketplace, edited by Olivia S. Mitchell and Annamaria Lusardi, 17–39. Oxford and New York: Oxford University Press.

Lusardi, A. 2011. Americans' financial capability. National Bureau of Economic Research Working Paper 17103.

Lusardi, A., Michaud, P.C., and Mitchell, O.S. 2017. Optimal financial knowledge and wealth inequality. Journal of Political Economy, 125 (2), 431-477

Lusardi, A. and Mitchell, O.S. 2011b. Financial literacy around the world: An overview. CeRP Working Papers. Center for Research on Pensions and Welfare Policies, Turin (Italy), March.

March, J.G., and Shapira, Z. 1987. Managerial perspectives on risk and risk taking. Management Science, 33 (11), 1404–1418

McCarthy, B. 2000. The cult of risk taking and social learning: A study of Irish entrepreneurs. Management Decision, 38(8), 563–575

Miller, K.D. 2007. Risk and rationality in entrepreneurial processes. Strategic Entrepreneurship Journal, 1, 57–74

Mottola, G.R., 2013. In our best interest: Women, financial literacy, and credit card behavior. Numeracy, 6 (02), 4

Mullins, J.W., and Forlani, D. 2005. Missing the boat or sinking the boat: A study of new venture decision making. Journal of Business Venturing, 20(1), 47–69

Niederle, M., and Vesterlund, L. 2007. Do women shy away from competition? Do men compete too much? Quarterly Journal of Economics, 122, 1067–1101

Norton, W., and Moore, W. 2006. The influence of entrepreneurial risk assessment on venture launch or growth decision. Small Business Economics, 26, 215–226

Organisation for Economic Co-operation and Development (OECD). 2005. Improving financial literacy: Analysis of issues and policies. Paris and Washington, D.C.: Organisation for Economic Co-operation and Development.

Organisation for Economic Co-Operation and Development (OECD). 2013. Financial literacy and inclusion: Results of OECD/INFE survey across countries and by gender. OECD Publishing.

Palich, L.E., and Bagby, D.R. 1995. Using cognitive theory to explain entrepreneurial risk-taking: Challenging conventional wisdom. Journal of Business Venturing, 10, 425–438

Palmer, M. 1971. The application of psychological testing to entrepreneurial potential. California Management Review, 13(3), 1970-1971

Potrich, A.C.G., Vieira, K.M., Coronel, D.A., Bender Filho, R., 2015. Financial literacy in Southern Brazil: Modeling and invariance between genders. Journal of Behavioural Experimental Finance, 6, 1–12

Rauch, A., Wiklund, J., Lumpkin, G. T., Frese, M. 2009. Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. Entrepreneurship Theory and Practice, 33(3), 761–787

Shepherd D.A, Williams, T.A, Patzelt, H. 2014. Thinking about entrepreneurial decision making: Review and research agenda. Journal of Management, 41 (1), 11-46

Stango, V., and Zinman, J. 2009. Exponential growth bias and household finance. The Journal of Finance, 64(6), 2807–2849

Stewart, W.H., and Roth, P.L. 2001. Risk propensity differences between entrepreneurs and managers: A meta-analytic review. Journal of Applied Psychology, 86(1), 145–153

Sundén, A., and Surette, B. 1998. Gender differences in the allocation of assets in retirement savings plans. American Economic Review Papers and Proceedings, 88, 207–211

Teoh Y.T., and Foo, S.L. 1997. Moderating effects of tolerance for ambiguity and risk taking propensity on the role conflict- perceived performance relationship: Evidence from Singapore Entrepreneurs. Journal of Business Venturing, 12, 1, 67-81

Van Rooij, M., Lusardi, A., Alessie, R. 2011. Financial literacy and stock market participation. Journal of Financial Economics, 101(2), 449–472

Van Rooij, M.C.J., Lusardi, A., and Alessie, R. 2012. Financial literacy, retirement planning and household wealth. The Economic Journal, 122(560), 449-478.

Zhang, S.X, and Quieto, J. 2017. The study of bias in entrepreneurship. Entrepreneurship Theory and Practice, 41 (3), 419-454