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THE ATTITUDE TOWARD THE RISK OF ENTREPRENEURIAL ACTIVITY: EVIDENCE FROM CHILE

LA ACTITUD HACIA EL RIESGO DE EMPRENDER: EVIDENCIA PARA CHILE

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ABSTRACT

We study the factors that may influence the attitude toward the risk of entrepreneurial activity and its impact on the propensity to become an entrepreneur. We proxy the attitude toward risk by using the answers to the fear of failing question contained in the Global Entrepreneurship Monitor survey. Interesting results are found. First, we found that being male, having more years of formal education and believing to have the necessary skills to develop a new venture all have a negative effect on an individual's attitude toward risk and therefore, increase the probability of becoming an entrepreneur. Age affects the risk in a quadratic way (first positive but after some point negative). Finally, contrary to conventional wisdom, having the experience of shutting down a business has no effect on the risk's attitude for developing a new venture in the Chilean case.

Key words: Fear of failing, risk aversion, entrepreneurship, GEM.

RESUMEN

Estudiamos los factores que pueden influenciar la actitud hacia el riesgo de emprender y su impacto en la propensión a ser un emprendedor en Chile. Usamos como *proxy* de la actitud hacia el riesgo de emprender la respuesta a la pregunta respecto al miedo a fallar que se encuentra en el cuestionario del Global Entrepreneurship Monitor (GEM, por sus siglas en inglés). Encontramos que las variables ser hombre, tener más años de educación formal y que la persona crea que posee las habilidades necesarias para desarrollar una empresa tienen una relación negativa con el miedo a fallar, y por tanto incrementan la probabilidad de llegar a ser un emprendedor. Encontramos además que la edad afecta la actitud hacia el riesgo de emprender de forma cuadrática (primero de forma positiva pero después de cierta edad de forma negativa). Finalmente, y contrario a lo esperado, haber fracasado en un emprendimiento no tiene efecto en la actitud hacia el riesgo de emprender.

Palabras clave: miedo a fallar, aversión al riesgo, emprendimiento, GEM.

1. Introduction

Much of the empirical research on entrepreneurship has focused on explaining the determinants of entrepreneurship, or correlating entrepreneurship and economic growth. In this paper, we analyze some factors that can explain one of the precursors of entrepreneurship, which is the individual's attitude toward risk. This is how willing an individual is to bear the risk inherent to becoming an entrepreneur. The entrepreneurship literature has shown that from a theoretical point of view, more risk averse individuals should become workers, while the less risk averse are likely to become entrepreneurs (Kihlstrom & Laffont, 1979). From an empirical point of view, the attitude towards risk has been taken into account as a determinant of entrepreneurship (Ardagna & Lusardi, 2008). However, no attention has been paid, neither theoretically nor empirically, to the determinants of that attitude toward the risk of starting a new business. This research intends to make a contribution in reducing this gap.

Our objective is to determine what are the factors, at the individual level, that affect the attitude toward the risk of starting a new business. We want to know whether age, gender, and educational level, among others, can help to differentiate among individuals more or less willing to bear the risk of becoming entrepreneurs. To this end, we take advantage of a question in the Adult Population Survey (APS) within the Global Entrepreneurship Monitor (GEM) survey that ask individuals whether "fear of failure would prevent them from starting a new business". This is a yes or no question, which we use to model "fear of failure" as a proxy for the attitude toward risk.

We estimate a Probit model that can correctly predict about 61% of the time, whether an individual has more or less "fear of failing". We find that: women have more fear of failing (which we interpret as risk aversion) than men do. Each extra year of education above the mean of the sample can decrease the probability of feeling fear of failing by 0.7%. Individuals who believe they have the skills necessary to be entrepreneurs have a 14% lower probability of feeling fear of failing. Individuals with a previous failure or individuals who know a nascent entrepreneur are not more likely to experience fear of failure.

The paper continues with Section 2 where we present a brief review of the related literature. In Section 3 we present the sample and method used in this research. In Section 4 we show the results, and finally in Section 5 we provide the conclusions.

2. Literature review

Entrepreneurship is a key element in the growth of nations. The entrepreneur's role in the process of development has long been emphasized in the literature. Schumpeter (1926/1934) argues that the existence of entrepreneurs, who innovate, generates the process of "creative destruction" by which new firms replace the old ones through efficiency improvements, which results in higher levels of productivity and competition. Kirzner (1973, 1979) highlights the role of the entrepreneur as the one who is able to recognize opportunities where the lay person cannot see any. Knight (1921/1971) recognizes the entrepreneur as a leader who organizes inputs of productions, and is willing to confront the uncertainty that characterizes a new endeavor.

More recently Baumol (2002) argues that the entrepreneurial spirit is the main factor explaining the "growth miracle of capitalism". Through innovation, the entrepreneur is then the engine of growth. Acs (2006) explains how is entrepreneurship good for economic growth. By separating necessity entrepreneurs (those who become entrepreneurs because no other option is available) from opportunity entrepreneurs (those who become entrepreneurs looking for a profitable opportunity), Acs documents that the first type of entrepreneurship has no effect on economic development, while the second has a positive and significant effect on economic development and growth.

Given the importance of entrepreneurship on economic growth, most of the recent work has focused on the determinants of the entrepreneurial activity, in particular on the role of individual characteristics on entrepreneurship. For instance, Evans and Jovanovic (1989)

investigate the link between initial wealth and the choice of becoming an entrepreneur. Holtz-Eakin, Joulfaian and Rosen (1994) inspect the relationship between access to capital and entrepreneurial survival. Johnson, McMillan, and Woodruff (2002) analyze the nexus between property rights and entrepreneurship. Lerner and Malmendier (2007) study the effect of entrepreneurial peers on entrepreneurship rates. Giannetti and Simonov (2007) examine the effect of social interactions on the levels of entrepreneurial activity, and Ardagna and Lusardi (2008) explain international differences in entrepreneurship by highlighting the role of individual characteristics and regulatory constrains.

The theoretical literature on the choice to become an entrepreneur puts the emphasis on risk aversion. Indeed, since the work of Knight (1921/1971) who emphasizes the "willingness [and] power to give satisfactory guarantees", that is the willingness to bear risk, as a fundamental factor determining the supply of entrepreneurs, the literature describes entrepreneurship as the result of choosing between working for someone else (low-risk activity) and self-employment (high-risk activity). Within this notion, Kihlstrom and Laffont (1979) develop a model where, in equilibrium, more risk averse individuals choose to be workers while the less risk averse become entrepreneurs. Kanbur (1979) develops a general equilibrium model whose predictions dispute Friedman's (1953) claim that different attitude toward risk results in income inequality. Cressy (2000) proposes that the positive effect of wealth on business start-ups, as advanced by Evans and Jovanovic (1989) and corroborated by most of the empirical literature, may be the result of decreasing absolute risk aversion (DARA). Kan and Tsai (2006) empirically prove Cressy's argument and find that Evans and Jovanovic's claim is robust to the inclusion of risk aversion.

All the previous discussion is on the effect of risk aversion or, in general, attitudes toward risk on the decision to become an entrepreneur. Indeed, the attitude toward risk of an individual is a key precursor of entrepreneurial activity. For this reason it is important to study and understand what factors can influence attitudes toward risk. To our knowledge, no empirical work has been done on the factors that affect an individual's attitudes toward risk and their choice to become an entrepreneur. Ardagna and Lusardi (2008) use a proxy for risk aversion as an explanatory variable when explaining international differences in entrepreneurship levels, and Cramer, Hartog, Jonker and Van Praag (2002) use Dutch data to show that risk aversion negatively affects entrepreneurship. Both studies support the prediction of the Kihlstrom and Laffont model, which is, higher levels of risk aversion negatively affects entrepreneurial activity.

In this paper we present an empirical investigation aimed at shedding light on the factors that affect an individuals attitude toward the risk that becoming an entrepreneur conveys.

3. Sample method

The GEM is an international research program started in 1999 that collects, annually, cross-country harmonized data on entrepreneurship. The project consists of two surveys (i) the Adult Population Survey (APS), and the (ii) Expert Questionnaire Data.

The APS surveys about 2,000 individuals, selected at random, from each of the participating countries. The number of surveyed countries has increased from 10 in 1999 to 42 in 2007.

The GEM project contains, among several questions, a query that asks individuals: "fear of failure would prevent you from starting a business?" We use the answers to this question as a proxy for the attitude toward risk of the individual answering the survey. We consider that the person who answers yes to this query is less willing to bear the risk of becoming an entrepreneur than the person who answers no. We use data from the APS applied in Chile in 2005. We do not study here international differences among individuals in different countries. That is out of the scope of this paper and is left for future research. For now, we only care about this application to Chile and the policy recommendation we can infer from these results.

Chile is an interesting case for the study of entrepreneurship for several reasons. First, the

Chilean economy deeply adheres to a free market model in Latin America. In this model, private enterprise and entrepreneurial activity are the key elements that move the economic system. For example, the 2009 National Bicentennial Survey of the Universidad Catolica de Chile shows that 81% of the Chilean people think that the way to overcome poverty is through individual efforts and work, and therefore, it is not a matter of government intervention. Secondly, Chile has high indexes of institutional quality (see Fraser Institute) and economic freedom (see Heritage Foundation) that differentiate it from most other Latin American countries. For instance, in Venezuela or Argentina, the entrepreneurs must always ask themselves how stable the rules of the game are before they decide to invest, or if the property rights are going be threatened in the near future. These political considerations are not present in the Chilean case and therefore, using Chile as an example allows us to observe the behavior of the determinants of the attitude toward the risk without noise. Finally, this article will try to affect policy in Chile and for this reason we also want to keep the focus in this country in order to maximize the impact of the proposals.

3.1. Estimation

The answers to the "fear of failing" question can only take the values of 1 (if answer is yes) and 0 (if answer is no). For this reason, we estimate the following Probit model:

$$FF_i = \gamma_0 + \gamma_1 AGE_i + \gamma_2 AGE_i^2 + \gamma_3 WOMEN_i + \gamma_4 SUSKILL_i + \gamma_5 EDUC_i + \gamma_6 CLOSE_i + \gamma_7 KNOWENT_i + \varepsilon_i \quad (1)$$

where i denotes each individual on the survey, *FF* is a dummy variable that represents the answer to the question: Fear of failure would prevent you from starting a business?, *AGE* represents the age, in years, of the individual answering the survey. The life-cycle risk aversion hypothesis predicts that risk aversion increases with age. The older a person becomes, the lower the risk tolerance. We include age to investigate whether this hypothesis applies to the attitude toward the risk of entrepreneurial activity. AGE^2 allows us to capture a possible non-linear relationship.

WOMEN is a dummy variable equal to 1 if the person is a female, and 0 otherwise. We include women because there are several studies that show women to be more risk averse than men. For instance, Jianakoplos and Bernasek (1998) find that women tend to choose safer choices when confronting financial risk, and Hersch (1996) shows that women are more risk averse than men when confronting consumer decisions such as smoking, seat-belt use, dental care and exercise.

SUSKILL is a dummy variable that equals 1 if the person agrees with the following sentence "You have the knowledge, skill and experience required to start a new business", and 0 otherwise. A rational individual that believes they have the necessary skills to start a new business should feel more confident about becoming an entrepreneur, in consequence they should feel less fear of failing.

EDUC represents years of formal education of the person answering the survey. It ranges from a minimum of 10 to a maximum of 18 years of education. Intuition indicates that as the individual becomes more educated, they are able to make more informed decisions, and thus face less fear of failing. Riley and Show (1992) show than once controlling for several demographics characteristics, education is negatively related to risk taking on financial decisions. That is, more educated individuals are less risk averse with respect to financial decisions.

CLOSE is a dummy which equals 1 if the person has, in the past 12 months, shut down, discontinued or quit a business they owned and managed, and 0 otherwise. We have no prior knowledge about the effect of this variable on the attitude toward the risk of becoming an entrepreneur. However, we see two potential and opposite effects. On one side, persons who recently shut down a business could be more prone to feeling fear of a new failure because of the material losses they have just endured. On the other side, the experience of going through a shut down may increase their stock of experience and thus decrease fear of failure in the future. Shepherd (2003) shows how business failure can become a positive experience

for future endeavors. Sitkin (1992) indicates that failure is more important than success as a source for learning.

KNOWENT is a binary variable that takes the value of 1 if the individual personally knows someone who started a business in the past two years. We believe that knowing an entrepreneur may help to decrease anxiety about the process of becoming an entrepreneur and thus eventually decreasing fear of failure.

Finally, ε is a normally distributed disturbance with mean 0 and unit variance.

Table 1 presents a summary of the data.

TABLE 1. Data summary.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Fear of failure (fearfail)	1194	0.3903	0.4880	0	1
Age	1868	43.612	16.441	18	90
Women	1868	0.6676	0.4712	0	1
Skills (suskill)	1185	0.6599	0.4739	0	1
Education (educ)	1865	13.496	3.2086	10	18
Closed before (close)	1865	0.0809	0.2728	0	1
Know someone (knowent)	1204	0.4518	0.4978	0	1

4. Results

As a preview of the estimation of equation (1), we obtain the pair-wise correlation among the variables as shown in Table 2. As can be seen, in most cases the correlation is significantly different from zero at conventional levels, and none is sufficiently high to make colineality a problem.

Table 3 displays the results of estimating equation (1). As can be seen, the model in its three specifications is capable of correctly classifying about 61% of the outcomes. The first row shows the model without the variables *CLOSE* and *KNOWENT*. We can observe that age affects fear of failing in a quadratic way. When young, a person experiences an increase in the probability of feeling fear of failing for each yearly increase in their age. However, after about 50 years of age (in our sample), the probability of feeling fear of failing goes down as their age increases. This is interesting because as stated before, the life-cycle risk aversion hypothesis argues that risk aversion increases with age, and we find here that this increase is only up to one point where the effect of age becomes negative. A possible explanation for this is that age may actually be capturing a wealth effect. Indeed, we do not have a proxy for wealth in the APS, and if wealth is positively correlated with age, then higher levels of wealth may reduce the person's dependency on the future flows of the project. In this sense the individual may experience lower levels of "fear of failing" because a failure would not mean financial disaster. Table 4 presents the marginal effects of the estimates, which is how a change in the independent variable affects the probability of feeling fear of failing. These effects are evaluated at the average age, 43 years old in the

TABLE 2. Correlation matrix.

	Fearfail	Age	Women	Suskill	Educ	Close	Knowent
Fearfail	1.0000						
Age	-0.0616	1.0000					
	(0.0026)						
Women	0.1201	0.0410	1.0000				
	(0.0000)	(0.0123)					
Suskill	-0.1001	-0.1167	-0.1404	1.0000			
	(0.0000)	(0.0000)	(0.0000)				
Educ	-0.0665	-0.0344	-0.0719	0.0934	1.0000		
	(0.0012)	(0.0363)	(0.0000)	(0.0000)			
Close	0.0416	-0.0549	-0.0315	0.1202	0.0473	1.0000	
	(0.0424)	(0.0008)	(0.0545)	(0.0000)	(0.0040)		
Knowent	-0.0084	-0.2139	-0.1263	0.2932	0.0965	0.1228	1.0000
	(0.6837)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	

Numbers in parenthesis are p-values for the null hypothesis that the correlation is zero.

TABLE 3. Coefficient estimates.

	Constant	Age	Age²	Women	Suskill	Educ	Close	Knowent	CC
Fearfail	-0.7230	0.0402	-0.0004	0.2881	-0.3696	-0.0200			61.74%
	(0.022)**	(0.001)***	(0.001)***	(0.000)***	(0.000)***	(0.098)*			
Fearfail	-0.6873	0.0388	-0.0004	0.2914	-0.3801	-0.0217	0.1560		61.22%
	(0.030)**	(0.002)***	(0.001)***	(0.000)***	(0.000)***	(0.075)*	(0.170)		
Fearfail	-0.7059	0.0384	-0.0004	0.3038	-0.3980	-0.0244	0.1578	0.1103	61.63%
	(0.028)**	(0.002)***	(0.001)***	(0.000)***	(0.000)***	(0.047)**	(0.176)	(0.177)	

Numbers in parenthesis are p-values. *, **, ***: significant at the 90%, 95%, and 99% confidence level respectively. CC corresponds to the proportion of outcomes correctly classified by the Probit model.

TABLE 4. Marginal effects.

	Age	Age²	Women	Suskill	Educ	Close	Knowent
dF/dx	0.0154	-0.0002	0.1086	-0.1430	-0.0077		
	(0.001)***	(0.001)***	(0.000)***	(0.000)***	(0.098)*		
dF/dx	0.0148	-0.0002	0.1098	-0.1470	-0.0083	0.0606	
	(0.002)***	(0.001)***	(0.000)***	(0.000)***	(0.075)*	(0.170)	
dF/dx	0.0147	-0.0002	0.1143	-0.1539	-0.0093	0.0613	0.0422
	(0.002)***	(0.001)***	(0.000)***	(0.000)***	(0.047)**	(0.176)	(0.177)

Numbers in parenthesis are p-values. *, **, ***: significant at the 90%, 95%, and 99% confidence level respectively. dF/dx corresponds to the marginal effect of a change in the independent variable, evaluated at the mean of the variable. For dummy variables, dF/dx is for discrete change from 0 to 1.

sample. As can be seen, each year of age over 43 increases the probability of fear of failing by 1.5%, and after 50 years of age this probability goes down by 0.14% (50-43 x 0.02%). Figure 1 shows the marginal effects of age on the probability of feeling fear of failing for both men and women.

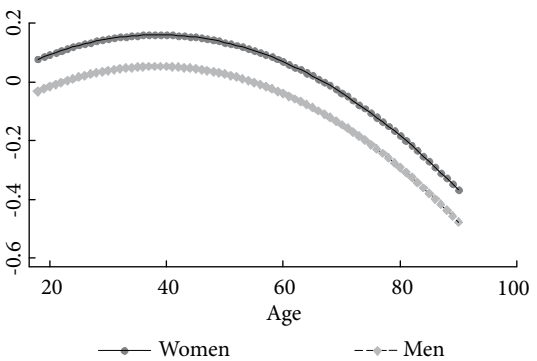

FIGURE 1. Change in probability of fear of failing by age (marginal effects).

The dummy *WOMEN* is statistically significant and has a positive sign, which indicates that women feel more fear of failing than men. In this sense, women would be more risk averse than men with respect to becoming an entrepreneur. Indeed, the probability of feeling fear of failing increases by about 11% if the person is a woman. The result is in line with the studies reviewed before which show that women are more risk averse than men in different contexts. This should be one of the factors explaining why women tend to embrace entrepreneurial activity at lower rates than men. For instance, the GEM report of 2008 shows that for all the countries surveyed that year, the total entrepreneurship activity is smaller for women.

The variable *SUSKILL* is also statistically significant at conventional levels and clearly shows that people that believe they have the skills necessary to start a new business are less likely to experience fear of failing. In quantitative terms, this is the most important factor affecting the probability of experiencing fear of failing. If an individual believes that they have the knowledge and skill necessary to start a new business, then the probability of feeling fear of failing decreases by about 15%. We do not know what each person believes are the necessary skills to start a new business, but arguably they should include education, which we control for, experience, and personal psychological characteristics.

With respect to education levels (*EDUC*), we obtain a negative and significant marginal effect. In the sample, years of education range from 10 to 18 years, and the marginal effects indicate that for each extra year of formal education above the average (13 years), the probability of experiencing fear of failing decreases by 0.77%. Thus, a person with 18 years of formal education decreases the probability of fear of failing by 3.85%. Figure 2 shows the marginal effects for men and women for each year of education. This finding about education and the attitude toward the risk of entrepreneurial activity corroborates those of Riley and Show (1992) and Halek and Eisenhauer (2001), who find a negative relationship between education levels and risk aversion in a different context.

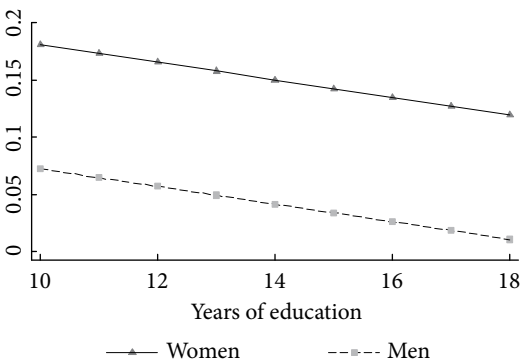

FIGURE 2. Change in probability of fear of failing by years of education (marginal effects).

The second and third rows of Tables 3 and 4 show the estimated coefficients and marginal effects when including the *CLOSE* and *KNOWENT* variables. In both cases, the newly included variables are not significantly different from zero at conventional levels.

In the three different specifications, the model is able to correctly classify about 61% of the outcomes.

5. Conclusions and policy recomendations

We have tried to contribute to the existing gap in the entrepreneurship literature by studying the determinants of fear of failing (a proxy for attitude toward risk) as a precursor of entrepreneurship. In doing so we have used the GEM data for Chile in a Probit framework finding interesting results. Our results indicate that women are more likely to experience fear of failing than men, and age has a non-linear relationship with fear of failing. Increments in years of formal education has a negative impact on the probability of feeling fear of failing, but the factor that affects the probability of fear of failing the most is the self-perceived skills that the individual believes they have.

These results suggest interesting policy recommendations in order to advance an entrepreneurial society in Chile. First, years of schooling positively affect an entrepreneurial attitude. This gives policy makers an additional reason to improve education coverage and reducing the dropout rate at any level of education. Second and more important, entrepreneurial education seem to be one of the key elements to further the Chilean entrepreneurial society. This means that it may be worth evaluating a public policy that introduces high school students to the principles of entrepreneurship as a first contact with the subject. Such early contact may predispose individuals to entrepreneurial activities in adulthood. Entrepreneurship education seems to be a key determinant for the fear of failure and therefore for the advance of an entrepreneurial society.

Specific policy programs that help build the necessary skills to develop a new venture become very important for the generation of new entrepreneurs. A minimum level of financial literacy should be a requirement for any high school graduate. However, programs that introduce the principles of business administration, which are focused in specific groups like young unemployed workers or housewives who want to start a small family business as a second source of income, should be developed seriously.

We are not saying that the help given by the welfare agencies are not important to mitigate the effects of poverty and unemployment, but we want to point out the importance of the self-perceived skills that individuals have, that gives them an alternative to the idea of "looking for a job", and that is the possibility of starting a new small venture.

Some limitations of our study are: Firstly, we do not have all the co-variates we would like to control for in the GEM database. For instance, wealth and personal income are two variables that probably affect a person's attitude toward risk. Secondly, we have no way of knowing what the respondent thinks "the necessary skills to start a new business" are. We think that these skills are related to the field of business administration and involve a minimum level of finance literacy. However, a more precise definition would be helpful especially when it comes to choose the public policy that is supposed to advance entrepreneurship. It would be of interest if the GEM survey could expand the survey in this respect.

We believe that this study advances the entrepreneurship literature by being the first piece of work to empirically put attention to the factors that may affect, at the individual level, the attitude toward the risk of starting a new business. This research should enhance our understanding of the entrepreneurship process through the empirical study of one of its key precursors: risk aversion. For instance, if we want to increase entrepreneurship rates among women, we must, besides opening opportunities for them, tackle their higher levels of risk aversion.

Future research should develop models that can theoretically explain why factors such as age, gender, and education, to name a few, affect the attitude toward the risk of becoming an entrepreneur. Besides, future research should also account for international comparisons of the determinants of the attitude toward risk. Specific characteristics of some countries that have high political risk should be of special interest for researchers in the field of entrepreneurship. This is a necessary exercise if we want to have a global view of the factors affecting the decision to start a new venture.

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RECEPCIÓN CORRECCIONES: 15/06/2010
ENVÍO EVALUACIÓN A AUTORES: 02/08/2010
RECEPCIÓN CORRECCIONES: 03/08/2010
ACEPTACIÓN ARTÍCULO: 28/09/2010