Climbing the Entrepreneurial Ladder:
The Role of Gender

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ABSTRACT AND KEYWORDS	
Abstract	We investigate whether women and men differ with respect to the steps they take in the entrepreneurial process, distinguishing between five successive steps described by the following positions: (1) "never thought about it"; (2) "thinking about starting up a business"; (3) "taking steps to start a business"; (4) "running a business for less than three years"; (5) "running a business for more than three years". This paper provides insights into the manner in which women and men climb the entrepreneurial ladder and the factors that influence their position on the ladder. We use data from the 2006 "Flash Eurobarometer survey on Entrepreneurship" consisting of more than 10,000 observations for 25 member states of the European Union, Norway, Iceland and the United States. Findings suggest that for men it is easier to climb the ladder and that this may be attributed partly to their higher tolerance of risk.
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Climbing the entrepreneurial ladder: the role of gender

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Abstract: We investigate whether women and men differ with respect to the steps they take in the entrepreneurial process, distinguishing between five successive steps described by the following positions: (1) "never thought about it"; (2) "thinking about starting up a business"; (3) "taking steps to start a business"; (4) "running a business for less than three years"; (5) "running a business for more than three years". This paper provides insights into the manner in which women and men climb the entrepreneurial ladder and the factors that influence their position on the ladder. We use data from the 2006 "Flash Eurobarometer survey on Entrepreneurship" consisting of more than 10,000 observations for 25 member states of the European Union, Norway, Iceland and the United States. Findings suggest that for men it is easier to climb the ladder and that this may be attributed partly to their higher tolerance of risk.

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1. Introduction

The decision to become an entrepreneur is traditionally seen as an occupational decision with two outcomes: to engage or not to engage in entrepreneurial activity (Lazear, 2005). This 'static' perspective has been challenged by a more 'dynamic' view which sees entrepreneurship as a process that consists of several stages (Reynolds, 1997; Grilo and Thurik, 2008), which will be influenced by different factors (Davidsson and Honig, 2003). Generally, a distinction can be made between a pre-birth, birth and post-natal stage of a company. Van der Zwan et al. (2008) go a step further and distinguish between five increasing levels of entrepreneurial involvement in the entrepreneurial process, to which they refer as the 'entrepreneurial ladder'.

In this paper we investigate differences in the way women and men take steps on this entrepreneurial ladder. Several studies have indicated that gender influences entrepreneurial behaviour. Not only are women less likely to engage in entrepreneurship, they also appear to have a lower preference for entrepreneurship (vis-à-vis a wage job) than men (Blanchflower et al., 2001; Grilo and Irigoyen, 2006). This clearly indicates that women and men differ in their entrepreneurial involvement at different stages (i.e., preferences and actual involvement) of the process. In fact, most existing studies on the relationship between gender and entrepreneurship take into account only one (or a few) of the following stages in the entrepreneurial process: pre-birth attitudes and preferences, firm start-up (i.e., new venture creation), and success. Gender appears to play a distinctive role in each of these phases (Boden and Nucci, 2000; Minniti et al., 2005; Rosa et al., 1996).

The contribution of this study lies in the fact that we do not focus on one or more *separate* stages in the entrepreneurial process, but rather that we take into account the entrepreneurial process as a whole. We compare women and men regarding the ease with which they move ahead in this process and point at specific factors that slow them down or enhance their entrepreneurial activity. We make use of Flash Eurobarometer data of the European Commission for 2006, consisting of observations for 25 member states of the European Union, Norway, Iceland and the United States.[1] The present study is the first of its kind using this unique data set. We distinguish between different steps in the entrepreneurial process, including "never thought about it"; "thinking about starting up a business"; "taking steps to start a business"; "running a business for less than three years"; and "running a business for more than three years". The study is set up as follows. In Section 2 we describe our model and illustrate how to interpret the results derived from this model. Data are discussed in Section 3. Section 4 presents the results from the analyses. Section 5 concludes.

2. Model

To model the entrepreneurial decision as a process, an ordered logit model will be used (van der Zwan et al., 2008). In this model a latent (continuous) variable, y_i^* ($i = 1, \ldots, n$), is linearly dependent on the explanatory variables as summarized in the $k \times 1$ vector X_i: $y_i^* = X_i'\beta + \varepsilon_i$. The disturbance terms, ε_i, follow a logistic distribution; they are uncorrelated and their variances are fixed at $\pi^2/3$ (with zero means). Note that the coefficient vector β is the same for all observations i and engagement levels j where $j = 1, \ldots, J$ and J is the number of engagement levels.

This latent variable, however, cannot be measured. Instead, the variable Y_i (the engagement level of individual i) is observed. This variable has outcomes y_i, where $y_i = 1, \ldots, J$. Next, $J - 1$ unobserved threshold levels $\alpha_1, \ldots, \alpha_{J-1}$ are introduced which relate y_i^* to y_i.

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[1] For detailed background information on this data set, we refer to the following website of the European Commission: http://europa.eu.int/comm/enterprise/enterprise_policy/survey/eurobarometer_intro.htm.

$$Y_i = \begin{cases} 1 & \text{if } y_i^* \leq \alpha_1; \\ j & \text{if } \alpha_{j-1} < y_i^* \leq \alpha_j, \text{ for } j = 2, \ldots, J-1; \\ J & \text{if } \alpha_{J-1} < y_i^*. \end{cases}$$

Hence, for $j = 2, \ldots, J-1$, the probability of belonging to engagement level j for individual i is given by $\Pr(Y_i = j) = F(\alpha_j - X_i'\beta) - F(\alpha_{j-1} - X_i'\beta)$ with $F(\cdot)$ the cumulative logistic distribution function. For $j = 1$ we have $\Pr(Y_i = 1) = F(\alpha_1 - X_i'\beta)$ and for $j = J$ this probability equals $1 - F(\alpha_{J-1} - X_i'\beta)$. Note that $X = (X_1, \ldots, X_n)$ does not contain a row of ones for identification purposes.[2]

The results obtained by an ordered logit regression are expressed as "log-odds ratios" which are linear functions of the explanatory variables: $\log(\Pr(Y_i \leq j) / \Pr(Y_i > j)) = \alpha_j - X_i'\beta$. For each individual i, and for each engagement level j, it holds that an increase in a particular variable – given that its coefficient is positive and all other variables are held constant – increases the likelihood of moving to a higher engagement level, rather than to stay in the present engagement level.

In the remainder of this study we will make inferences about different variable effects for men and women on the position in the entrepreneurial process. We will make use of interaction terms. Suppose that w_1 denotes gender, w_2 is a specific explanatory variable and $w_1 w_2$ represents the interaction term between these two (and c represents the vector of all other variables). One can then compare the coefficients of men and women by focusing on the sign and significance of β_{12} in the log-odds ratios $\log(\Pr(Y_i \leq j) / \Pr(Y_i > j)) = \alpha_j - (\beta_1 w_1 + \beta_2 w_2 + \beta_{12} w_1 w_2 + c'\beta)$.

3. Data

In the 2006 "Flash Eurobarometer survey on Entrepreneurship" the following question is asked to construct the dependent variable: *"Have you started a business recently or are you taking steps to start one?"*, with the following answer categories: (1) It never came to your mind ("never thought about it"); (2) No, but you are thinking about it ("thinking about it"); (3) Yes, you are currently taking steps to start a new business ("taking steps"); (4) Yes, you have started or have taken over a business in the last three years and are still active ("young business"); and (5) Yes, you started or took over a business more than three years ago and are still active ("mature business")[3].

A description of the explanatory variables is given in Table 1. Also the means and standard errors are presented there. The variables included in the analysis represent important determinants of entrepreneurial behavior as specified in the entrepreneurship literature. Age is found to be important for explaining entrepreneurship in several studies (Delmar and Davidsson, 2000). Education is often included as a determinant of the entrepreneurial decision, with mixed evidence pointing at positive, negative and nonlinear relationships (Evans and Leighton, 1989; Bates, 1995; Burke et al., 2002). Role models and self-employed parents, in particular, appear important in predicting individual entrepreneurial engagement (Dunn and Holtz-Eakin, 2000). Furthermore, we include a proxy for risk tolerance as, traditionally, this is considered an important feature of entrepreneurship (Kihlstrom and Laffont, 1979). Finally, perceptions of the entrepreneurial environment (obstacles) are taken into account. Arenius and Minniti (2005) argue that subjective *perceptions* of the environment tend to be far more important in the start-up decision than the objective *state* of the environment.

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[2] Note that we only consider the homoskedastic analogue of the ordered logit model. Van der Zwan et al. (2008) also estimate a heteroskedastic specification of a similar model, but find no important differences between both specifications.

[3] The question contains two other answer categories: (2a) No, you thought of it or you had already taken steps to start a business but gave up, and (5a) No, you once started a business but currently you are no longer an entrepreneur. The observations of these categories are left out of the analysis because they deviate from a naturally ordered process of entrepreneurial engagement.

Table 1: Explanatory variables

Variable name	Variable description	Mean	St. dev.
Gender	Male(=1) or female (=0).	0.39	0.49
Age	Age of the respondent in years.	45.39	17.22
Education level	Age when finished full time education.	19.61	6.44
Entrepreneurial attitude	To what extent do you (dis)agree with the statement: *My school education helped me to develop my sense of initiative (entrepreneurial attitude)*. Dummy variable with 'strongly agree' or 'agree'=1 and 'disagree' or 'strongly disagree'=0.	0.57	0.50
Self-employed parents	Dummy variable with value 1 if the mother, father or both are self-employed and value 0 if neither of the parents is self-employed.	0.27	0.45
Risk tolerance	To what extent do you (dis)agree with the statement: *One should not start a business if there is a risk it might fail*. Dummy variable with 'strongly disagree' or 'disagree'=1 and 'strongly agree' or 'agree'=0.	0.50	0.50
Perception lack of financial support	To what extent do you (dis)agree with the statement: *It is difficult to start one's own business due to a lack of available financial support*. Dummy variable with 'strongly agree' or 'agree'=1 and 'disagree' or 'strongly disagree'=0.	0.78	0.41
Perception administrative complexities	To what extent do you (dis)agree with the statement: *It is difficult to start one's own business due to the complex administrative procedures*. Dummy variable with 'strongly agree' or 'agree'=1 and 'disagree' or 'strongly disagree'=0.	0.74	0.44
Perception insufficient information	To what extent do you (dis)agree with the statement: *It is difficult to obtain sufficient information on how to start a business*. Dummy variable with 'strongly agree' or 'agree'=1 and 'disagree' or 'strongly disagree'=0.	0.51	0.50
Opinion second chance	To what extent do you (dis)agree with the statement: *People who started their own business and have failed should be given a second chance*. Dummy variable with 'strongly agree' or 'agree'=1 and 'disagree' or 'strongly disagree'=0.	0.86	0.35

The means and standard deviations in this table are computed for the observations that will be used in our analysis in Section 4 (10,037 observations).

In the analyses we control for country-specific effects by including country dummies (25 European Union member states, Norway, and Iceland), with the United States as the benchmark country. Since the focus of the present note is on investigating gender effects, country effects will not be discussed.

4. Results

By running two separate (unrestricted) ordered logit regressions for men and women and comparing them with a 'pooled' (restricted) ordered logit regression[4] we obtain a first impression of the gender differences with respect to the variables' effects.[5] These gender differences may result from

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[4] This 'pooled' regression includes the same explanatory variables as the two unrestricted ones. No gender dummy is included.

[5] This comparison is based on a likelihood ratio test. First, we consider a restricted model in which the coefficients on all variables and the thresholds are equal for men and women. An alternative, unrestricted model would be that different equations apply for men and women. The restricted model is based on all observations and contains all variables, country dummies, thresholds, but no gender dummy. The log-likelihood of the pooled model equals -10,975.06 with 10,037 observations. The log-likelihoods of the models based on 3,965 observations (male) and 6,072 observations (female) are -5,016.95 and -5,712.97, respectively. Considering the likelihood ratio statistic of 244.98 and the 0.01 critical value from the chi-squared distribution with 41 degrees of freedom (10 variables, 27 country dummies, and 4 thresholds) of 64.95 we reject the null hypothesis that the variables, country dummies, and threshold have equal coefficients for men and women (0.05 critical value is 56.94).

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differences in (a) the thresholds, (b) the effect of the country dummies, and/or (c) the effect of the explanatory variables presented in Table 1. It appears that thresholds hardly differ between men and women, whereas for several countries and many variables different effects can be observed. These results offer a first hint of the possible differential impact of various variables on male and female entrepreneurial dynamics and call for a more rigorous investigation since direct comparison of the coefficients in the two regressions is hazardous. As a second exercise, we use a restricted ordered logit regression, including a gender dummy. This exercise shows a significant gender effect (at one percent). This implies that men have a higher probability of moving to a higher entrepreneurial engagement level. Results are presented in Table 2. Note the lack of significance of two perception variables: perception of enough financial support and of sufficient information.[6]

Table 2: Results ordered logit regression, all observations, including gender dummy

Variable	Coefficient	Sign.	St. error
Gender	0.803	***	0.043
Age	0.121	***	0.007
Age squared	-16.314	***	0.849
Education	0.025	***	0.004
Entrepreneurial attitude	0.301	***	0.044
Self-employed parents	0.368	***	0.047
Risk tolerance	0.295	***	0.045
Perc. lack of financial support	-0.039		0.054
Perc. administrative complexities	-0.227	***	0.049
Perc. insufficient information	-0.037		0.045
Opinion second chance	0.130	**	0.064
Threshold 1	2.829	***	0.202
Threshold 2	3.804	***	0.203
Threshold 3	4.280	***	0.205
Threshold 4	4.792	***	0.206
Number of observations	10,037		
Log-likelihood	-10,797.93		
LR statistic	1881.74		
McFadden R^2	0.08		

Country dummies are included in the analysis, but their coefficients are not presented here.
*** denotes significance at 0.01; ** at 0.05.

As a third exercise to test for the significance of difference in the effects for women and men, we include interaction terms for all country effects and variable effects in the ordered restricted logit regression. The four thresholds are held constant across the sexes. Table 3 presents the results including only the *significant* interactions of the countries and the variables with gender. We find significant interaction effects of the following variables with gender: age (squared), self-employed parents, risk tolerance and perception of lack of financial support. It is striking that the independent gender effect disappears (compare Tables 2 and 3) which implies that - while gender plays a role - it does so mainly through the interaction with other variables.

Both age and its squared term have significantly different coefficients for men and women, clearly indicating a distinctive quadratic relationship between age and the likelihood of moving to a higher engagement level. More specifically, the turning points at which the effect of age on moving to a higher engagement level becomes negative amount to 34 for women and 39 years for men.

Note that we do not find a significant interaction effect of gender with education (*p*-value is 0.13), suggesting that, all else equal, the potential of education to push someone up the entrepreneurial ladder is of the same magnitude for both sexes. This result, together with the lack of significance of the gender dummy, also implies that, ceteris paribus and given a specific level of education it as easy for women to move up the entrepreneurial ladder as it is for men.

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[6] This result is also obtained for 2004 data in van der Zwan et al. (2008).

Self-employed parents appear to be important for both women and men in stepping up the entrepreneurial ladder[7]. Nevertheless, it is more important for men than for women. This seems in line with Matthews and Moser (1996) who find that men who have self-employed parents are more likely to be interested in self-employment than women. Note that self-employed parents may also contribute to the success of the entrepreneurial venture by providing financial and/or mental support.

Despite the fact that the perception of lack of financial support does not have a significant effect in the unrestricted regression for women and men (see Table 2), it does matter for explaining differences in entrepreneurial involvement of women and men[8]. In the separate unrestricted regressions, for men the effect of this 'financial' perception is significantly negative (at the 5% significance level), while for women this perception is not important. This suggests that women are less likely than men to let a (possible) lack of financial support get in the way of their entrepreneurial advances. Alternatively, women tend to run smaller firms and are less likely to pursue growth than men (Carter et al., 1997; Rosa et al., 1996; Du Rietz and Henrekson, 2000), explaining their lower capital needs in different phases of the entrepreneurial process.

The negative interaction effect of gender with risk tolerance indicates that, although it is important for both women and men, risk tolerance plays a more important role for women in the entrepreneurial process. This suggests that risk aversion is a gender-specific barrier to advance in the entrepreneurial world. Indeed, it has been argued that women have a lower propensity to take risk (Sexton and Bowman-Upton, 1990) and a higher fear of failure (Minniti et al., 2005) than men. Investigating the binary logistic regressions for the separate steps in the entrepreneurial process (from "never thought about it" to "thinking about it"; from "taking steps" to "young business", etc.) we see that risk tolerance remains (more) important (for women) throughout the entrepreneurial process[9].

From the separate unrestricted ordered logit regressions for women and men we find that the opinion that entrepreneurs deserve a second chance is only relevant for explaining the entrepreneurial engagement of *women*, although the interaction term is not significant in the 'pooled' ordered regression (Table 3). This finding suggests that – for women – the need to feel secure, i.e., that they are given a second chance in case of failure, is important in determining the position in the entrepreneurial ladder. This may be related to the fact that women are more risk averse and are more likely to fear failure than men (Minniti et al., 2005).

Finally, concerning the influence of the country where one lives and works, the last five interaction effects in Table 3 indicate that in Ireland and in some Mediterranean countries such as Greece, Italy, Cyprus and Portugal, for men it is easier to climb the entrepreneurial ladder as compared to the US[10].

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[7] Separate ordered logit regressions show a significant positive effect of self-employed parents for both women and men.

[8] Note that the perception questions, such as the perception of a lack of financial support, and the second chance opinion question can be interpreted by the respondents in (at least) two different ways: (1) they may think of their own situation; or (2) they may think of the general environment for or attitude towards entrepreneurship in their country, region, city, etc.

[9] Using binary logit regressions we investigate determinants of these separate steps in the entrepreneurial process. For example, the first engagement level ("never thought about it") can be compared with the four remaining engagement levels ($\Pr(Y_i=1)$ versus $\Pr(Y_i>1)$). Similarly, three other logit regressions can be conducted: $\Pr(Y_i\leq2)$ versus $\Pr(Y_i>2)$, $\Pr(Y_i\leq3)$ versus $\Pr(Y_i>3)$ and $\Pr(Y_i\leq4)$ versus $\Pr(Y_i=5)$. See also van der Zwan (2008).

[10] Recall that the US is used as the base in this regression. Lack of significance in the other country-gender interaction effects suggest that the gender effect in the countries mentioned is also stronger than in all other remaining ones.

Table 3: Results ordered logit regression, incl. relevant interactions

Variable	Coefficient	Sign.	St. error
Gender	0.125		0.324
Age	0.101	***	0.010
Age squared	-14.622	***	1.183
Education	0.029	***	0.005
Entrepreneurial attitude	0.287	***	0.044
Self-employed parents	0.289	***	0.065
Risk tolerance	0.423	***	0.059
Perc. lack of financial support	0.080		0.075
Perc. administrative complexities	-0.222	***	0.050
Perc. insufficient information	-0.041		0.045
Opinion second chance	0.135	**	0.064
Gender*Age	0.044	***	0.014
Gender*Age squared	-3.817	**	1.674
Gender*Self-employed parents	0.185	**	0.094
Gender*Risk tolerance	-0.302	***	0.087
Gender*Perc. lack of financial support	-0.246	**	0.103
Gender*Greece	0.397	**	0.167
Gender*Ireland	0.494	**	0.251
Gender*Italy	0.689	***	0.216
Gender*Cyprus	0.495	**	0.227
Gender*Portugal	0.608	***	0.224
Threshold 1	2.477	***	0.257
Threshold 2	3.457	***	0.258
Threshold 3	3.937	***	0.259
Threshold 4	4.453	***	0.260
Number of observations	10,037		
Log-likelihood	-10,757.83		
LR statistic	1,961.95		
McFadden R^2	0.08		

Country dummies are included in the analysis, but their coefficients are not presented here.
*** denotes significance at 0.01; ** at 0.05.

5. Conclusion

Using an ordered logit model to investigate the steps in the entrepreneurial process and using about ten thousand observations from the 2006 "Flash Eurobarometer survey on Entrepreneurship", we zoom in on differences between women and men. Starting from the finding that women have a lower probability of progressing in the entrepreneurial process, we examine the factors that may slow them down or, alternatively, that may disproportionally enhance the entrepreneurial activity of men. We find that risk tolerance is more important for women than for men, suggesting that fear of failure is a gender-specific barrier that withholds women from committing themselves in the entrepreneurial process more fully. On the other hand, lack of financial support seems to be less influential in holding back entrepreneurial energy for women than for men. The U-shaped influence of age, which is established for both men and women, implies that after a certain age, growing older will make it more difficult to climb the entrepreneurial ladder. The positive effects of education, entrepreneurial attitudes and self-employed parents, irrespective of gender, are well-known results in the world of explaining the entrepreneurial decision as a binary choice. The results here further support these insights by extending them in the context of a set of stages that forms the entrepreneurial process. Finally, the existence of significant interaction effects between gender and some country dummies points to the need for further investigation of country-specific characteristics which may play a role in explaining gender differences. Factors such as sectoral composition of economic activity, labour law, social security characteristics including child care facilities, tax treatment of double income, may be behind the differential in the entrepreneurial

gender imbalance across countries. Clearly, more research and more specific information are needed in order to investigate the influence of these country specific factors.

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