H200622

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Zoetermeer, December, 2006

SCALES
SCientific AnaLysis of Entrepreneurship and SMEs

This report is published under the SCALES-initiative (SCientific AnaLysis of Entrepreneurship and SMEs), as part of the 'SMEs and Entrepreneurship programme' financed by the Netherlands Ministry of Economic Affairs.

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Determinants of self-employment preference and realization of women and men in Europe and the United States

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Abstract: Female self-employment rates are consistently lower than those of men. This untapped female potential has drawn the attention of policy makers. In the present paper the determinants of self-employment rates of both men and women are investigated in the context of a two-equation model explaining both actual self-employment and the preference for self-employment. A systematic distinction is made between different ways in which gender can exert influence on (preference for) self-employment, including moderation, mediation and direct effects. Using Flash Eurobarometer data of about 8,000 individuals from 29 countries (including the 15 old EU member states, 10 new EU member states and the United States) probit equations are estimated explaining the (preference for) self-employment. Next to gender, explanatory variables include age, education, social capital, risk attitude, locus of control and perceptions of the entrepreneurial environment. Findings show that at least part of the explanation of the lower female self-employment rate is caused by a lower preference for women to become self-employed. We do not find evidence for a moderating effect of gender on the relationship between self-employment and the preference for self-employment, indicating that – other things equal – women and men who have a preference to become self-employed do not differ with respect to the impact of this preference on its materialization.

Version: December 2006

Document: VerheulThurikGrilo gender and determinants 18 11/30/2006 4:58:00 PM

JEL-code: J16, J22, J23, L26, M13

Keywords: determinants of entrepreneurship, gender, latent and nascent entrepreneurship, Europe

Acknowledgement: the authors would like to thank Reena Bhola, Martin Carree, Felix Fitzroy, Philipp Köllinger, Iñaki Peña, Gavin Reid, Enrico Santarelli, André van Stel and Peter van der Zwan for their useful comments and assistance. Ingrid Verheul acknowledges financing by the Researcher Exchange and Mobility (REM) Programme 2004-2005 of the Gate2Growth Academic Network in Entrepreneurship, Innovation and Finance which allowed her to visit the Max Planck Institute of Economics in Jena, the Centre for Research into Industry, Enterprise, Finance and the Firm (CRIEFF) at the University of St-Andrews, Instituto Superior Tecnico of the Technical University in Lisbon, the department of Business Economics at the Universidad Autonoma de Barcelona and the Department of Economics of the University of Bologna. Some of the work of the first two authors has been done within the framework of the research program SCALES carried out by EIM and financed by the Dutch Ministry of Economic Affairs.

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1. Introduction

The important role of entrepreneurship for economic development has persuaded policy makers to search for ways to improve the entrepreneurial climate.[1] This can be done through enabling new groups of people to have a go at starting a firm (European Commission, 2002). One of these new groups is women. Worldwide there are more male than female entrepreneurs, i.e., women are less likely to engage in entrepreneurial activity than men, whether measured in terms of newly founded firms or established businesses (Minniti et al., 2005; Reynolds et al., 2002; Verheul, 2005)[2]. Even when controlling for other determinants such as education, work experience and wealth, women are less likely to enter self-employment (Bates, 1995). Because the share of women in entrepreneurship is still below 50 percent, women can be considered a potential and untapped resource in terms of participation in entrepreneurial activity.

Not only are women less likely to be involved in entrepreneurship, they also have a lower preference to become an entrepreneur (Blanchflower et al., 2001; Grilo and Irigoyen, 2006; Grilo and Thurik, 2005a, 2006; Minniti et al., 2005; Reynolds et al., 2002; Reynolds, 1997). Because the willingness to become an entrepreneur is an important determinant of entrepreneurship (Grilo and Irigoyen, 2006; Blanchflower et al., 2001; Van Praag and Van Ophem, 1995) the lower preference of becoming an entrepreneur of women may – at least partially – explain their lower entrepreneurial activity rates.

Entrepreneurship is a multi-layered process where people go through different stages of starting up and running a business. Each stage is influenced in a different way or by different factors (Davidsson and Honig, 2003; Grilo and Thurik, 2005b and 2005c; Van der Zwan, Thurik and Grilo, 2006). According to Davidsson and Honig (2003) the discovery and exploitation phase of entrepreneurship are influenced by different factors. Next to the determinants of entrepreneurial activity it is important to understand the antecedents of the willingness of an individual to engage in this activity. In the present study a distinction is made between the *preference* for and engagement in entrepreneurial *activity*. This enables us to investigate the link between the preference for entrepreneurship and entrepreneurial activity (i.e., how preferences influence actual behavior) as well as their 'separate' determinants. To explain the lower entrepreneurship rates of women as well as their lower preference to engage in entrepreneurial activity we investigate how gender influences preferences, entrepreneurial activity and the relationship between these two entrepreneurial stages.

Policy makers need to understand the discrepancy between female and male entrepreneurial activity rates. Is the lower activity rate of women mainly explained by their lower preference or do other factors (e.g., related to the ability to become self-employed) play a role, and in what way? Next to the willingness (motivation) of an individual to start a business, the opportunity (ability or resources) also influences the occupational choice (Van Praag and Van Ophem, 1995). Indeed, there may be gender-based obstacles discouraging women to become actively involved in entrepreneurship (Riding and Swift, 1990; Moore and Buttner, 1997; Fischer et al., 1993; Fay and Williams, 1993; Buttner and Rosen, 1988). The existence of obstacles does not imply that entry into self-employment does not take place. As Gatewood et al. (1995, p. 373) argue "*... some individuals are more likely to start a business, no matter what difficulties they encounter. ...potential entrepreneurs with the will ... to get into business will find a way to achieve this objective*".

[1] See Carree and Thurik (2003) who provide an overview of studies that have investigated the relationship between entrepreneurship and economic growth.

[2] Minniti et al. (2005) and Reynolds et al. (2002) use data of the Global Entrepreneurship Monitor (GEM). GEM measures the TEA rate made up of nascent entrepreneurs (i.e., people actively involved in starting up a business) and entrepreneurs of young firms (i.e., firms operated for less than 42 months). Verheul (2005) refers to female self-employment rates as published in the OECD Labor Force Surveys.

Existing studies on the role of gender in different entrepreneurial stages indicate that gender influences both the preference for and actual engagement in entrepreneurial activity (Minniti et al., 2005; Reynolds et al., 2002; Reynolds, 1997; Blanchflower et al., 2001; Grilo and Irigoyen, 2006; Grilo and Thurik, 2006). This means that there is need for a detailed investigation of the drivers of these gender differentials (Grilo and Thurik, 2005a). Merely including a gender dummy in the analysis (as is done in most studies investigating gender effects) does not provide this information. Although some studies distinguish between mediation and moderation effects of gender (Collins-Dodd et al., 2004), few make a systematic distinction between different effects. For example, studies by Blanchflower et al. (2001); Burke et al. (2002); Delmar and Davidsson (2000) and Arenius and Minniti (2005) investigate moderation (i.e., interaction) effects but do not take into account mediation effects. Moreover, except for the study by Blanchflower et al. (2001), these studies do not take into account preferences as well as actual self-employment.

In this study we distinguish between different ways in which gender influences (the relationship between) preference for self-employment and active involvement, including mediation, moderation and 'direct' effects (Baron and Kenny, 1986; James and Brett, 1984; Verheul, 2005). A *mediation* effect occurs when the relationship between the antecedent and the consequence disappears when mediating variables are included in the model. For example, when gender differences in socio-demographic characteristics, such as education, largely explain the observed gender gap in self-employment; or when gender differences in preferences are the main reason behind differences in self-employment. A *moderation* (or interaction) effect occurs when the relationship between – for example – education and self-employment is dependent upon the gender of the entrepreneur, i.e., the influence of education on self-employment is different for women and men. We refer to a *direct* effect when gender still has an effect on self-employment after controlling for relevant variables such as socio-demographic characteristics[3].

To explain the preference for and active involvement in entrepreneurship the present study uses an equation-by-equation probit model as proposed by Grilo and Irigoyen (2006): it estimates the probability of revealing a preference for self-employment and actual self-employment. Preference for self-employment is included as an explanatory variable of actual self-employment status.[4] The model is tested using Flash Eurobarometer survey data including observations from the 15 old EU member states, the 10 new EU members and the United States for 2004. A sample of 7914 female and male entrepreneurs is used to establish the gender effects.

The set-up of the paper is as follows. First, we discuss the factors influencing the preference for and actual self-employment. Because the occupational choice is in essence an individual decision (Van Praag and Van Ophem, 1995; Verheul et al., 2002), the present paper focuses on individual-level determinants. We will also discuss gender differences with respect to these determinants. Do we expect that the impact of a variable on self-employment is different for men and women (in line with the moderation effect) or that an explanatory variable has a different (mean) value for women and men (in line with the mediation effect)? Subsequently, we introduce our model explaining the preference for and actual involvement in self-employment, and discuss how gender effects are tested for within the context of this model. Sample characteristics, variables and results of the empirical analyses are presented and discussed. We will end with a conclusion and some policy recommendations.

[3] The direct effect may be seen as a residual effect, since its existence is dependent upon missing variables (related to both gender and entrepreneurship), i.e., the direct effect is a combination of a "pure" gender effect and misspecification of the model due to missing moderation and mediation variables.

[4] A similar model is used by Van Stel, Storey and Thurik (2007) where the relationship between regulation and entrepreneurship is investigated using averaged GEM data of 39 countries.

2. Determinants of Self-Employment

In the literature on (the determinants of) entrepreneurship a distinction can be made between theory, empirical literature and comprehensive frameworks (Grilo and Thurik, 2005a). From a theoretical perspective the literature on entrepreneurship spans various disciplines, including economics, sociology, psychology, management, political science and geography (Audretsch et al., 2002). Each of these fields has a different view on what entrepreneurship is, how it is measured, its role in society and where it comes from. In the framework approach these different disciplines are combined to explain entrepreneurship as a multi-facetted phenomenon. The present study is largely empirical in nature and draws upon the relevant literature for theoretical foundation.

Preferences for self-employment, which may be considered a measure of latent entrepreneurship, have been far less analyzed than actual entrepreneurship (Blanchflower et al., 2001). Although the concept of latent entrepreneurship differs from that of nascent entrepreneurship (where the latter is more advanced as actual steps are undertaken with respect to starting a business rather than just preferring it) we will also pay attention to the nascent entrepreneurship literature (Grilo and Thurik, 2005c).

There is a large set of variables that have been found to influence the self-employment decision. This study focuses upon individual-level determinants of (preference for) self-employment. Insight in the individual determinants of the willingness and opportunity to become self-employed is important to identify would-be entrepreneurs who can be targeted through government programs (Van Praag and Van Ophem, 1995). Verheul et al. (2002) argue that essentially the entrepreneurial decision is made at the individual level, taking into account entrepreneurial opportunities and resources, ability, personality traits and preferences of the individual.

We discuss the following determinants of (preference for) self-employment: demographics, including age and gender[5]; human capital (education); social capital (self-employed parents); personality factors, including risk attitude and locus of control; and individual perceptions of the environment, including the perception of financial support, the perception of administrative complexity, the perception of the availability of information and the perception of the economic climate. Following Arenius and Minniti (2005) we argue that perceptional variables are important in determining self-employment. Subjective individual perceptions of the environment may be more likely to influence the start-up decision than the actual (objective) 'status' of the environment. Although this list of determinants is by no means exhaustive (we anticipate upon using the Eurobarometer data set), it includes some of the main factors influencing the individual decision to become self-employed.

Demographic variables: age

Many business owners are between 25 and 45 years old (Storey, 1994; Reynolds et al., 1999). Business ownership peaks as people approach the age of 40 and then levels out (Bates, 1995). Nascent entrepreneurship rates also tend to be relatively high for people within the age category of 25 to 34 years old (Van Gelderen, 1999; Delmar and Davidsson, 2000). Lévesque and Minniti (2006) argue that when individuals are older, wage-employment becomes more attractive as compared to self-employment. Female entrepreneurs may have a different age profile than male entrepreneurs, in particular since women tend to (partly or completely) withdraw from employment after marriage. According to Charles et al. (2001) marriage and the presence of children (e.g., infants, toddlers and school-age children) negatively affect the probability of

[5] The effect of gender is discussed per determinant rather than separately since the aim of this study is to find out how gender influences the (relationship between) explanatory factors and self-employment (preference).

employment for women. Matthews and Moser (1996) find that women are likely to be older than men when they start a business for the first time. This may be indication that women and men of the same age differ with respect to the preference for and the participation in self-employment. However, Arenius and Minniti (2005) do not find evidence for an interaction effect of age and gender on nascent entrepreneurship.

Human capital: education level

Human capital includes general and specific knowledge (Becker, 1993; Castanias and Helfat, 1991; 2001). General knowledge is acquired through education, whereas specific knowledge refers to, for example, entrepreneurial and industry experience. Individuals with higher levels of human capital are argued to be better at perceiving entrepreneurial opportunities and, accordingly, are more likely to engage in entrepreneurial activity (Davidsson and Honig, 2003). From a more general perspective, Frederick (2005) argues that cognitive abilities play a role in occupational decision-making. According to Frederick (2005, p. 26): "… the relationship is sometimes so strong that the preferences themselves effectively function as expressions of cognitive ability".

Evidence on the relationship between education level and self-employment is mixed. Several studies show a positive effect on self-employment (Robinson and Sexton, 1994; Bates, 1995), whereas macro-level studies by Uhlaner and Thurik (2007) and De Wit and Van Winden (1989) find a negative effect. Blanchflower (2004) finds that education is positively correlated with self-employment in the United States, but negatively in Europe. Grilo and Thurik (2005a) show that this relationship is negative up to the level of 'intermediate' education and does not exist for higher levels of education. Other studies find evidence for a nonlinear relationship with the probability of becoming or being an entrepreneur (Evans and Leighton, 1989; Reynolds, 1997; Grilo and Irigoyen, 2006). For early-stage entrepreneurial activity (i.e., preference for self-employment and nascent entrepreneurship) positive effects of education level on entrepreneurship have been reported (Blanchflower et al., 2001; Grilo and Irigoyen, 2006; Davidsson and Honig, 2003; Delmar and Davidsson, 2000; Arenius and Minniti, 2005). Davidsson and Honig (2003) find that while education increases the probability of becoming a nascent entrepreneur, in later stages specific human capital is more important.

Women and men do not tend to differ with respect to their education level, but women and men with the same level of education may differ with respect to the decision to become self-employed, i.e., there may be moderation effects. Bates (1995) finds that relative to men, women appear to rely more heavily upon advanced education in their decision to become self-employed[6]. Indeed, employment and start-up rates are higher for women with post-secondary education than for women with lower education (OECD, 2002; Minniti et al., 2005; Schetkatt and Yocarini, 2001). However, Burke et al. (2002) find that post-compulsory education has a negative effect on the probability of male self-employment, and no effect on female self-employment.

Social capital: parental role models

Role models from the family or workplace are important for entry into self-employment (Brockhaus and Horwitz, 1986). Davidsson and Honig (2003) argue that 'bonding social capital' based upon strong ties, such as having parents who own(ed) businesses and support from family and friends, is a good predictor for entry into self-employment. Indeed, parental role models is found to be an important predictor of self-employment (Cooper, 1986; Dunn and Holtz-Eakin, 2000; Hout and Rosen, 2000; Krueger, 1993; Matthews and Moser, 1996; Sanders and Nee, 1996; Scherer et al., 1989; Shapero and Sokol, 1982; Timmons, 1986). Dunn and Holtz-Eakin

[6] Bates (1995) relates this strong effect of education on female self-employment to sector choice, where education level appears to be particularly important in skilled services, a sector where women tend to be concentrated.

(2000) argue that the positive influence of family background is related to the availability of family financial capital and relevant human capital. Having entrepreneurial parents may be more important for the *interest* in self-employment than for later stages in the entrepreneurial process, where support from outside the family becomes more important (Davidsson and Honig, 2003; Matthews and Moser, 1996).

Several studies find that self-employed women are likely to have a *self-employed parent* (Brush, 1992; Waddell, 1983). Investigating whether men and women are equally influenced by role models Matthews and Moser (1996) find that men with a family background in small business expressed a higher interest in small business ownership than women with such a background. Similarly, Hout and Rosen (2000) find that for both women and men self-employment depends upon whether the father was self-employed, but that for women this relationship is less strong.

Personality characteristics: risk attitude and locus of control

Brockhaus (1982) identified three personality characteristics important for displaying entrepreneurial behavior, including need for achievement, internal locus of control and risk-taking propensity. The latter two are investigated in this study. In the literature entrepreneurship has often been associated with risk-taking (Knight, 1921; Cantillon, 1931; Hull et al., 1980; Kihlstrom and Laffont, 1979; MacGrath et al., 1992; Sexton and Bowman, 1985, 1986; Stewart et al., 1999; Begley, 1995; Stewart and Roth, 2001)[7]. Several studies find that the probability of self-employment increases with risk tolerance (Grilo and Irigoyen, 2006; Parker, 1996; Arenius and Minniti, 2005). On the other hand, Parker (2004, p. 83/4) argues that the empirical relationship between risk adversity and entrepreneurship is ambiguous. Shane and Venkataraman (2000) note that risk tolerance may be more influential in the exploitation phases of entrepreneurship than in earlier (decision) phases.

The concept of locus of control was first proposed by Rotter (1966). Locus of control can be seen as a continuum where an individual believes that (s)he can influence events through ability or effort (i.e., internal locus of control), or that external forces (i.e., the environment) determine outcomes (i.e., external locus of control). Gatewood et al. (1995) find evidence for a relationship between internal attribution and entrepreneurial activity. In general, entrepreneurs have been found to be characterized by an internal rather than an external locus of control (Brockhaus and Horwitz, 1986; Beugelsdijk and Noorderhaven, 2005; Perry et al., 1986).

Women tend to be characterized by a lower propensity to take risk than men (Sexton and Bowman-Upton, 1990; Masters and Meier, 1988; Verheul and Thurik, 2001) which is likely to have consequences for their interest in and their decision to become self-employed. Indeed, Minniti et al. (2005) find a negative relationship between fear of failure and women's entry into self-employment. As compared to men, women also tend to have a more external locus of control as they often do not take credit for success, attributing their success to external sources or luck rather than to their own effort or ability (Rosenthal et al., 1996; Parsons et al., 1982; LaNoue and Curtis, 1985). However, comparing women and men who have started a business, Gatewood et al. (1995) find that women are characterized by higher internal attributions and men by higher external attributions. This finding suggests that women undertake entrepreneurial activity only when they have the willingness and ability to be successful and stop when they feel that they lack these characteristics. Hansemark (2003) finds that whereas locus of control has predictive power for men, it does not explain start-up activity of women.

[7] Other research has argued that risk-taking is not a distinctive feature of entrepreneurship (Brockhaus and Nord, 1979; Brockhaus, 1980; Brockhaus and Horwitz, 1986).

(Perceptions of the) environment for entrepreneurship

In addition to individual characteristics, the environment for entrepreneurship will also play a role in determining an individual's (preference for) self-employment. This study focuses upon the perception of four environmental factors: (i) *administrative complexities* that consume time and money and may discourage people to start a business (World Bank, 2005; OECD, 1998)[8]; (ii) *access to information* (e.g., through one-stop shops or information meetings at the Chamber(s) of Commerce) which familiarizes (potential) entrepreneurs with the activities involved in new venture creation and enables them to efficiently start or run a business; (iii) *access to finance*, often identified as an important entry barrier for self-employment (Evans and Jovanovic, 1989; Bates, 1995) in particular since investors may be reluctant to invest in small and new firms because of the absence of a track record, the high risk and the fixed cost element of transactions (Berger and Udell, 1998; Chittenden et al., 1996; Cressy, 2006); and (iv) the *general economic climate*, determining the opportunities available for entrepreneurial activity as well as the risks and rewards of setting up shop (Verheul et al., 2002)[9].

Because the decision to become self-employed is made at the individual level, it is likely that the perception of the environment rather than the environment itself is a predictor of the self-employment decision (Arenius and Minniti, 2005). Van Stel and Stunnenberg (2006) argue that it is this perceived information that is actually used in the decision making of potential entrepreneurs, irrespective of whether the information is correct. The present study incorporates perceptions of the entrepreneurial environment rather than objective measures of this environment.

Arenius and Minniti (2005) find that the relationship between the likelihood of becoming an entrepreneur and *perceptional variables* is not dependent upon gender[10]. However, if women (think that they will) experience more problems with the acquisition of financial capital, for example, because of (perceived) gender-based discrimination by lenders and financial institutions, this may influence their perception of available financial support. Several studies suggest that acquiring capital is more difficult for women than for men (Hisrich and Brush, 1986; Brush, 1992; Carter and Cannon, 1992; Carter, 2000), whereas others do not find evidence for gender differences (Buttner and Rosen, 1989; Riding and Swift, 1990). Also, women tend to have less experience with starting and running a business than men (Fischer et al., 1993; Kalleberg and Leicht, 1991), which may have consequences for their perception of the magnitude of administrative complexities and available information on starting up and running a firm.

3. Model

In this section we present the model used to explain the preference for and actual involvement in entrepreneurial activity. The basis for this model is the occupational choice between wage-employment and self-employment. We use an equation-by-equation probit estimation[11]. We estimated probit equations for the probability of revealing a preference for self-employment and

[8] Coping with administrative regulations has been cited as the third most important constraint in the former EU-19 countries (KPMG/ENSR, 2002). For a discussion of different type of administrative costs, see World Bank (2005).

[9] Several studies have linked the level of unemployment (as an indicator of the general economic climate) to self-employment (Audretsch et al., 2005; Carree (2002); Storey, 1991).

[10] Arenius and Minniti (2005) investigate the following perception variables: perception of one's own skills, likelihood of failure; existence of opportunities; and knowledge of other entrepreneurs.

[11] Given the recursive nature of the model the procedure provides consistent estimators provided that the error terms are not correlated across equations. We find that this is true. ρ equals 0.007 with a standard error of 0.355. The likelihood ratio test statistic equals 0.0004 and is χ_1^2 distributed. The corresponding p-value equals to 0.984 and the null hypothesis of ρ=0 can be rejected. Accordingly, it is justified to estimate the two equations separately

for actually being self-employed (Grilo and Irigoyen, 2006). More precisely, these equations can be formulated as follows[12]:

(1) $Pr\,(y_1=1 \mid X) = F\,(Xb_1)$,

where $y_1 = 1$ if the individual has a preference for self-employment and $y_1 = 0$ if the individual prefers wage-employment.

(2) $Pr\,(y_2=1 \mid X, y_1) = F\,(Xb_2+y_1a)$,

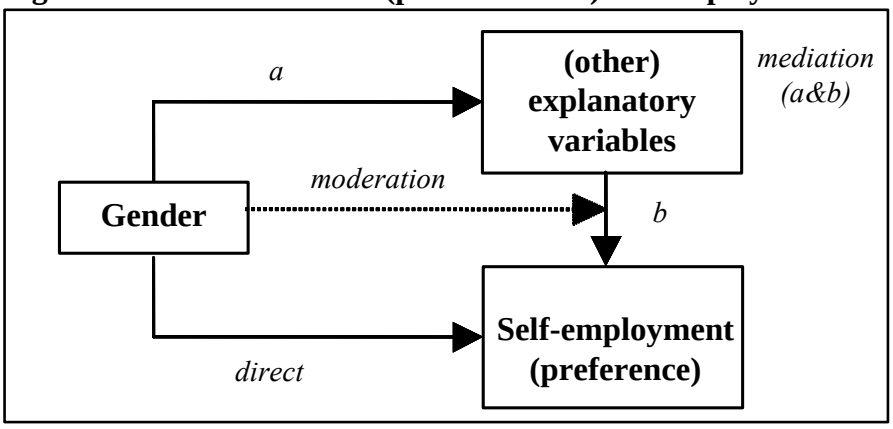
where $y_2 = 1$ if the individual is self-employed and $y_2 = 0$ if the individual is wage-employed. Note that actual self-employment status (y_2) is made dependent on preference for self-employment (y_1).

For both equations: X = (1, men, age, (age/100) squared, low education, high education, self-employed parents, the existence of administrative complexities, difficulty obtaining sufficient information, unfavorable economic climate, risk tolerance, internal locus of control, country dummies). A detailed description of the independent variables is given in Table 1.

We have seen that (on average) women tend to have a lower preference for self-employment and are less likely to be self-employed. This gender difference in entrepreneurship preference and status may be related to a gender difference in the values for X (see Equation 1 and 2) – including preference for self-employment in Equation 2 – or to differences with respect to the coefficients of the effects of X (a, b_1 and b_2), which would imply that the effects of the explanatory variables are different across gender. This refers to a *mediation* and *moderation* effect, respectively. We estimate Equation (1) and (2) including interaction effects of gender with the (other) explanatory variables to find out whether the influence of the explanatory variables works out differently for women and men. In addition, coefficients for the indirect (i.e., mediation) effects are calculated and tested for significance.

To summarize, Figure 1 graphically presents the different ways in which gender can influence the preference for and actual involvement in self-employment. Given this model a gender difference in (preference for) self-employment can be due to different effects, including an *indirect* (or *mediated*) effect – through gender differences with respect to other explanatory variables – on (preference for) self-employment; a *direct* effect, which is the effect of gender that remains after controlling for the effects of other explanatory variables; and a *moderation* effect, where gender influences the relationship between the explanatory variables and self-employment.

Figure 1: Gender effects on (preference for) self-employment



[12] We find that there is no heteroskedasticity problem. For the probit equations the LM statistic amounts to 18.788 and 17.213, respectively, with the critical value equal to 22.362 (13 degrees of freedom and 5% significance level).

3. Method

Data sample

We use data from the Flash Eurobarometer survey for 2004.[13] This survey was conducted on behalf of the Directorate-General "Enterprise" of the European Commission for a random sample of the general population from 29 countries, including the 15 old EU member states, the ten new EU member states, The United States, Iceland, Liechtenstein and Norway. Each national sample is representative of the population according to age class. Data was collected by 29 EOS Gallup Europe institutes. In April 2004 a total number of 21051 people were interviewed by telephone for this survey, amongst who are 18547 citizens from the European Union (25 EU countries) and 1003 Americans. The sample sizes amount to approximately 500 or 1000 respondents in each country. For the EU countries a weighing factor has been applied in order to compute a marginal total where each country contributes to the EU result in proportion of its population.

For this study we used data from 25 countries, including the EU countries and the United States. The total number of observations for this study amounts to 7914 of which 4356 and 3558 refer to male and female respondents, respectively. We have used only respondents active in the labor market (we removed students, unemployed, retired, etc.) and who answered all questions in the survey, i.e., observations with no answer to one of the questions in this survey were left out. The number of observations for the different countries in the data set varies from 146 and 149 for Malta and Slovenia to 490 and 501 for Germany and the United States, respectively. The minimum number of observations for women is 51 (for Malta) and the maximum is 244 (for Germany). The minimum number of male observations is 78 (for Estonia) and the maximum is 280 (for the United States).

Variable description

Two indicators of entrepreneurship are used. First, self-employment preference is measured using the following question: '*Suppose you could choose between different kinds of jobs, which one would you prefer: being an employee or being self-employed*?'. A drawback of this measure is that an individual may think of self-employment as interesting (because of favorable attributes such as being your own boss, flexible working hours) without actually engaging in entrepreneurial activity. Hence, this question may be more likely to measure a general opinion rather than a preference that leads to concrete action (Blanchflower et al., 2001; Grilo and Irigoyen, 2006; Grilo and Thurik, 2005a)[14]. Second, as a measure of actual entrepreneurship we have used observations for the respondents who answered '*self-employed*' to the following question: '*As far as your current occupation is concerned, would you say that you are self-employed, an employee, a manual worker or would you say that you are without a professional activity?*'.

Table 1 gives a description of the explanatory variables used in the analysis to explain (preference for) self-employment. Note that the preference for self-employment is also used as an explanatory variable for actual self-employment (see Equation 1).

[13] The key findings are presented in Flash Eurobarometer 160 'Entrepreneurship', European Commission 2004, available at the following website: http://europe.eu.int/comm/public_opinion/flash/fl160_en.pdf

[14] As this question is answered by individuals who are already self-employed or wage-employed, this measure refers to the preference to *be* self-employed and to *become* self-employed.

Table 1: Description of explanatory variables

Name of variable	Description of variable
Gender	Is the respondent male or female? (male=1)
Age	Age of the respondent in years
Age/100 squared	[Age divided by 100] squared
Low education	Dummy variable with value 1 if age when finished full time education < 15 or if respondent never engaged in full time education and 0 otherwise.
High education	Dummy variable with value 1 if age when finished full time education > 21 and 0 otherwise.
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.
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.
Perception administrative complexity	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.
Perception sufficient info	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.
Perception economic climate	To what extent do you (dis)agree with the statement: *The current economic climate is not favorable for people who want to start their own business*. Dummy variable with 'strongly agree' or 'agree'=1 and 'disagree' or 'strongly disagree'=0.
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.
Internal locus of control	When one runs a business, what do you think is most likely to determine its success? Max. of two answers. Answer categories: (a) director's personality; (b) general management of the business; (c) overall economy; (d) political context; (e) outside entities. (a) and (b) = internal factors. (c), (d) and (e) = external factors. This variable has value -1 if only external factors are chosen; value 1 if only internal factors are chosen; value 0 in all other cases.

Descriptive statistics

We find that *on average* women are less likely to show a preference for self-employment (versus wage-employment) and are also less likely to be self-employed. Table 2 shows that 41 percent of the women in the sample have a preference for self-employment against 56 percent of the men. For actual self-employment these percentages amount to 14 and 25 percent for women and men, respectively.

Table 2: Gender differences in preference for self-employment and actual self-employment

	Male (std. error)	**Female (st. error)**	**Chi-square (P-value)**
Self-employment preference	0.560 (0.008)	0.411 (0.008)	173.73** (0.000)
Actual self-employment	0.245 (0.007)	0.144 (0.006)	126.99** (0.000)

Table 3 presents Pearson correlations between the main variables in this study, their means and standard deviations. Similar to the findings in Table 2 we see that gender correlates with both preferences and actual self-employment. Gender also correlates with age, high education, risk tolerance, and the perception variables for lack of financial support, administrative complexities, and general economic climate. Although the correlation coefficients are relatively low, they do give reason to believe that it is worthwhile to further explore gender differences.

Table 3: Correlations among dependent and independent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	1													
2. Self-employment preference	0.148**	1												
3. Actual self-employment	0.127**	0.301**	1											
4. Age	0.042**	-0.024*	0.153**	1										
5. Age/100 squared	0.049**	-0.014	0.157**	0.986**	1									
6. Low education	0.016	0.017	0.069**	0.185**	0.196**	1								
7. High education	-0.024*	0.001	-0.012	0.003	-0.004	-0.279**	1							
8. Self-employed parents	0.019	0.099**	0.181**	0.030**	0.040**	0.050**	0.060**	1						
9. Perc. Lack financial support	-0.054**	0.026*	-0.009	-0.024*	-0.020	0.053**	0.084**	-0.007	1					
10. Perc. admin. complexity	-0.026*	-0.046**	0.057**	0.042**	0.043**	0.054**	0.070**	-0.017	0.202**	1				
11. Perc. insufficient info	-0.001	0.016	0.022*	0.032**	0.034**	0.102**	0.073**	0.009	0.215**	0.270**	1			
12. Perc. unfav. econ. climate	-0.041**	-0.055**	-0.013	-0.014	-0.014	0.069**	0.100**	-0.008	0.264	0.171**	0.179**	1		
13. Risk tolerance	0.032**	0.117**	0.047**	-0.083**	-0.08**	-0.081**	0.169**	0.065**	-0.136**	-0.139**	-0.151**	0.183**	1	
14. Internal locus of control	0.008	0.07**	0.025*	-0.012	-0.008	0.014	0.069*	0.047**	-0.084**	0.049**	0.041**	0.129**	0.142**	1
Mean	0.550	0.493	0.200	40.502	0.178	0.118	0.367	0.272	0.761	0.707	0.448	0.685	0.496	0.778
Std. Error	0.497	0.500	0.400	11.647	0.100	0.323	0.482	0.445	0.426	0.455	0.497	0.464	0.500	0.415

*Correlation is significant at the 5% level (two-tailed); ** Correlation is significant at the 1% level (two-tailed).

4. Analysis and Results

We have seen that women in the sample are less likely to show a preference for self-employment and are less likely to be self-employed. This gender difference may be attributed to the fact that women and men differ with respect to the individual-level factors influencing self-employment preference and status, or that the influence of the explanatory factors is different for women and men. In this section we investigate the origin gender differences in (preference for) self-employment presented in Table 2.

Gender as dummy variable

Table 4 presents the results of the probit analyses (Equation 1 and 2) explaining the preference for self-employment and actual self-employment, including all explanatory factors and gender as a dummy variable[15]. We see that gender influences both the preference for self-employment and actual self-employment status. On average being a man increases the probability of preferring self-employment by 13.8 percentage points and that of being self-employed by 5.8 percentage points[16]. Calculating the marginal effect (dF/dx) for each of the explanatory variables for the female and male sample separately we find some evidence for gender differences with respect to the influence of specific variables on (preference for) self-employment. For example, we find that low education has a significant positive impact on preferences of women and no effect on those of men. Also, perception of administrative complexities has a significant negative effect on male preferences and no effect on female preferences[17]. Subsequent sections further explore differences in the effects of the explanatory variables on (preference for) self-employment for women and men by way of interaction effects.

When self-employment preference is left out in the analysis explaining actual self-employment the gender effect increases. This indicates that there is an indirect effect of gender through preferences on actual self-employment, i.e., preferences *mediate* the relationship between gender and actual self-employment. Hence, the lower preference for self-employment of women at least to some extent accounts for their lower entrepreneurial activity rates. Note that self-employment preference has a large positive effect on actual self-employment. After controlling for preferences the gender variable remains significant in the actual self-employment equation indicating that there are other forces at work determining the self-employment status.

It is important to create insight into the determinants of self-employment (preference) in order to understand the effects of gender through other explanatory variables, either with gender as a moderator, or the explanatory variables as mediators in the relationship between gender and (preference for) self-employment. That is why below we include a brief discussion of the effects of the different explanatory factors on both preferences and actual status.

[15] Country dummies are included with the United States as a base. For a discussion of country effects, we refer to Grilo and Thurik (2005a).
[16] Here we use the coefficients and profile for the explanatory variables for the female and male population in the sample.
[17] With respect to actual self-employment we find that age, low education, perception of administrative complexity and that of insufficient information have a significant effect on male self-employment and not on female self-employment.

Table 4: Effects on the probability of preference for self-employment and actual self-employment (including gender as a dummy variable)

	Self-employment preference			**Actual self-employment**		
	Coeff.	P-value	dF/dx	Coeff.	P-value	dF/dx
Constant	**0.469**	0.006	0.174	**-2.878**	0.000	-0.658
Gender	**0.373**	0.000	0.138	**0.253**	0.000	0.058
Self-employment preference	.	.	.	**0.944**	0.000	0.216
Age	**-0.022**	0.004	-0.008	**0.029**	0.001	0.007
Age/100 (squared)	**2.318**	0.008	0.860	-0.946	0.355	-0.216
Low education	0.016	0.746	0.006	**0.144**	0.014	0.033
High education	-0.038	0.242	-0.014	-0.056	0.171	-0.013
Self-employed parents	**0.271**	0.000	0.100	**0.473**	0.000	0.108
Perc. lack of financial support	**0.112**	0.003	0.042	-0.019	0.672	-0.004
Perc. administrat. complexity	**-0.106**	0.002	-0.039	**-0.175**	0.000	-0.040
Perc. insufficient info	0.061*	0.054	0.023	**0.100**	0.011	0.023
Perc. unfavorable econ. climate	**-0.118**	0.001	-0.044	0.025	0.541	0.006
Risk tolerance	**0.270**	0.000	0.100	0.075*	0.051	0.017
Internal locus of control	**0.090**	0.000	0.033	0.010	0.692	0.002
N	7914			7914		
LR chi^2 / Degrees of freedom	714.702	37		1140.248	38	
Prob>chi^2	0.000			0.000		
LogLikelihood	-5127.533			-3236.176		
Pseudo R^2	0.065			0.182		

Coefficients presented in bold are significant at the 5% level. Note that most variables are significant at the 1% level. * refers to a 10% significance level. The marginal effect dF/dx of each variable represents the change in the probability of (preference for) self-employment due to a one-unit change in that variable (or a discrete change from zero to one in the case of dummy variables). For each observation a one-unit change on the probability is calculated and the average of these changes is used to obtain an average marginal effect for each variable. P-values of these average marginal effects are comparable to the p-values of the coefficients, i.e., if coefficients are significant at the 1% level the corresponding marginal effects also appear to be significant at this level.

Determinants of (preference for) self-employment

Table 4 shows a U-shaped relationship between preference and age. Combining coefficients of the linear and quadratic age variable shows a negative relationship up to the age of 47 and a positive relationship at a later age. In addition, the results indicate a positive relationship between age and actual self-employment. Younger people (up to the age of 47), though more prone to prefer self-employment than older people, may not have the experience or resources to actually start a business and may (have to) wait till later in their lives start a business. In addition, older people (over 47) have a higher preference for self-employment explaining their higher likelihood of being self-employed.

People with a low level of education have a higher probability of being self-employed, perhaps indicating a lack of (other) employment opportunities. These results suggest a negative relationship between education level and self-employment, at least for low to medium education levels. The insignificance of high education suggests that the difference between medium and higher education levels plays no role in determining self-employment status.[18]

The presence of self-employed parents positively influences preferences and self-employment status. Contrary to what is expected on the basis of the literature also in later stages of the entrepreneurial

[18] Low and High education dummies are to be interpreted relative to the base category of Medium education (defined as age when finished full time education between 15 and 21).

process the influence of self-employed parents is visible. Not only do parents seem to inspire their children to have a taste for self-employment, the results also suggest that this influence materializes in their choice to become self-employed. This leads us to believe that there is support (e.g., in terms of advice or financial support) for the start-up[19]. Because 'self-employed parents' may be an indicator of available funding, the positive effect of perception of lack of financial support on preferences may also be understood in this light, i.e., the lack of financial support may be interpreted by respondents as the *general* availability of finance capital for new venture creation in a country, but also as the financial situation of the *individual*. This means that this positive effect refers to individuals who feel that in general there is a lack of financial support in their country but who personally have sufficient financial resources to start up a firm. We see that perception of insufficient information positively influences both preferences and actual status. This could be an 'experience' effect where entrepreneurs first realize there is a lack of information when actually gathering it to start up the business. While perception of administrative complexity negatively affects both preferences and actual self-employment, perception of an unfavorable climate only negatively affects preferences.

Whereas Shane and Venkataraman (2000) argue that risk tolerance is more influential in the exploitation than in the decision phase, we find that risk tolerance is more important for preferences than actual status. It may be that in the decision phase risks are perceived and calculated, whereas in the action phase individuals proceed and start up the firm (given these risks). Internal locus of control is only important in the decision (preference) phase. It may be that there are other (more action-oriented) personality characteristics, such as persistence, decisiveness, that explain active involvement in entrepreneurship.

Moderating effects of gender

As a first test of moderation effects of gender, we estimate Equation 1 and 2 including interaction variables of gender with the explanatory variables. This is quite similar to estimating Equations 1 and 2 for the female and male sample separately, but has the advantage of being able to include only the significant terms in the analysis. To single out relevant interaction terms a probit regression is performed including interaction terms for all the explanatory variables. The Likelihood Ratio test established that this model (including interaction effects for all explanatory variables and gender) was not significantly different from that presented in Table 4[20]. However, there appear to be interaction effects with gender for low education, self-employed parents and risk tolerance in the *preference* model, and for perception of an unfavorable economic climate in the *actual* self-employment model[21]. Table 5 presents the results of the probit equation including the significant interaction variables with gender.

[19] The positive effect of self-employed parents on the probability of self-employment may also be an indicator of children taking over the firm of the parents in case of a family business.

[20] The log-likelihood value of the restricted model amounts to -5127.533 and -3236.176 for preferences and actual self-employment, respectively. The log-likelihood value of the unrestricted model amounts to -5117.780 and -3231.839, respectively. For preferences the Likelihood Ratio is 19.506 (with a critical value of 19.675, 11 degrees of freedom and a 5% significance level). For actual self-employment the Likelihood Ratio is 8.674 (with a critical value of 21.026, 12 degrees of freedom and a 5% significance level).

[21] The significance of these individual interaction effects was tested using the Likelihood Ratio test, comparing the log-likelihood value of the restricted model (-5127.533 and -3236.176 as presented in Table 4) with that of the unrestricted model when including the interaction term (with gender) for a selected variable. The log-likelihood value of the unrestricted model for the interaction effects of gender with low education, self-employed parents and risk tolerance on preferences amounts to -5124.096; -5125.286 and -5125.595, respectively. The Likelihood Ratio for these variables amounts to 7.014; 4.494 and 3.876 ($p<0.05$), respectively. The log-likelihood value of the unrestricted model for the

Table 5: Effects on the probability of preference for self-employment and actual self-employment (including significant interaction variables)

	Self-employment preference			**Actual self-employment**		
	Coeff.	P-value	dF/dx	Coeff.	P-value	dF/dx
Constant	**0.509**	0.003	0.189	**-2.950**	0.000	-0.674
Gender	**0.315**	0.000	0.117	**0.364**	0.000	0.083
Self-employment preference	.	.	.	0.945	0.000	0.216
Age	**-0.022**	0.003	-0.008	**0.029**	0.001	0.007
Age/100 (squared)	**2.390**	0.007	0.885	-0.939	0.358	-0.215
Low education	**0.146**	0.041	0.054	**0.143**	0.014	0.033
High education	-0.036	0.269	-0.013	**-0.057**	0.162	-0.013
Self-employed parents	**0.193**	0.000	0.072	**0.472**	0.000	0.108
Perc. lack of financial support	**0.115**	0.002	0.043	-0.020	0.660	-0.008
Perc. administrat. complexity	**-0.105**	0.002	-0.039	**-0.175**	0.000	-0.040
Perc. insufficient info	0.061*	0.056	0.023	**0.098**	0.012	0.022
Perc. unfavorable econ. climate	**-0.117**	0.001	-0.043	0.128*	0.051	0.029
Risk tolerance	**0.218**	0.000	0.081	0.075*	0.053	0.017
Internal locus of control	**0.090**	0.000	0.033	0.010	0.696	0.002
Low education * gender	**-0.233**	0.010	-0.086	.	.	.
Self-employed parents * gender	**0.142**	0.031	0.053	.	.	.
Risk tolerance * gender	0.095	0.105	0.035	.	.	.
Perc. unfav econ climate * gender	.	.	.	**-0.161**	0.042	-0.037
N	7914			7914		
LR chi2 / Degrees of freedom	729.265	40		1444.386	39	
Prob>chi2	0.000			0.000		
LogLikelihood	-5120.251			-3234.107		
Pseudo R^2	0.066			0.183		

Coefficients presented in bold are significant at the 5% level. Note that most variables are significant at the 1% level. * refers to a 10% significance level. The marginal effect dF/dx of each variable represents the change in the probability of (preference for) self-employment due to a one-unit change in that variable (or a discrete change from zero to one in the case of dummy variables). For each observation a one-unit change on the probability is calculated and the average of these changes is used to obtain an average marginal effect for each variable. P-values of these average marginal effects are comparable to the p-values of the coefficients, i.e., if coefficients are significant at the 1% level the corresponding marginal effects also appear to be significant at this level.

To draw conclusions about the significance of the interaction effects one can look at the marginal effects of the interaction terms. The marginal effects presented in Table 5 are based upon the average of all observations. However, there are alternative ways of calculating these interaction effects including evaluating the marginal effects for the separate observations; calculating the effects at the mean of the variables; and calculating both the average marginal effects and the marginal effects at the mean for women and men separately. Using these 'alternative' approaches to calculating the interaction effects yields results comparable to those reported in Table 5.

Table 5 shows that the effect of low education on the *preference* for self-employment is larger for women than for men. Performing separate regressions for the female and male sample (not reported here) shows that low education has no significant effect on the preferences of men, while it has a positive effect for women. Hence, women with a low level of education (relative to medium

interaction effect of gender with the perception of an unfavorable economic climate on self-employment status amounts to -3234.107 and the Likelihood Ratio statistic amounts to 4.138 ($p<0.05$).

education) tend to have a preference for starting up a business, while for men with a similar level of education this is not the case. An important question here is whether women with a lower level of education have less employment opportunities available. The positive effect of self-employed parents is stronger for men than for women. In separate regressions for the female and male sample we find that for men the coefficient equals 0.33 (p=0.000) and for women 0.20 (p=0.000). Hence, if women and men have self-employed parents, men are more willing to follow in their parents' footsteps, taking advantage of their human capital and/or financial capital. This is in line with the findings of Matthews and Moser (1996). Table 5 also shows that the interaction effect of gender with risk tolerance is *almost* significant at the 10 percent level. This is an indication that risk tolerance is more important in determining the self-employment preference of men than that of women.

We see that interaction effects on *actual* self-employment are less frequent. Only for perception of an unfavorable economic climate there is a significant interaction effect with gender, indicating that the effect is larger for women than for men. Performing separate regressions for the male and female sample we find that the effect is negative and *not* significant for men and that for women the effect is positive and *nearly* significant at the 10 percent level (i.e., p=0.11). This suggests that the economic environment does not play a role in the self-employment decision of men, but may play a role for women. These results may be an indicator of the different experiences of women and men at start-up. It may be that women experience more problems and that they 'rate' the economic climate as more unfavorable than men[22].

We do not find an interaction effect of self-employment preference with gender on actual self-employment, indicating that women and men who have a preference to start up their own firm do not differ with respect to the impact of this preference on its materialization. This is an interesting finding which may indicate that women who want to start a business do not experience gender-related start-up barriers, other than the ones identified in the present study.

Indirect effects of gender

To investigate indirect gender effects on (preference for) self-employment, first we find out whether there are differences between women and men with respect to the explanatory variables. Table 6 presents mean differences between women and men in the sample for the explanatory variables included in the analysis as well as their significance. We see that women in the sample on average are younger than men; they are less likely than men to have attained a higher level of education; they are more likely to feel that (a) there is a lack of financial support, (b) there are administrative complexities, and (c) the economic climate for business start-up is unfavorable; they are less tolerant of risk; they are more likely to have an external locus of control and they have a lower preference for self-employment. We have seen from the results in Table 4 that several of these factors influence the preference for self-employment, actual self-employment or both, indicating that there are indirect gender effects through these variables.

[22] Note that this explanation assumes the existence of reversed causality. It may also be that women and men differ with respect to the degree in which they see 'problems' (pointing at a discrepancy between actual and perceived climate).

Table 6: Mean differences between women and men for the explanatory variables

variable	male average	female average	chi-square (P-value)
low education	0.123	0.113	2.008 (0.156)
high education	0.357	0.380	4.571* (0.033)
self-employed parents	0.280	0.263	2.857 (0.091)
perc. lack of fin. support	0.740	0.787	23.335** (0.000)
perc. administr. complex.	0.697	0.720	5.147* (0.023)
perc. insufficient info	0.447	0.449	0.016 (0.900)
perc. unfav. econ. climate	0.668	0.707	13.327** (0.000)
risk tolerance	0.511	0.479	8.213** (0.004)
internal locus of control	0.169	0.157	15.959** (0.000)
self-employment preference	0.560	0.411	173.731** (0.000)
			T-statistic (P-value)
age	40.95	39.96	-3.799** (0.000)

** significant at the 1% level (two-tailed); * significant at the 5% level (two-tailed)

Mediation tests are performed to test for indirect gender effects through the explanatory variables on (preference for) self-employment. Consider the following two equations:

(a) $Y = a_1 + b_1X + b_2Z + e$
(b) $Z = a_2 + cX + e$

Assume that Y represents (preference for) self-employment, Z is a selected explanatory variable and X is gender. To calculate the indirect effect of gender on (preference for) self-employment we use the Sobel Product of Coefficients: $b_{indirect} = b_2*c$. The significance of this coefficient can be tested using a t-test: $t_{indirect} = b_{indirect}/s_{indirect}$. To calculate the standard error for the indirect effect, we follow Sobel (1982) who proposed the following formula[23]: $s_{indirect} = \sqrt{c^2 s_{b2}^2 + (b_2)^2 s_c^2}$, where b_2 and c refer to the unstandardized coefficients of the effects of Z on Y and that of X on Z, respectively, and s_{b2} and s_c are the standard errors that belong to coefficients that belong to the coefficients b_2 and c.[24] Table 7 presents the coefficients of the indirect effects and their significance for the probit model[25]. Table 8 presents the values for b and b_2. Note that the values for b_2 correspond with the coefficients for (preference for) self-employment as reported in Table 4.

[23] Note that the original notation is as follows: $s_b = \sqrt{b^2 s_a^2 + a^2 s_b^2}$. For purposes of clarity we have made some adjustments in the notation.

[24] The Sobel (1982) method is often used in psychology (Calvete and Cardenoso, 2005; Gil et al., 2005) but is also applied in management and entrepreneurship (Van Dick et al., 2004; Rauch et al., 2005). Alternative methods to compute this standard error are proposed by Baron and Kenny (1986) and Goodman (1960). These methods include a squared term of the two standard errors for b_2 and c, which is small in case of small standard errors and a large sample size.

[25] Note that the Sobel method usually is applied in linear model specifications instead of nonlinear ones. When estimating the coefficients and their significance using a linear probability model we find that although the coefficients are smaller in the linear model, the signs and significance of the indirect effects are similar.

Table 7: Indirect gender effects on preference for self-employment and actual self-employment

Variable	Self-employment preference		Actual self-employment	
	$b_{indirect}$	$t_{indirect}$	$b_{indirect}$	$t_{indirect}$
age	**-0.022**	-2.298	**0.029**	2.448
low education	0.001	0.315	0.008	1.230
high education	0.002	1.026	0.003	1.152
self-employed parents	0.014*	1.654	0.024*	1.675
perc. lack fin. support	**-0.017**	-2.549	0.003	0.422
perc. administr. complex.	0.007*	1.835	**0.012**	2.006
perc. insufficient info.	-0.0002	-0.126	0.0004	-0.126
perc. unfav. econ. climate	**0.013**	2.519	-0.003	-0.604
risk tolerance	**0.022**	2.719	0.006	1.614
internal locus of control	0.002	0.790	0.001	0.394
self-employment preference	.	.	**0.355**	11.588

Table 8: Estimates for *b* and b_2

	b	***b_2* *(preference)***	***b_2* *(actual)***
age	**0.992**	**-0.022**	**0.029**
low education	0.052	0.016	**0.144**
high education	**-0.062**	-0.038	-0.056
self-employed parents	0.051*	**0.271**	**0.473**
perc. lack fin. support	**-0.151**	**0.112**	-0.019
perc. administr. complex.	**-0.068**	**-0.106**	**-0.175**
perc. insufficient info.	-0.004	0.061*	**0.100**
perc. unfav. econ. climate	**-0.108**	**-0.118**	0.025
risk tolerance	**0.081**	**0.270**	0.075*
internal locus of control	0.020	**0.090**	0.010
self-employment preference	**0.376**	-	**0.944**

Coefficients in bold are significant at the 5% level. Note that most variables are significant at the 1% level.
* refers to a 10 % level of significance

Table 7 shows several indirect effects of gender on (preference for) self-employment. Gender (i.e., being a man) has a negative indirect effect on *preference* for self-employment through the variables age and perception of lack of financial support. Men in the sample are older and are less likely to feel that there is a lack of financial support (see *b*-values in Table 8), whereas age and perception of lack of financial support have a negative and positive effect on preferences, respectively (see b_2 values in Table 8 or estimates in Table 4).

Gender appears to have a positive indirect effect on preferences through perception of an unfavorable climate, risk tolerance, and (to some extent – at a 10% significance level) self-employed parents and perception of administrative complexities. Men tend to be more risk tolerant (b=0.08; p<0.01), whereas risk tolerance leads to a higher preference for self-employment (b_2=0.27; p<0.001). Also, men are less likely than women to feel that there is an unfavorable economic climate (b=-0.11; p<0.001) or that there are administrative complexities (b=-0.07; p<0.05), whereas these perceptions have a significant negative effect on preferences. Also, men are somewhat more likely to have self-employed parents[26], positively influencing their preferences.

[26] This may be explained by the fact that we are working with a sample of the active (employed) population and that proportionally more daughters (than sons) of self-employed parents are inactive. We find that 38.9 percent of the men with self-employed parents are inactive versus 52.6 percent of the women. Most of these inactive individuals (whether female or male) are retired. However, we see that 17.5 percent of the inactive women were looking after the home versus only 0.6 percent of the inactive men.

From the results in Table 7 we also see that gender has a positive influence on *actual* self-employment through self-employment preference, age, perception of administrative complexities and (to some extent – at a 10% significance level) self-employed parents. Indeed, we find a strong indirect effect of gender through preferences on actual self-employment. Because women have a lower preference for self-employment (b=0.38; p<0.05), and preferences influence actual self-employment (b_2=0.94; p<0.05) they are characterized by lower self-employment rates. The perception of administrative complexities diminishes the odds that an individual is self-employed (b_2=-0.18; p<0.001), and we see that men are less likely to think that there are administrative complexities (b=-0.07; p<0.05). The fact that men are older and are more likely to have self-employed parents may be specific for the sample used.

"Direct" gender effects

In the previous sections we have argued that there are moderation and indirect effects of gender on (preference for) self-employment. However, the results show that there also is a direct (or residual) gender effect that can not be explained by way of the other explanatory variables included in the analysis (see Tables 4 and 5). When controlling for other factors relevant for explaining the self-employment decision that have not been included in the model, it is likely that the (direct) gender effect diminishes. Hence, there may be factors confounded with gender influencing (preference for) self-employment, but which have not been included in the analysis. It is important to unravel the (direct) gender effect through investigating the underlying factors associated with both gender and (preference for) self-employment. The Eurobarometer survey provides additional information on the reasons why individuals prefer to be an employee rather than self-employed. Insight into gender differences with respect to these reasons may contribute to our understanding of why women are less likely (to prefer) to be self-employed.

Gender differences with respect to the reasons to prefer wage-employment over self-employment are presented in Table 9. We see that women are more likely to indicate that wage-employment provides stability and indicate that it is less risky than self-employment. Also, women are more likely than men to express a lack of interest to become self-employed. These factors tend to refer to the willingness of an individual to become self-employed. Also, we see that women are more likely than men to indicate that they lack time, skills and knowledge to become self-employed. These factors refer to the ability of an individual to become self-employed. Thus, the lower preference of women for self-employment (i.e., the higher preference for wage-employment) may be explained by both a lower willingness and a lower (perceived) ability of women to become self-employed[27].

Table 9: Mean differences between women and men with respect to the reasons indicated to prefer wage-employment over self-employment (*N*=4009)

Reason	male average	female average	Chi-square (P-value)
stability of employment	0.289	0.260	4.227* (0.040)
lack of time	0.081	0.109	9.328** (0.002)
lack of interest	0.086	0.110	6.555** (0.010)
lack of skills	0.040	0.058	7.351** (0.007)
lack of knowledge	0.034	0.047	4.161* (0.041)
less risk	0.186	0.163	3.867* (0.049)

[27] This information was not available for respondents who indicated they had a preference for self-employment and/or are self-employed. This is why we could not include it in our model. Including these factors in the analysis is likely to result in a smaller direct gender effect, disentangling the effect of gender and that of other factors confounded with gender.

5. Discussion and Conclusion

This study deals with the factors influencing the probability of women and men to (wish to) be self-employed. Starting from a lower self-employment preference combined with a lower self-employment prevalence rate for women, it sets out to investigate the underlying mechanisms behind these gender differentials, distinguishing between different ways in which gender can exert an influence on the preference for and actual self-employment. Findings show evidence for moderating effects of gender, where gender moderates the relationship between (preference for) self-employment and other explanatory variables, as well as indirect effects of gender on the preference for and actual self-employment, through differences in the value for the (other) explanatory variables.

We find a strong indirect effect of gender on self-employment status through preferences, indicating that women are less likely to become self-employed because they are less willing to become self-employed. In addition, we do not find an effect of gender on the relationship between self-employment preference and actual self-employment, indicating that, if women and men have a preference to become self-employed, other things equal, they do not differ with respect to the impact of this preference on its materialization. Both findings indicate that it may be willingness rather than ability or gender-related barriers explaining the lower self-employment rate of women.

We have to be cautious drawing this conclusion for several reasons. First, if women start a business, this does not mean that they do not experience gender-related barriers. They may still face obstacles, but they may be persistent and do not refrain from starting a business in the face of these barriers. Second, the empirical results suggest that there are gender-related barriers. For example, we find that women are less likely to be self-employed because they are more likely to perceive administrative barriers. The higher likelihood of women to perceive administrative complexities that hinder new venture creation may be explained in terms of real barriers, where women have more negative experiences with administrative procedures at start-up. Indeed, administrative procedures may be more of a problem for women than for men as women tend to have less entrepreneurial experience (Carree and Verheul, 2006). However, this finding may also refer to a greater awareness of the administrative procedures to be fulfilled at start-up of women. They may be more perceptive and realistic than men on this issue. Furthermore, there may be a sector bias if the sectors that women choose to become active in are subject to higher administrative barriers. The present study does not 'pick up' these sector effects.

In general it may be argued that all perception variables may be interpreted in two different ways by the respondents (not necessarily related). Respondents can apply the perception questions to their own situation (i.e., their own experience with administrative barriers) or to the general entrepreneurial environment in a specific country or region (i.e., the entrepreneurs are discouraged by the existing structures).[28] The present study also includes perception variables for 'lack of financial support', and 'lack of sufficient information' that may be interpreted as referring to the general situation in a country (applying to all individuals), rather than the individual circumstances. Future research should make a clear distinction between individual-level factors and factors indicating the entrepreneurial climate in a country. In light of the existence of an indirect gender effect through perception of administrative complexity on self-employment and the absence of an effect of gender on the relationship between the perception of administrative complexity and self-employment, we are inclined to conclude that women either experience more difficulties with

[28] Indeed, the question asked to the respondents emphasizes the general nature of the statement: "It is difficult to start *one's* own business due to the complex administrative procedures".

administrative procedures – pointing at a gender-specific barrier – or that they simply are more aware of these procedures – creating an awareness barrier.

Third, the empirical results point at an interaction effect of gender and the perception of an unfavorable economic climate on actual self-employment. The economic climate seems to play a role for women, whereas it does not for men. This may be an experience effect (reversed causality) where women who have started a firm are more likely to have negative experiences with the economic climate than men. The types of firms that women start may be more vulnerable in times of economic downturns. For example, women tend to run small service firms, a sector that is affected first in case of a recession. However, one can also argue that the economic climate cannot be considered an important barrier for female entrepreneurship as women experience this ex-post (after start-up).

Finally, decomposing the direct gender effect on actual self-employment may lead to more insight into underlying mechanisms. Arguing that this direct gender effect is in fact a residual effect suggests that there are other factors (than those included in the analysis) that are confounded with gender that explain the probability of self-employment. Factors such as industry or entrepreneurial experience are not available for the present analysis while it is likely that these factors influence the entrepreneurial decision. Also, the lower self-employment preference of women may be explained in terms of willingness or ability. Gender differences in the reasons to prefer wage-employment over self-employment show that women are more likely than men to indicate that stability of employment, degree of risk involved and lack of interest is important for them. These factors refer to the *willingness* of women to become self-employed. In addition, women indicate that they lack the time, skills and knowledge to start a business. These can be considered *ability* factors explaining the lower preferences and actual involvement in entrepreneurial activity of women. The fact that women feel that they lack the appropriate skills and knowledge for self-employment may reflect a lower entrepreneurial self-perception of women, where women are less optimistic and have less confidence in their own capabilities than men (Niederle and Vesterlund, 2006; Verheul et al., 2005). Even though the perception of women may not reflect reality, it can be considered a gender-related barrier.

Further research in this field should create more insight into whether it is willingness or ability that explains the lower self-employment rate of women. From a policy perspective it is important to know whether it is their own choice or that gender-related barriers keep women from becoming actively involved in entrepreneurship. The present study shows that *at least* part of the explanation of the lower female self-employment rate can be found in the lower preference of women to become self-employed. This means that government policy aimed at encouraging women to become entrepreneurs, should not only focus upon removing barriers, but should also address women's preferences for and attitudes towards self-employment more directly. This can be done promoting entrepreneurship in the media, in particular media (e.g., television programs, magazines) that target women, making use of female role models. The latter may be of particular importance in the light of the lower entrepreneurial self-perception of women.

From a research perspective the present study adopts different ways of exploring gender effects on the preference for and actual involvement in self-employment. Merely including a gender dummy in the analysis is not sufficient to investigate why women are less likely (to prefer) to be self-employed. Distinguishing between moderation and indirect effects of gender enables to establish in what way gender influences entrepreneurship and to explore the extent to which the lower female self-employment rates are due to a lower willingness or capability (vis-à-vis men). A possible drawback of the model used is that we are not able to test for reversed causality. In particular for the perception variables this may play a role as perceptions can be formed on the basis of experience starting and running a business. Moreover, because both wage-employed and self-employed individuals

expressed a(n absence of) preference for self-employment, in this study preference for self-employment refers to both the preference to *be* self-employed (for people who already run a business) and the preference to *become* self-employed (for people who do not run a business and have a wish to do so). Even though it is reasonable to assume that preferences influence actual self-employment status (as modeled in Equation 2) we should be cautious discussing and interpreting the relationship between preferences and actual self-employment.

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