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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: This study has investigated the factors influencing the probability of women and men to be(come) self-employed. Starting from a lower self-employment preference combined with a lower self-employment prevalence rate for women, the present paper sets out to investigate the underlying mechanisms behind these gender differences, distinguishing between different ways in which gender can exert influence on self-employment (preference). Findings show evidence of moderating and indirect effects of gender. An important finding is that the lower self-employment rate for women may largely be attributed to their lower self-employment preference.

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1. Introduction

The topic of female entrepreneurship has attracted the attention of both researchers in the field of entrepreneurship and policy makers that have searched for ways to improve the entrepreneurial climate of a country enabling different groups of people to have a go at starting or running a business. At present the share of female entrepreneurs (whether measured in terms of newly founded firms or established businesses) amounts to less than 50 percent. Indeed, for all countries participating in the Global Entrepreneurship Monitor entrepreneurship (i.e., TEA) rates are lower for women than for men (Minniti et al., 2005; Reynolds et al., 2002)¹. Even when controlling for factors such as education, work experience and wealth, Bates (1995) finds that women are less likely to enter self-employment. Hence, women are still a potential and untapped resource in terms of participation in entrepreneurial activity.

For policy makers it is important to understand what determines the entrepreneurial activity of women and what causes the discrepancy between female and male entrepreneurial activity rates. Do women have different preferences to become entrepreneurs (i.e., are they less willing to become self-employed) or do they experience particular (gender-based) obstacles to entrepreneurship (i.e., are they less able to become self-employed)?² This dual question of whether it is willingness or ability inhibiting female entrepreneurial activity has implications for the way in which entrepreneurship is measured and incorporated in research that aims at creating a better understanding of gender differences in entrepreneurship. To be able to fully capture the determinants of female (versus male) entrepreneurship the present paper distinguishes between the preference for self-employment and the ‘realization’ of this preference into actual self-employment. The aim of this paper is to find out what determines these measures of entrepreneurship for women and men.

The study makes use of Flash Eurobarometer survey data for 2004 including observations from 15 old EU member states, 10 new EU members and the United States. This study builds on previous studies by Grilo and Irigoyen (2005) and Grilo and Thurik (2005a). Using survey data for 16 countries (instead of for 26) for 2001 and 2004, respectively, Grilo and Irigoyen (2005) and Grilo and Thurik (2005a) show that gender has impact on the preference to become self-employed as well as actual self-employment. The difference between the 2001 and the 2004 analyses is that Grilo and Irigoyen (2005, p.14) find that gender has a significant impact on the preference to become an entrepreneur (i.e., women are less likely to prefer self-employment over wage-employment), but that this differential in willingness between women and men does not materialize in the actual

¹ Note that the TEA rate is made up of nascent entrepreneurs (i.e., individuals who are actively involved in starting a new business) and entrepreneurs of young firms (i.e., businesses that are operated for less than 42 months). See Reynolds et al. (2002, p. 5). Also, Reynolds (1997) finds that being male has a positive impact on nascent entrepreneurship.

² Note that the existence of obstacles does not necessarily mean 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 wilkl find a way to achieve this objective*”. Persistence has been argued to be one of the main personal attributes of an entrepreneur. A distinction can also be made between personal capabilities and the opportunities offered by the environment (e.g., Verheul et al., 2002).

professional status³, whereas Thurik and Grilo (2005a) find that gender not only has an influence on preferences but also on actual self-employment (even after controlling for preferences). This is in line with the findings in other studies (Minniti et al., 2005; Reynolds et al., 2002; Reynolds, 1997; Blanchflower et al., 2001). Grilo and Thurik (2005a, p.17) argue this calls for a detailed investigation of the reasons behind the gender differential in willingness to be an entrepreneur and acting upon it. This is the aim of the present study.

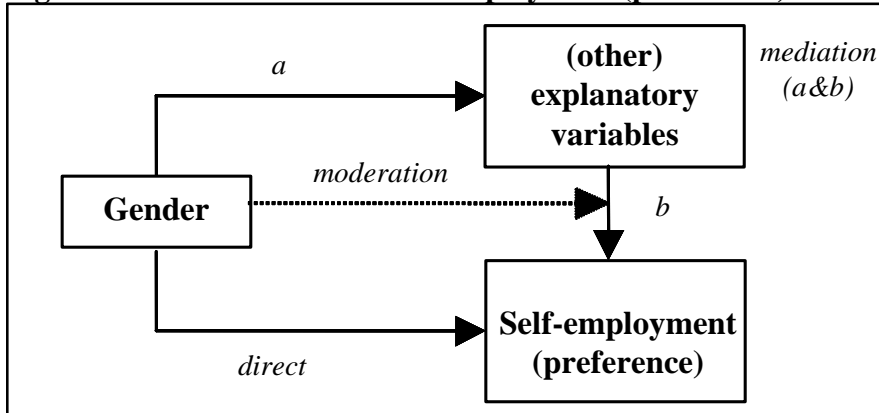
If women are less likely to have a preference for self-employment and are also less likely to engage in actual self-employment than men, it is interesting to find out what causes this gender difference. Generally, research in entrepreneurship has investigated gender effects by simply including a gender dummy in the analysis. Although this gives some insight into gender effects, it is by no means sufficient to provide conclusive evidence, and one should bare in mind that this is just one way of investigating gender effects. Women and men have different characteristics and different roles in society, which may lead to a different (preference for) self-employment and – given these characteristics – the effect may be different for women and men.

In effect, when investigating gender differences, a distinction can be made between moderation and mediation effects (e.g., Baron and Kenny, 1986; James and Brett, 1984). One refers to (complete) *mediation* when the relationship between a proposed antecedent (e.g., gender) and the consequence (e.g., self-employment) disappears if the mediating variable is included in the model. In case of *moderation*, the effect of an explanatory variable on the dependent variable (e.g., self-employment) is moderated by another variable (e.g., gender). In other words, the relationship between two variables is dependent upon a third variable (i.e., interaction effect). Verheul (2005) distinguishes between direct and indirect effects of gender on entrepreneurship, thereby referring to and testing for the existence of factors mediating the relationship between gender and entrepreneurship.

The present study aims at explaining gender effects on self-employment (preference), using different ways to test for gender differences. The study is build around the following model (see Figure 1). Gender can have an *indirect (or mediated) effect* (through gender differences with respect to other explanatory variables) on self-employment (preference); a *direct effect* (i.e., the effect of gender that remains after controlling for the effects of other explanatory variables) and a *moderation effect* (influencing the relationship between explanatory variables and self-employment).

³ It has to be noted though that when leaving out variables such as the preference for entrepreneurship and (perceived) obstacles (e.g., financial support, administrative complexities and risk tolerance) – in line with Blanchflower et al. (2001) – the gender effect almost becomes significant.

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



Based upon the effects presented in Figure 1 it can be argued that a gender difference in self-employment (preference) can be due to a mediation or moderation effect. The direct effect can be considered a *residual* effect, as it is likely that if such a gender effect prevails, there are other underlying variables that have not been accounted for.

Although there have been some studies investigating gender effects in entrepreneurship, distinguishing between indirect and moderation effects of gender (e.g., Collins-Dodd et al., 2004)⁴, few studies have made a systematical distinction between the different effects of gender on the probability of self-employment. For example, Blanchflower et al. (2001) investigate effects on the probability of preference for self-employment and being self-employed for women and men separately (i.e., interaction or moderation effects), but they do not discuss indirect effects through differences in the mean values between women and men for the determinants under investigation (i.e., indirect or mediation effects). This is also true for Burke et al. (2002) investigating effects on the probability of self-employment. Investigating effects on nascent entrepreneurship, Arenius and Minniti (2005) include gender as a dummy variable and investigate interaction effects of gender with the other explanatory variables, but again there is no discussion of indirect or mediation effects.

Findings thusfar indicate that there is more evidence for indirect gender effects than for moderation effects, where the influence of a certain factor is different for women and men. Indeed, Arenius and Minniti (2005, p. 242) find that the relationships between the likelihood of becoming a nascent entrepreneur and the explanatory variables are not dependent upon gender. Although Burke et al. (2002) find evidence of different effects for a selection of human capital variables (e.g., post-compulsory education; vocational and professional qualifications) for women and men, they do not test whether these differences are significant. See also Blanchflower et al. (2001). The present study aims at discussing, investigating and testing for the different gender effects on the interest in and the decision to become self-employed.

⁴ Studies in Verheul (2005) mainly investigate (in)direct gender effects, including gender as a dummy and looking at gender differences in underlying factors without paying much attention to interaction or moderation effects.

In the present study we discuss and investigate gender differences with respect to the explanatory factors of (preference for) self-employment as well as how gender may change the relationship between these factors and (preference for) self-employment.

The set-up of this study is as follows. First, there is a discussion of the determinants of self-employment (preference). Note that this discussion builds upon the discussion in Grilo and Irigoyen (2005) and Grilo and Thurik (2005a), and is limited to the (explanatory) factors that are available in the Eurobarometer data set. We will also discuss gender differences with respect to the identified 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 a dependent variable has a different value for women and men (in line with the mediation effect)? Using 7914 observations gathered from 26 countries in the empirical analysis we aim to explain the origin of gender differences in self-employment preference and status, testing for the different gender effects as presented in Figure 1. Following Grilo and Irigoyen (2005) and Grilo and Thurik (2005a) two probit equations are estimated. We will end with a conclusion and some policy recommendations.

2. Determinants of Self-Employment

Studying 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 that of 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. Within the framework approach these different disciplines are brought together to explain entrepreneurship as a multi-faceted phenomenon. For example, the Eclectic Framework introduced by Audretsch et al. (2002) includes components from different disciplines and spans different levels of analysis to determine the occupational choice of an individual. The present study is largely empirical in nature.

Preferences for self-employment, which may be considered a measure of latent entrepreneurship, have been far less analyzed as compared to actual entrepreneurship (Blanchflower et al., 2001). Although the concept of latent entrepreneurship differs from that of nascent entrepreneurship (where the latter is probably more advanced in the sense that actual steps are undertaken with respect to starting a business rather than just thinking about it) we will also pay attention to the nascent entrepreneurship literature (see Thurik and Grilo, 2005). Davidsson and Honig (2003)⁵ distinguish between discovery and exploitation, arguing that these two measures of entrepreneurial activity are influenced by different factors.

There is a large set of variables that have been found to influence the choice for self-employment of an individual in the (empirical) literature. Because the occupational choice is in essence an individual decision, the present paper focuses on individual-level

⁵ Based upon the approach of Venkataraman (2000).

determinants of (the preference for) self-employment. Van Praag and Van Ophem (1995) argue that insight into 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 programmes. Verheul et al. (2002) argue that the entrepreneurial decision is made at the individual level, taking into account entrepreneurial opportunities and resources, ability, personality traits and preferences of the individual.

Anticipating upon using the Eurobarometer data set in the present discussion we will focus upon the following (groups of) determinants of (preference for) self-employment: demographics (age and gender); human capital (education); social capital (self-employed parents); personality factors (risk attitude and locus of control) and individual perceptions of the environment (perception of financial support; administrative complexity; availability of information; and the economic climate).⁶ Following Arenius and Minniti (2005) we argue that perceptual variables tend to be important in determining (preference for) self-employment. Subjective perceptions of the environment by an individual may be more likely to influence the start-up decision than the actual (objective) 'status' of the environment. In this section a brief overview is given of the influence of these determinants on (preference for) self-employment, whereas the next section discusses gender effects with respect to these factors.

Demographic Variables: Age

Many business owners are within the age category of 25 to 45 years old (Storey, 1994; Reynolds et al., 1999), it peaks as people approach the age of 40 and levels out (Bates, 1995). Nascent entrepreneurship rates 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 (2005) argue that when individuals are older, wage-employment becomes more attractive than self-employment. Female entrepreneurs may have a different age profile than male entrepreneurs. 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 employment for women. Matthews and Moser (1996, p. 40) note that women tend to be older when they start a business for the first time⁷. This may indicate that women and men of the same age differ with respect to the preference for and the decision to become self-employed. However, Arenius and Minniti (2005) do not find evidence for an interaction effect of age and gender on nascent entrepreneurship.

⁶ We note that this list of determinants is by no means exhaustive, but that for each *group* of determinants it includes one or several important determining factors.

⁷ Education may be an important mediating variable as lower educated women are expected to have children at a younger age and may enter and/or exit the labor market (self-employment) at a different age than higher educated women. The relationship between age and self-employment may also be confounded with that of experience as we may expect that older people have more experience in the labor market enabling them to engage in new venture creation more easily.

Human Capital: Education Level

Human capital may refer to general and specific knowledge (Becker, 1993; Castanias and Helfat, 1991; 2001). General knowledge can be acquired through education whereas specific knowledge refers to e.g., entrepreneurial and industry experience⁸. Individuals with higher levels of human capital may be better at perceiving entrepreneurial opportunities, and therefore more likely to engage in entrepreneurial activity (Davidsson and Honig, 2003).

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 (2004) 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) argue that this relationship is negative up to the level of 'intermediate' education and does not appear for higher levels of education. Education has also been found to have a nonlinear relationship with the probability to become an entrepreneur (Bellu et al., 1990; Evans and Leighton, 1989; Reynolds, 1997; Grilo and Irigoyen, 2005). With respect to earlier stages of entrepreneurial activity (e.g., preference for self-employment and nascent entrepreneurship) positive effects have been reported (Blanchflower et al., 2001; Grilo and Irigoyen, 2005; Davidsson and Honig, 2003; Delmar and Davidsson, 2000; Arenius and Minniti, 2005)⁹. Davidsson and Honig (2003, p. 322) point out that while education increases the probability of becoming a nascent entrepreneur, in later stages more specific human capital will be important.

Women and men tend not 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. 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). Bates (1995) finds that relative to men, women appear to rely more heavily upon advanced education in their decision to become self-employed¹⁰. 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.

⁸ Although age and gender are discussed under the heading of 'demographic factors' they may also be considered human capital factors as they may serve as proxies for life experiences and access to resources that facilitate the new venture creation process.

⁹ Note that Davidsson and Honig (2003) did not find an effect of education in later (i.e., exploitation) stages of the business

¹⁰ Bates (1995) relates this strong effect of education level on female self-employment to sector choice, where education level appears to be particularly important in skilled services, a sector where women are (more) likely to be concentrated.

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) content 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, family background (i.e., parental role models) has 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; Sander and Nee, 1996; Scherer et al., 1989; Shapero and Sokol, 1982; Timmons, 1986). Dunn and Holtz-Eakin (2000) argue that the positive influence of family background is related to the availability of family financial capital and the development of relevant human capital. Having entrepreneurial parents may be more important for the interest in self-employment than for later (action) stages in the entrepreneurial process, where role models and support from outside the family becomes more important (Davidsson and Honig, 2003; Matthews and Moser, 2003)¹¹.

It has been found that self-employed women are likely to have a *self-employed parent* (Brush, 1992; Waddell, 1983)¹². Matthews and Moser (1996) explore the question whether men and women are equally influenced by role models. They find that men with a family background in small business expressed a higher interest in small business ownership than women with such background¹³. Family background does not seem to positively influence women’s interest in owning a business. Also, Hout and Rosen (2000) find that for both women and men the probability to become self-employed 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 characteristics important for displaying entrepreneurial behavior: need for achievement, internal locus of control and risk-taking propensity. The latter two are included and investigated in the present study. In both the theoretical and empirical literature entrepreneurship has 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;)¹⁴. It has been found that the probability of becoming and staying self-employed increases with risk tolerance (Grilo and Irigoyen, 2005; Parker, 1996). Shane and Venkataraman (2000) note that risk tolerance may be more influential in the exploitation phases of entrepreneurship than in earlier (decision) phases¹⁵.

¹¹ Davidsson and Honig (2003, p. 322) argue that : “*Bridging social capital becomes increasingly important relative to bonding social capital as the process progresses*”.

¹² In his study Waddell (1983) finds that 63 of the female entrepreneurs had self-employed fathers and 36 percent had self-employed mothers.

¹³ Moreover, this difference increased over the (next) five years (Matthews and Moser, 1996, p. 41).

¹⁴ Note however that other research (e.g., Brockhaus and Nord, 1979; Brockhaus, 1980; Brockhaus and Horwitz, 1986) has argued that risk-taking is not a distinctive feature of entrepreneurship.

¹⁵ Arenius and Minniti (2005) find that fear of failure has a negative impact on nascent entrepreneurship.

Women appear to have a lower propensity to take risk (i.e., are more risk averse) than men (men) (Verheul and Thurik, 2001; Sexton and Bowman-Upton, 1990; Masters and Meier, 1988) 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 of fear of failure with women's entry into self-employment.

The concept of *locus of control* was proposed first by Rotter (1966). Locus of control can be seen as a continuum where an individual believes that either (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). Individuals are likely to succeed in an activity if they attribute the reasons for their success to internal, stable and intentional factors while attributing failures to external, variable or accidental factors (Gatewood et al., 2005). Entrepreneurs have 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).

As compared to men women have a more external locus of control as they often do not take credit for success, attributing success to external sources or luck rather than to 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, p. 383) 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 think 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.

(Perceptions of the) Environment for Entrepreneurship

In addition to individual characteristics, the environment for entrepreneurship may 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* which consume time and money and may discourage people to start a business (World Bank, 2005; OECD, 1998)¹⁶; (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 that are involved in new venture creation and enables them to efficiently start or run a business; (iii) *access to finance*, an important entry barrier for self-employment (Evans and Jovanovic, 1989; Bates, 1995) in particular since investors tend to be reluctant to invest in small and new firms because of the lack of a track record, the high risk and the fixed cost element of transactions (Berger and Udell, 1998; Chittenden et al., 1996; Cressy, 2005); and (iv) the *general economic*

¹⁶ Coping with administrative regulations has been cited as the third most important constraint (after finding skilled labor and access to finance) in the former Europe-19 countries (KPMG/ENSR, 2002). For a discussion of the different types of administrative costs, see The World Bank (2005).

climate, determining the opportunities available for entrepreneurial activity as well as the risks and rewards of setting up shop (Verheul et al., 2002)¹⁷.

Since the decision to become self-employed is made at the individual level, it is probably not the actual environment for entrepreneurship that is a predictor of the self-employment decision, but rather the perception of this environment by individuals (Arenius and Minniti, 2005; Van Stel and Stunnenberg, 2004). Van Stel and Stunnenberg (2004, p. 8) argue that: '*Perceived complexity is the information that is actually used in the start-up decision by potential entrepreneurs, irrespective of whether or not the information is correct*'. Assuming that the occupational choice is made by individuals in the present study we include perceptions of the entrepreneurial environment rather than objective measures of this environment¹⁸.

Arenius and Minniti (2005) find that the relationship between the likelihood of becoming an entrepreneur and the *perceptual variables* does not depend upon gender¹⁹. However, if women (think they will) experience more problems with the acquisition of financial capital, for example, because of gender-based discrimination by lenders and financial institutions, this may influence their perception of available financial support²⁰. 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 size of administrative complexities and whether there is sufficient information available on starting up and running a firm.

3. Methodology

Data Source, Sample Characteristics and Description of Variables

For the analysis of the gender effects on the (preference for) self-employment use is made of data from the Flash Eurobarometer survey for 2004. This survey is conducted for a random sample of the general population from 26 countries, including the 15 old EU member states, ten new EU member states and the United States²¹. The total number of observations used for the present study amounts to 7914 of which 4356 and 3558 refer to

¹⁷ In the literature the level of unemployment is often referred to as an indicator of the general economic climate (Grilo and Thurik, 2005c). For a discussion of the complex relationship(s) between unemployment and self-employment, see for example Audretsch et al. (2005), Carree (2002) and Storey (1991).

¹⁸ It may be that although perceptions play a role in the start-up decision, the actual implementation may be more dependent upon the objective environment. Also, perceptions of individuals (albeit incorrect) may still be highly correlated with the actual environment. For example, it can be expected that most entrepreneurs can not circumvent administrative regulations and, accordingly, will engage in information gathering activities.

¹⁹ Arenius and Minniti (2005) investigate the following perceptual variables: perception of one's own skills, likelihood of failure, existence of opportunities, and knowledge of other entrepreneurs.

²⁰ 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).

²¹ This survey was conducted on behalf of the European Commission's Enterprise Directorate-General, and 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

male and female respondents, respectively²². The number of observations for the different countries included in the data set varies from 146 and 149 for Malta and Slovenia (resp.) to 490 and 501 for Germany and the United States (resp.). The minimum number of female observations 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).

Following Grilo and Thurik (2005a) and Grilo and Irigoyen (2005), in the present study two indicators of entrepreneurship are used. First of all, self-employment preference is measured by the following question: ‘*Suppose you could choose between different kinds of jobs, which one would you prefer: being an employee or being self-employed?*’²³. 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?*’.

For the present sample we find that on average women are less likely to show a preference for self-employment (vis-a-vis wage-employment) and are also less likely to be self-employed. See Table 1. Of the women in the sample 41 percent show a preference for self-employment against 56 percent for men. For actual self-employment these percentages amount to 14 and almost 25 percent for women and men, respectively.

Table 1: Gender differences in preference for self-employment and actual self-employment

| | Male (std. error) | Female (std. error) | Chi-square (P-value) |
|----------------------------|------------------------------|--------------------------------|---------------------------------|
| Self-employment preference | 0.560 (0.496) | 0.411 (0.492) | 173.73** (0.000) |
| Actual self-employment | 0.245 (0.430) | 0.144 (0.351) | 126.99** (0.000) |

Table 2 gives a description of the explanatory variables used in the empirical analysis to explain (preference for) self-employment. In addition to these variables, preference for self-employment is also used as an explanatory variable for actual self-employment (see Equation 1).

²² Note that the total number of observations in the 2004 Entrepreneurship Flash Eurobarometer survey amounts to more than 13,500. However, for the present study we have removed observations with no answer to one of the questions used in the analysis. See Table 1 for an overview of the questions used.

²³ A drawback of such a measure of entrepreneurship is that an individual may think that self-employment is relatively interesting as compared to wage-employment (because of favorable attributes, such as being your own boss, flexible working hours, etc.) but that (s)he does not actually engage in starting a firm. In other words, this question may be more likely to measure a general opinion rather than a preference that leads to concrete action (e.g., Blanchflower et al., 2001; Grilo and Irigoyen, 2005; Grilo and Thurik, 2005a).

Table 2: 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 |
| Education | The education variable is measured in terms of age when finished full time education. It has value '1' if never engaged in full time education, and its value equals that of 'age' if still in fulltime education or when finished full time education. |
| Low education | Dummy variable with value 1 if < 15 and 0 otherwise. |
| High education | Dummy variable with value 1 if > 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: <i>It is difficult to start one's own business due to a lack of available financial support.</i> 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: <i>It is difficult to start one's own business due to the complex administrative procedures.</i> 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: <i>It is difficult to obtain sufficient information on how to start a business.</i> 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: <i>The current economic climate is not favorable for people who want to start their own business.</i> 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: <i>One should not start a business if there is a risk it might fail.</i> 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. |

Model and Analysis

For the empirical analysis we used an equation-by-equation probit estimation. Given the recursive nature of the model the procedure provides consistent estimators provided that the error terms are uncorrelated across equations. We estimated probit equations for the probability of revealing a preference for self-employment and that of actually being self-employed (e.g., Grilo and Irigoyen, 2005). More precisely, these equations can be formulated as follows:

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

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

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

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 contingent upon the preference for self-employment (y_1).

For both equations: $X = (1, \text{men}, \text{age}, (\text{age}/100) \text{ squared}, \text{low education}, \text{high education}, \text{self-employed parents}, \text{the existence of administrative complexities}, \text{difficulty obtaining sufficient information}, \text{unfavorable economic climate}, \text{risk tolerance}, \text{internal locus of control}, \text{country dummies})$. A detailed description of the explanatory (independent) variables is given in Table 1²⁴.

We have seen in Table 1 that on average women 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. We estimate Equation (1) and (2) including interaction effects of gender with the (other) explanatory variables to find out whether influences of the explanatory factors on (preference for) self-employment work out differently for men and women. Also, coefficients for the indirect effects are calculated and tested for significance.

In the next section we present the results of our investigation of the origin of these gender differences in (preference for) self-employment.

²⁴ In the present study we assume that preferences and actual self-employment are determined by similar factors, which does not necessarily have to be the case.

4. Results

Correlation Analysis

As a preliminary investigation of the relationship between gender and the other variables we present correlations in Table 3. Gender is correlated with both preferences and actual self-employment. Further, we see that gender 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 there are gender differences to be further explored in the next sections.

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 0.05-level (2-tailed); ** Correlation is significant at the 0.01-level (2-tailed).

Testing for Gender Effects

Women in the sample are less likely to show a preference for self-employment and are also 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 (see also the correlations in Table 3). In addition, the influence of the explanatory factors may be different for women and men. In the present section we will investigate the different ways in which gender may exert influence on (preference for) self-employment trying to explain their lower engagement at different stages of the self-employment (decision).

I: Gender as a dummy variable

In Table 4 we present the results of the probit analysis (Equation 1 and 2) explaining both the preference for self-employment and actual self-employment, including all explanatory factors and gender as a dummy variable. Although we controlled for country effects (including country dummies), we refrain from presenting and discussing these effects as the main purpose of the present study is to investigate gender effects²⁵.

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 | | |
|--|----------------------------|-----------|--------|------------------------|-----------|--------|
| | Estimate | Est./S.E. | dF/dx | Estimate | Est./S.E. | dF/dx |
| Constant | 0.469 | 2.762 | 0.174 | -2.878 | -13.523 | -0.658 |
| Gender | 0.373 | 12.715 | 0.138 | 0.253 | 6.867 | 0.058 |
| Self-employment preference | . | . | . | 0.944 | 24.356 | 0.216 |
| Age | -0.022 | -2.897 | -0.008 | 0.029 | 3.216 | 0.007 |
| Age/100 (squared) | 2.318 | 2.636 | 0.860 | -0.946 | -0.925 | -0.216 |
| Low education | 0.016 | 0.324 | 0.006 | 0.144 | 2.469 | 0.033 |
| High education | -0.038 | -1.170 | -0.014 | -0.056 | -1.368 | -0.013 |
| Self-employed parents | 0.271 | 7.999 | 0.100 | 0.473 | 12.090 | 0.108 |
| Perc. lack of financial support | 0.112 | 2.999 | 0.042 | -0.019 | -0.424 | -0.004 |
| Perc. administrat. complexity | -0.106 | -3.118 | -0.039 | -0.175 | -4.287 | -0.040 |
| Perc. insufficient info | 0.061* | 1.929 | 0.023 | 0.100 | 2.558 | 0.023 |
| Perc. unfavorable econ. climate | -0.118 | -3.478 | -0.044 | 0.025 | 0.612 | 0.006 |
| Risk tolerance | 0.270 | 8.619 | 0.100 | 0.075* | 1.954 | 0.017 |
| Internal locus of control | 0.090 | 4.439 | 0.033 | 0.010 | 0.396 | 0.002 |
| <i>N</i> | 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 percent level. Note that most variables are significant at the 1 percent level of significance. * refers to a 10 percent level of significance.

²⁵ Country dummies are included with the United States as a base. For a discussion of country effects, we refer to Grilo and Thurik (2005a).

From Table 4 we see that gender influences both the preference for self-employment and actual self-employment status. The effect of gender is larger for self-employment *preference* than for *actual* self-employment (i.e., the elasticity is 0.138 for self-employment preference and 0.058 for self-employment status). However, if you remove self-employment preference from the analysis explaining actual self-employment, the gender effect increases, indicating that there is an indirect gender effect on actual self-employment through preferences. Hence, it is likely that the lower preference of women for self-employment at least to some extent accounts for the lower actual self-employment status as self-employment preference has a large positive effect on actual self-employment.

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

II: Effects of other variables

From Table 4 we see that there is a U-shaped relationship between preference for self-employment and age, where both younger and older people have a higher preference to be self-employed. However, there is some indication of a reversed U-shaped relationship with age for actual self-employment. It seems that people who are ‘dreaming about starting a business’ do not always start a business and vice-versa. Younger people may not have the experience to actually start a business, whereas older people may lack the energy to make their ‘dream’ come true.

People who have a higher probability of becoming self-employed are also characterized by a relatively low education level, perhaps indicating a lack of (other) employment opportunities for those individuals. No evidence is found for a positive relationship between education level and self-employment.

Whether an individual has self-employed parents positively influences both preferences and self-employment status, with the effect being somewhat larger for actual self-employment. Hence, contrary to what is argued in the literature, also in later stages of the entrepreneurial process the influence of self-employed parents is visible. Not only do parents seem to inspire their children to become self-employed, there is also reason to believe that there is support for starting up (e.g., advice or financial support)²⁶. Because ‘self-employed parents’ may be an indicator of funding available to an individual (e.g., Dunn and Holtz-Eakin, 2000) the positive effect of ‘perception of lack of financial support’ on preferences²⁷ may also be understood in this light, where lack of financial support may be interpreted by respondents as the *general* availability of finance capital

²⁶ The positive effect of self-employed parents on the probability of becoming self-employed may also be an indicator of children taking over the firm of the parents in case of a family business.

²⁷ According to Thurik and Grilo (2005a) this may suggest that respondents who perceive that there is a lack of financial support (or information) are more prone to start a business.

for new venture creation in a country, but also as the financial situation of the *individual*. This means that the positive effect of ‘perception of lack of financial support’ may refer to those 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 also be an ‘experience’ effect, where potential entrepreneurs realize there is a lack of information when they actually gather it in order to start up the business²⁸. Unlike perception of administrative complexity, perception of an unfavorable climate only negatively affects preferences.

Where Shane and Venkataraman (2000) argue that risk tolerance tends to be more influential in the exploitation than in the decision phase, we find that risk tolerance has a larger effect on preferences than on actual status. It seems 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 (i.e., preference) phase. To conclude, it may be argued that there are other (more action-oriented) personality characteristics, such as persistence, decisiveness, that are more important in later phases of the entrepreneurial process.

III: Moderating effects of gender

As a first test of gender effects, we estimate Equation 1 and 2 including interaction variables of gender and the explanatory variables. This is quite similar to estimating Equation 1 and 2 for the female and male sample separately, but has the advantage of the possibility of including only the relevant (i.e., significant) interaction terms of gender and the explanatory variables in the analysis. To single out relevant interaction terms, a probit regression was 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 4²⁹. However, there appear to be interaction effects with gender for low education, self-employed parents and risk tolerance in the *preference* model and perception of an unfavorable economic climate in the *actual* self-employment model³⁰. Table 5 presents the results of the probit equation including the relevant interaction variables with gender.

²⁸ This may also be valid for the ‘lack of financial support’ variable. Note that in this study we did not control for reversed causality.

²⁹ The log-likelihood value of the restricted model for preferences and actual self-employment amounts to -5127.533 and -3236.176, 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 df and a 5% significance level). For actual self-employment the Likelihood Ratio is 8.674 (with a critical value of 21.026, 12 df and a 5% significance level).

³⁰ 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 the 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 interaction effect of

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 | | |
|-----------------------------------|----------------------------|-----------|----------|------------------------|-----------|--------|
| | Estimate | Est./S.E. | dF/dx | Estimate | Est./S.E. | dF/dx |
| Constant | 0.509 | 2.982 | 0.189 | -2.950 | -13.662 | -0.674 |
| Gender | 0.315 | 6.867 | 0.117 | 0.364 | 5.487 | 0.083 |
| Self-employment preference | . | . | . | 0.945 | 24.372 | 0.216 |
| Age | -0.022 | -2.969 | -0.008 | 0.029 | 3.215 | 0.007 |
| Age/100 (squared) | 0.239 | 2.717 | 0.885 | -0.939 | -0.920 | -0.215 |
| Low education | 0.146 | 2.047 | 0.054 | 0.143 | 2.449 | 0.033 |
| High education | -0.036 | -1.105 | -0.013 | -0.057 | -1.397 | -0.013 |
| Self-employed parents | 0.193 | 3.882 | 0.072 | 0.472 | 12.075 | 0.108 |
| Perc. lack of financial support | 0.115 | 3.074 | 0.043 | -0.020 | -0.439 | -0.008 |
| Perc. administrat. complexity | -0.105 | -3.078 | -0.039 | -0.175 | -4.293 | -0.040 |
| Perc. insufficient info | 0.061* | 1.909 | 0.023 | 0.098 | 2.525 | 0.022 |
| Perc. unfavorable econ. climate | -0.117 | -3.442 | -0.043 | 0.128* | 1.948 | 0.029 |
| Risk tolerance | 0.218 | 4.851 | 0.081 | 0.075* | 1.936 | 0.017 |
| Internal locus of control | 0.090 | 4.459 | 0.033 | 0.010 | 0.391 | 0.002 |
| Low education * gender | -0.233 | -2.574 | -0.086 | . | . | . |
| Self-employed parents * gender | 0.142 | 2.151 | 0.053 | . | . | . |
| Risk tolerance * gender | 0.095 | 1.621 | 0.035 | . | . | . |
| Perc. unfav econ climate * gender | . | . | . | -0.161 | -2.029 | -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 percent level of significance. Note that most variables are significant at the 1 percent level of significance. * refers to a 10 percent level of significance.

With respect to the interaction effects we see from Table 5 that low education has a larger impact on the *preference* for self-employment for women than for men. More specifically, we see that low education has no effect for men and a positive effect for women. Hence, women with a low level of 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 if women with a lower level of education have fewer employment opportunities available.

The positive effect of self-employed parents is stronger for men than for women. Hence, if women and men have self-employed parents, men are more likely to be *willing* to follow in their parents' footsteps, taking advantage of their specific human capital and/or available financial capital. This is in line with the findings of Matthews and Moser (1996). We see in Table 5 that the interaction effect of gender with risk tolerance is almost significant at the 10 percent significance level. This is an indication that risk

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).

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. For men, there is no effect, while for women we see that perception of an unfavorable economic climate is positively related to the probability of self-employment. This may be an indicator of the negative experiences of women who start up firms or of their more realistic attitude. In the latter respect men may be more likely to disregard the economic climate and just go ahead and start, whereas women may be more perceptive of and sensitive to the environment. If women start a firm despite their negative perception of the environment, this may be an indication of their persistence levels³¹.

It is interesting to see that we do not find an interaction effect of self-employment preference with gender on actual self-employment, indicating that when women and men have a preference to start up their own firm, they do not differ with respect to the materialization of such a wish. This suggests that women who want to start a business do not appear to experience more barriers to start-up than men do, i.e., that there are no important gender-related barriers to running a business. Hence, willingness may be more important in explaining the relatively low self-employment status than ability. We will test for and discuss the indirect effect of gender through self-employment preference on actual self-employment status in the next section.

IV: Indirect effects of gender

To investigate the existence of indirect effects of gender on self-employment (preference) through the other explanatory variables, we first want to find out whether there are gender differences with respect to these explanatory variables. Table 6 presents the mean differences between women and men in the sample with respect to the explanatory variables included in the analysis. Chi-square statistics are reported. For a description of variables, see Table 2.

³¹ Note that reversed causality may be an issue here.

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

| variable | male average (std. error) | female average (std. error) | chi-square (P-value) |
|----------------------------|------------------------------|--------------------------------|-------------------------|
| age | 40.95 (11.99) | 39.96 (11.19) | 118.14** (0.000) |
| low education | 0.123 (0.329) | 0.113 (0.316) | 2.008 (0.156) |
| high education | 0.357 (0.479) | 0.380 (0.486) | 4.571* (0.033) |
| self-employed parents | 0.280 (0.449) | 0.263 (0.440) | 2.857 (0.091) |
| perc. lack of fin. support | 0.740 (0.439) | 0.787 (0.410) | 23.335** (0.000) |
| perc. administr. complex. | 0.697 (0.460) | 0.720 (0.449) | 5.147* (0.023) |
| perc. insufficient info | 0.447 (0.497) | 0.449 (0.497) | 0.016 (0.900) |
| perc. unfav. econ. climate | 0.668 (0.471) | 0.707 (0.455) | 13.327** (0.000) |
| risk tolerance | 0.511 (0.500) | 0.479 (0.500) | 8.213** (0.004) |
| internal locus of control | 0.169 (0.773) | 0.157 (0.747) | 15.959** (0.000) |
| self-employment preference | 0.560 (0.496) | 0.411 (0.492) | 173.731** (0.000) |

** significant at the 0.01 level (two-tailed); * significant at the 0.05-level (two-tailed)

There are several differences between women and men. We see that women in the sample on average are younger; 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.

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

$$(a) Y = a + b_1X + b_2Z + e$$

$$(b) Z = a + bX + e$$

Assume that Y represents self-employment (preference), Z is a selected explanatory variable and X is gender. To calculate the indirect effect of gender on self-employment (preference) we use the Sobel Product of Coefficients: $b_{indirect} = b_2*b$. The significance of this coefficient can be tested using a t -test: $t_{indirect} = b_{indirect}/s_{b_{indirect}}$. To calculate the standard error for the indirect effect, we follow Sobel (1982), proposing the following

formula: $s_b = \sqrt{b^2 s_a^2 + a^2 s_b^2}$, where a and b refer to the unstandardized coefficients of the effects of X on Z and that of Z on Y , and s_a and s_b are the standard errors that belong to the coefficients a and b .³²

The coefficients of the indirect effects as well as their significance are presented in Table 7.

Table 7: Indirect effects of gender 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 | 0.010 | 2.803 | 0.001 | 0.394 |
| self-employment preference | . | . | 0.355 | 11.588 |

We see that there are several indirect effects of gender through the (other) explanatory variables on (preference for) self-employment. Gender (i.e., male) has a negative effect on self-employment preference 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, whereas age has a negative effect on preferences and lack of financial support a positive effect³³. Gender appears to have a positive indirect effect on preferences through perception of an unfavorable climate, risk tolerance, internal locus of control and (to some extent) perception of administrative complexities and self-employed parents. Men tend to be more risk tolerant and have a higher internal locus of control, leading to a higher preference for self-employment. Also, men are less likely than women to feel that there are administrative complexities and that there is an unfavorable economic climate, whereas these perceptions have a negative effect on preferences. Also, men are somewhat more likely to have self-employed parents, positively influencing preferences.

³² Alternative methods for computing the standard error have been proposed by Baron and Kenny (1986) and Goodman (1960). These methods include a squared term of the two standard errors for a and b , which is small when the standard errors are small and the sample size large.

³³ For the interpretation of the positive relationship between perception of a lack of financial support, see Grilo and Thurik (2005a) and the discussion of this effect in previous sections.

We also see from Table 7 that gender (i.e., male) has a positive influence on actual self-employment through self-employment preference, age, perception of administrative complexities and (to a smaller extent) self-employed parents. Indeed, we have found a strong indirect effect of gender through preferences on actual self-employment. Because women have a lower preference for self-employment, they also are characterized by lower self-employment rates. The perception of administrative complexities diminishes the odds that an individual is self-employed, and we see that men are less likely to think that there are administrative complexities. The fact that men are older and are more likely to have self-employed parents may be specific for this sample.

V: “Direct” effects of gender

We have seen that gender moderates the relationship between several of the explanatory variables and self-employment (preference), and also indirectly influences self-employment (preference) by way of the other explanatory variables. However, the results in Table 5 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 analysis³⁴. Indeed, when you control for other factors that are relevant for the self-employment decision, it is likely that the (direct) gender effect diminishes. In other words: there may be factors that are confounded with gender, that influence self-employment (preference), which have not been included in the analysis.

From Table 4 we have seen that the direct effect of gender on *preferences* is larger than that on self-employment *status*. Accordingly, it is important to find out what determines the preference for self-employment of women and men, in an attempt to disentangle the gender effect and present the underlying mechanisms. In the Flash Eurobarometer data set information is available on the reasons why individuals have a preference to become an employee rather than self-employed. Insight into gender differences with respect to these reasons may provide additional insights into why women have a lower preference for self-employment than men, capturing the (positive) direct gender effect.

Gender differences with respect to the reasons to prefer wage-employment over self-employment are presented in Table 8. As compared to men, women are more likely to indicate that wage-employment provides regular income, stability and social security. These factors refer to *willingness* of an individual to become self-employed. Also, women are more likely to indicate that they lack an entrepreneurial idea, time, financial capital, 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.

Unfortunately this information was not available for the respondents in our data set (i.e., for the respondents who indicated that they had a preference for self-employment and/or are self-employed). Future research investigating self-employment preferences (of

³⁴ See Verheul (2005) arguing that the direct gender effect should be considered a residual effect, where not all relevant variables have been accounted for.

women) should consider these factors. Including these factors in the analysis is likely to lower the size of the direct gender effect, i.e., labelling it.

Table 8: Mean differences between women and men with respect to the reasons indicated to prefer wage-employment over self-employment

| Reason | Male (std. error) | Female (std. error) | Chi-square (P-value) |
|------------------------------|----------------------|------------------------|-------------------------|
| regular income | 0.151 (0.358) | 0.211 (0.408) | 47.359** (0.000) |
| stability of employment | 0.127 (0.333) | 0.153 (0.360) | 11.039** (0.001) |
| social security | 0.071 (0.257) | 0.095 (0.294) | 15.435** (0.000) |
| lack of entrepreneurial idea | 0.023 (0.151) | 0.037 (0.188) | 11.849** (0.001) |
| lack of time | 0.036 (0.185) | 0.064 (0.245) | 35.133** (0.000) |
| lack of finance | 0.039 (0.194) | 0.055 (0.228) | 10.736** (0.001) |
| lack of skills | 0.017 (0.131) | 0.034 (0.182) | 22.772** (0.000) |
| lack of knowledge | 0.015 (0.122) | 0.028 (0.164) | 15.407** (0.001) |

5. Discussion and Conclusion

This study has investigated the factors influencing the probability of women and men to be(come) self-employed. Starting from a lower self-employment preference combined with a lower self-employment prevalence rate for women, the present paper sets out to investigate the underlying mechanisms behind these gender differences, distinguishing between different ways in which gender can exert influence on self-employment (preference). Findings show evidence for moderating effects of gender, where gender moderates the relationship between self-employment (preference) and other explanatory variables, as well as indirect effects of gender on self-employment (preference) 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. We do not find a (moderating) 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, they do not differ with respect to the materialization of such a wish. This is interesting as it would indicate that it is *willingness* rather than *ability* that explains the lower self-employment rate of women, and that women do not seem to experience gender-related barriers.

We have to be careful 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 may be persistent and do not refrain from starting a business

in the face of these barriers. Second, the empirical results suggest that there may still be gender-related barriers. For example, we find that because women are more likely to perceive administrative barriers, they are less likely to be self-employed. The higher likelihood of women to perceive administrative complexities hindering new venture creation may be explained in terms of real barriers, where women have negative experiences with administrative procedures that are involved in starting a business. Indeed, administrative procedures may be more of a problem for women than for men as women usually have less entrepreneurial experience. In this respect, the perception of administrative complexities may be an indicator of a (specific) barrier for female entrepreneurship. However, it may also refer to the awareness of women of all administrative procedures that have to be fulfilled before and during start-up. They may be more perceptive and realistic than men on this issue.

In general it may be argued that all perception variables may be interpreted by the respondents in two different ways (that need not be related). They can apply it to the own situation (e.g., where entrepreneurs have personal experiences with administrative barriers) or to the entrepreneurial environment in general within a specific country or region (e.g., where potential entrepreneurs may be discouraged by the existent structures)³⁵. In light of the absence of a moderating 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 administrative procedures – pointing at a gender-specific barrier – or that they simply are more aware of these procedures – creating an awareness barrier.

Third, 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 that are confounded with gender that explain the probability of self-employment. These factors may be related to a lower ability of women to become self-employed. Because of data limitations factors such as industry experience or entrepreneurial experience have not been taken into account in the present study, whereas it is likely that these factors impact the decision to become self-employed. Similarly, the direct gender effect on self-employment preferences, indicating a lower self-employment preference of women, may be explained in terms of willingness or ability. Investigating the reasons for preferring wage-employment over self-employment, we find gender differences with respect to both willingness factors (e.g., stability of income, employment and social security) and ability factors (e.g., lack of idea, time, finance, skills and knowledge). These factors may also be expected to explain the lower preference for self-employment of women. For example, we see that women feel that they lack a suitable business idea, time, money and knowledge to start a business. Although this may reflect a lower entrepreneurial self-perception of women³⁶ (who tend to have less confidence in their own capabilities than men) rather than reality, it still provides a reason for women to prefer wage-employment over self-employment. And it may not only influence preferences but also actual occupational choice.

³⁵ 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”.

³⁶ Verheul et al. (2005) show that women are less likely to perceive of themselves as entrepreneurs, even when controlled for the activities they (have) undertake(n).

Although the present study includes perception variables for 'lack of financial support', and 'lack of sufficient information', these appear to represent the general situation in a country applying to all individuals, rather than referring to the specific individual circumstances. Future research on this topic should make a clear distinction between individual-level factors and factors indicating the entrepreneurial climate in a country. Also, research within this field should aim to 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 choice or barriers that keep women from becoming self-employed. The present study shows that *at least* part of the explanation for 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 stimulating women to become entrepreneurs, should not only focus upon removing barriers, but also on changing preferences and attitudes, for instance by paying more positive attention to entrepreneurship in the media (i.e., in media that target women, including specific television programs and magazines), and making use of female role models. The latter may be of particular importance in the light of the lower entrepreneurial self-perception of women.

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