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Gender differences in self-employment in Finnish regions

Hannu Tervo and Mika Haapanen*
School of Business and Economics, University of Jyväskylä

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Abstract

This paper analyses female and male entrepreneurship and their differences in Finland. Female self-employment rate is clearly lower compared with male self-employment rate in Finland. The paper shows that the reasons that lead women and men to be self-employed are diverging and end in a gap in self-employment rates. The predicted earnings differential between self-employment and paid-employment has a diverging effect on the probabilities of self-employment. For males it is positive and for females negative. The finding of the negative effect for females accentuates their other motives for self-employment. Both the spouse and family are shown to have bigger effects on female self-employment than on male self-employment. Yet personal characteristics are at the bottom of entrepreneurship for both sexes. Regional characteristics are more important for male than female self-employment. In consequence, regional variations in the rate of self-employment are much bigger among men than women in Finland. The analysis is based on a structural probit model and a big register-based data set which represents a 7% random sample of all Finns.

*Contact information: School of Business and Economics, P.O. Box 35, FIN-40014 University of Jyväskylä, Finland. Emails: htervo@econ.jyu.fi and mphaapan@econ.jyu.fi. The paper is a part of a Research Programme on Business Know-how (LIIKE 2, project no 112116) financed by the Academy of Finland. Hannu Tervo also thanks the Yrjö Jahnsson Foundation for financial support.

1. Introduction

In all countries, there are less female than male entrepreneurs, albeit in many countries females represent the fastest growing segment among the self-employed (Parker 2004, Verheul, van Stel and Thurik 2006). The reasons that lead women and men to be self-employed can be very different, and may also differ between regions. Although a growing number of studies has analysed female self-employment and gender differences in self-employment, a drawback of many studies is that they ignore relative earnings as a determinant of female self-employment (cf. Parker 2004).

According to the Knightian utility maximizing paradigm, individuals choose the occupation that offers the greatest expected utility (Knight 1921). Most economic research on self-employment and entrepreneurship is derived from a model of rational worker choosing self-employment if the expected utility exceeds the expected utility of paid-employment. Of the factors that cause the utility flow from self-employment to exceed that from paid-employment, earnings is plausibly one of the most influential. The hypothesis is that the higher the earnings differential between self-employment and paid-employment, the more likely individuals are to become entrepreneurs. Empirical results are, however, inconclusive: relative earnings do not play a clear-cut role in explaining cross-section self-employment choice.¹ Georgellis and Wall (2005) found that women respond differently than men to earnings differentials between paid-employment and self-employment: the differentials were found to be important for men but not for women in Germany.

Besides the influence of earnings, the utility are affected by several individuals' characteristics, their social background, education, and experience as well as environmental factors. Family situation may also be an important factor, especially in the case of females. Primarily due to child-care concerns, men and women may have different occupational strategies.

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Parker (2004) presents a good survey of these results.

For females, entrepreneurship may offer a meaningful career opportunity in which they have better possibilities to combine work and family activities than in wage work (Arenius and Kovalainen 2006). Carr (1996) even argues that a theory of self-employment that applies to women must incorporate family characteristics including marital status, parental status, and ages of children. Several studies show that female and male entrepreneurs also differ in many respects. For example, female entrepreneurs have been found to be more educated (Cowling and Taylor 2001) and older (Devine 1994) than male entrepreneurs. Self-employed females often work in different sectors compared with self-employed males. Self-employed women are less likely to be in high-paying occupations and industries than self-employed men (Devine 1994, Clain 2000). After controlling for differences in some personal characteristics, Moore (1983) nevertheless found that female/male earnings ratios in self-employment were much lower than these ratios in paid-employment. A different result is that women who choose self-employment have personal characteristics that are less highly valued by the market than woman who choose wage- and salary-employment, while the reverse is true for men (Clain 2000).

An important question related to the motives of self-employment concerns the relative strength of pull and push factors. Are individuals pushed or pulled into self-employment? Is it market pull and higher expected earnings which dominate or are individuals pushed into entrepreneurship when nothing else is available? Is there a difference between sexes? Existing research on the “push-pull” debate has not been fully answered, although many studies support the role of push factors (e.g. Storey 1991, Earle and Sakova 2000, Moore and Mueller 2002, Tervo 2006). A recent study from Finland, however, suggests that unemployment is no longer an important route to entrepreneurship (Heinonen et al 2006). Interestingly, sociological theories suggest that low-wage workers are pushed into entrepreneurship, whereas high-wage workers are pulled into entrepreneurship by attractive opportunities (Clain 2000). As women have lower wages than men the theory would suggest that especially women are pushed into self-employment. Indeed, Hughes (2003) argues that push factors have been underestimated in explaining women’s rising self-employment: restructuring and downsizing has eroded the availability of once secure jobs in the public and private sector. The promise of independence, flexibility and opportunities is not that important in this change.

An indication of the relative significance of the push and pull factors can be obtained in the analysis of regional differences in self-employment. A well-known but little understood fact is that rates of entrepreneurship exhibit pronounced and persistent variation across regions. The specification and understanding of regional entrepreneurial environments remains a complex issue (Moyes and Westhead 1990, Reynolds, Storey and Westhead 1994, Malecki 1997, Niittykangas and Tervo 2005). Demand conditions may account for regional variations in entrepreneurship, but push factors may be still more important. If paid-employment opportunities remain low in local labour markets, individuals who would otherwise prefer to work in paid-employment are pushed into establishing their own business ventures.

Figure 1 shows how self-employment rates vary across different type of regions in Finland in 2001. Clearly, the more advanced the region is and the better employment conditions it has the lower is its self-employment rate. While self-employment rate remains as low as 6.2% in the most advanced Helsinki-region, the rate is almost twice as high, 12.0 %, in the sparsely populated rural area where unemployment is high, the rate of employment low and available jobs are scarce. Female self-employment rates compared with male self-employment rates are throughout lower. Regional differences in female rates are not, however, that wide. Accordingly, the finding that self-employment rate tends to increase the more sluggish the labour market is concerns principally males, but is not that apparent in the case of females. Contrary to the sociological theories, this would suggest that the push-element is not strong for females. Compared with women, men are more often forced to support themselves and their families by running a business of their own when nothing else is available.

== Figure 1 ==

This paper analyses female and male entrepreneurship and their differences in Finland. The focus is on the understanding of the role of relative earnings and other factors such as individual characteristics, family situation, spouse's characteristics and family background in the choice between self-employment and paid-employment among females and males. An important aim is also to analyse the role of environment on occupational choice and earnings. The effect of these and other factors on female and male self-employment is analysed using structural probit model. Its application to female as well as to male self-employment would shed light on gender

differences in that how relative financial returns in each occupation and the other factors affect occupational choice in Finland. Our analysis is based on a rich data set taken from various registers kept by Statistics Finland. The data set represents a 7% random sample of all Finns from the year 2001. It includes a lot of information on individuals, their families and parents, their jobs, dwellings and incomes and the regions they are residing. Due to its nature, the data are very reliable. For example, the measurement of income which is based on the tax files of the National Board of Inland offers an excellent starting point for the analysis of relative earnings differential.

The rest of the paper is organized as follows. Model is presented in Section 2 and data and variables are described in Section 3. Estimation results are presented in Section 4. Finally, concluding remarks bring the paper to an end.

2. Model

Since the pioneering work of Rees and Shah (1986), the structural probit model has become a popular method in the analysis of the role of relative income and other factors in the choice between paid- and self-employment (e.g. Dolton and Makepeace 1990, Taylor 1996, Johansson 2000, Georgellis and Wall 2005, Leung 2006, Hammarstedt 2006). This is a three stage process, the first being to estimate the reduced form probit equation which is the selector equation. In the second stage, occupation specific and selectivity-corrected earnings equations are estimated, which are used to predict income in each occupation. The final step is to estimate the structural probit using the difference in predicted income as well as other explanatory variables. This is the structural form selector equation. An advantage of the model is that it takes into account possible selection effects due to endogenous occupational incomes. In this way, the direct effect of individual, familial, environmental and other characteristics on self-employment choice can be distinguished from the indirect effect of these characteristics through expected earnings.

According to the model, an individual chooses to work in paid-employment or to be self-employed. The selection of occupation is based on the comparison of utilities. The individual will become self-employed if the resulting utility exceeds the utility gained from paid-employment. The utility is affected by the individual' background, family situation, local labour

market characteristics as well as the earnings (s)he expects to obtain in each occupation. An individual will choose to be self-employed if:

$$(1) \quad U_{iSE} - U_{iE} = a (\ln Y_{iSE} - \ln Y_{iE}) + bX_i + e_i > 0$$

where U represents the utility that an individual can expect to receive from self-employment (SE) and paid-employment (E) respectively and on the right-hand side the first term is the difference between the logarithms of earnings Y in the two occupations, X is a vector on individual and other characteristics that influence the individual's choice between self-employment and paid-employment, a and b are parameters or vectors of parameters to be estimated and e is a random error term.

Equation (1) can be estimated as a probit model in which an individual will choose self-employment if:

$$(2) \quad \text{prob} (U_{iSE} - U_{iE} > 0) = \text{prob} [a (\ln Y_{iSE} - \ln Y_{iE}) + bX_i + e_i > 0]$$

and

$$(3) \quad e_i \sim N(0, \delta^2)$$

To estimate this model, the difference in the earnings variable is needed. Selectivity-corrected earnings functions are estimated separately for the self-employed and employees. By using the Heckman approach, we estimate the equations:

$$(4) \quad Z_i = cW_i + v_i$$

$$(5) \quad \ln Y_{iSE} = d_{SE} M_i + f_{SE} \lambda_{iSE} + u_i$$

$$(6) \quad \ln Y_{iE} = d_E M_i + f_E \lambda_{iE} + u_i$$

where Z is an indicator variable equalling 1 if individual i is self-employed and 0 otherwise, W is a vector of characteristics that influence an individual's choice between self-employment and paid-employment, M ($\neq X$) is a vector of variables influencing earnings, and λ_{iSE} and λ_{iE} are the Inverse Mills Ratios to correct for selectivity in each occupation. Equation (4) is called the reduced form probit. Mincer-type earning equations (5) and (6) are used to predict the earnings from self-employment and paid-employment respectively. These are used in the estimation of the structural probit equation (2).

For identification purposes, variables that appear in the structural probit but not in the earnings equations should be variables that affect the self-employment decision but not earnings. Furthermore, variables that appear in the earnings equations but not in the structural probit equations should be variables that affect only earnings but not the choice to become self-employed. The results may be sensitive to the choice of exclusion restrictions (cf. Johansson 2000). This is due to multicollinearity problems easily related to the estimation of the structural form probit. This equation includes the predicted earnings differential as well as other explanatory variables part of which are also used to determine the differential variable. Thus, robustness checks where the restrictions are altered are important in the estimation process.

As the main aim of this paper is to analyse female self-employment and to compare gender differences in self-employment the structural probit model has been estimated separately for women and men. Most empirical studies focus on men's self-employment decisions and there is a distinct lack of comparable work that examines the self-employment decisions of women, especially work which also analyses the role of expected earnings (see, however, ⁵ and Wall 2004, Leung 2006). A number of studies have pooled data in men and women, using only a dummy variable to capture gender differences. This is not sufficient, since the effects of many factors such as family and relative self-employment earnings may differ between females and males. In addition to separate estimations, we also employed pooled estimation where we used interaction variables to compare the estimated equations between females and males. In these pooled estimations, to test whether an effect observed for any explanatory variable depends on gender, each explanatory variable is interacted with the gender dummy and included in the equations.

3. Data and variables

3.1 Data

The data used in the analysis are based on various registers kept by Statistics Finland. We have in use a 7 percent random sample of those individuals who resided permanently in Finland in 2001. By using the personal identifier, data from various sources have been merged. In addition, data on spouses and parents have also been merged under every individual.² As a result, the data set includes numerous variables from the Longitudinal Census File, Longitudinal Employment Statistics and other registers from the period 1970-2002. In the present cross-sectional analysis, the occupational choice in 2001 is investigated.

The analysis is directed at the population of working age, 18-64 years, who were employed either in paid-employment or in self-employment in 2001. Those working in the agricultural sector (NACE rev. 1, Class A 01) are removed³. Their number is 5 094. The size of the working sample is 146 878 of which 72 243 are women and 74 635 are men. The number of self-employed is 11 334 of which 3 764 are female and 7 579 are male. Compared with the initial sample, the size of which is 149 238, the number of observations is slightly reduced because certain variables used in the analysis have missing values and some individuals had no income in 2001.

3.2 Dependent variables

The dependent variable in the occupational choice (reduced form and structural probits) is a binary variable, equalling 1 if the individual is self-employed and 0 if (s)he is wage-worker (see Table 1). This piece of information is based on the definitions used by Statistics Finland

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The data set has been ordered from Statistics Finland where the compilation has also been done. Due to data protection legislation, Statistics Finland does not give information on the basis of which individuals could be identified.

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Most self-employment analyses exclude agricultural workers. The concept of self-employment is vaguer in agriculture than in other industries, and farm businesses have very different characteristics from non-farm businesses (Blanchflower 2000, Parker 2004).

(Statistics Finland 2001). Self-employed (entrepreneurs) are defined as individuals of working age who during the last week of the year 2001 had a self-employed's pension insurance (YEL) and are not unemployed or doing their military or non-military service. Accordingly, having a self-employed's pension insurance is the main criterion. This is required if self-employment has continued at least for four months and entrepreneurial income exceeds a limit which is specified yearly. If an individual is also in an employment relationship, it is required that her/his entrepreneurial income exceeds wage income. The category of entrepreneurs also comprises unpaid family members (who are not wage-earners). In the data, the number of self-employed is 3 764 among females and 7 579 among males. The self-employment rates are 5.2% and 10.2%, respectively. Accordingly, the rate for males is nearly twice as high as it is for females.

== Table 1 ==

The measure of income is based on the tax files of the National Board of Inland Revenue concerning income subject to state taxation in 2001. Hence, the measure of income is both more accurate and more reliable than measures used in studies based on interviews. Income under-reporting by the self-employed is a typical problem of many previous studies (cf. Parker 2004). Our income measure is the difference in logarithms between the annual income subject to state taxation and three types of transfer payments, viz. unemployment benefits, daily allowance and maternity allowance and home care allowance. Income subject to state taxation includes both wage income and entrepreneurial income as well as social security benefits.⁴

The average of the logarithmic income is smaller among the self-employed compared with the wage-workers. This concerns both females and males. Earnings are clearly higher for males than females. Table 2 shows the distribution of unlogarithmic earnings by gender and occupational status. With this measure, the average income is even higher among self-employed than wage-workers. Table 2 shows that the earnings distributions between wage-workers and self-employed are rather different. The earnings of the self-employed have a noticeably greater variation in absolute and relative terms and are, thus, more widely spread. Self-employment

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Due to data protection legislation, the highest percentile in the income subject to state taxation is given as a mean in the data. This, however, has no big effects on the results.

typically offers higher earnings but the increased chances of this are balanced by the increased chances of low earnings. The variation between the earnings in self-employment and wage-work is greater among females than males. Even a quarter of the female self-employed earned less than 8 000 € in 2001, but 10% earned more than 45 000 €, while the shares among the wage-workers are 11% and 3%, respectively.

== Table 2 ==

3.3 Explanatory variables

We use in the analysis several explanatory variables which are broadly categorized into six groups. These describe personal characteristics, family characteristics, spouse's characteristics, parents' characteristics, house property and regional characteristics (Table 1). To our knowledge, no previous study has employed such an exhaustive number of variables.

Personal characteristics

Personal characteristics include age, work experience, mother tongue, and field and level of education. Age and work experience are usually expected to be important both for the choice of occupation and the earnings (Parker 2004). The effect of age may be non-linear, for which reason both age and age squared are included. Language differentiates the natives from a tiny minority of ethnic immigrants, on the one hand, and the Swedish-speaking minority from the Finnish-speaking majority, on the other hand. Entrepreneurship is often the only possibility for immigrants, for which reason they are likelier than natives to be self-employed (Parker 2004). The level of immigration is not, however, very high in Finland. Finland is a bilingual country where Finnish is the dominant language, but Swedish is the first language of a significant part of the population mainly along the southern and western coastlines. Institutional support for the Swedish-speaking minority has traditionally been strong (Liebkind, Broo and Finnäs 1995). The Swedish-speaking community with its shared language, culture and social capital may affect the occupational choice. The field of education reveals the educational orientation the individual has. Six dummy variables are used to determine the most important fields of education. In addition, three dummy variables are used to describe the level of education. Differently from the

previous studies, the highest level of education has been divided into lower-level and higher-level tertiary education. Finnish results (e.g. Johansson 2000, Niittykangas and Tervo 2005) suggest that individuals with a higher level of education have a lower probability of being self-employed. In Finland, more women than men are entering higher education. Education increases both an individual's human capital and her/his earnings capacity in paid-employment.

In addition, three variables are used to describe an individual's creativity. To our knowledge, these variables have not been used in previous analyses of self-employment. The Schumpeterian entrepreneur is the prime mover in economic development, and her/his function is to innovate (Casson 2003). Schumpeter (1934) views the entrepreneur as a rare, unusual creature driven by instinctual motives. Lucas (1978) stated that more able individuals become entrepreneurs and the rest become workers. This leads to an expectation that the more creative an individual is the more likely (s)he will become entrepreneur. On the other hand, knowing that individuals who would otherwise prefer to work in paid-employment are frequently pushed into self-employment, especially if paid-employment opportunities for them remain low, creativity is not inevitably a very pertinent determinant of entrepreneurship. The creativity variables are based on Florida's (2002) definition on the creative class which is defined according to occupational data. These people are not necessarily highly educated but are working in creative, innovative jobs. Creative core includes occupations such as physicists, architects, life science professionals and teaching professionals, creative professionals include occupations such as managers, matrons, ward sisters, legal professionals and trade brokers and bohemians include occupations such as writers, creative and performing artists and photographers.

Family characteristics

Especially related to female entrepreneurship, family characteristics are important to take into consideration in the analysis of the choice between paid- and self-employment. Family support may be assumed to help self-employed individuals in running the business. Family characteristics may also represent constraint for the choice between self- and paid-employment. Especially for women, self-employment may be a flexible strategy to accommodate the competing demands of family and work (Carr 1996). On the other hand, married people with children may be unwilling to take risks associated with entrepreneurship. Our family variables

describe comprehensively the family situation, marital status and children the individual has. Two variables describe whether the individual is married or cohabiting and still one variable reveals whether (s)he is a single parent. Four variables describe children in the family. In addition to a variable measuring the number of children, two dummy variables differentiate those families who have younger than 7 or 3 years old children. Women with young children may opt for self-employment because of its flexibility and autonomy, provided they have other resources to facilitate the starting of their own businesses. On the other hand, the availability of public child care is good in Finland and its usage is also very frequent. Finally, a dummy differentiates from others those cohabitee couples who have children which are not common.

Spouse's characteristics

Like family characteristics, spouse's characteristics may be important especially for females. Intra-household influences such as the type of employment of one's spouse may also affect an individual's observed type of employment (Brown, Farrel and Sessions 2006). Having a working spouse enhances the probability of self-employment (Blanchflower and Oswald 1990, Bernhardt 1994). A spouse can help in many ways in the starting phase of the business as well as in its running phase. Our variables describe spouse's activity, field and level of education and income. A potentially important variable is the one which determines whether a spouse is self-employed or not. Typically, those individuals who have self-employed spouses have higher self-employment rates. Marriage may be a sorting mechanism with respect to self-employment potential, self-employed couple might be operating family business or the presence of a self-employed spouse may enable intra-family flows of financial or human capital, thereby easing an individual's transition into self-employment (Bruce 1999). The phenomenon of "assortative mating" may also offer an explanation on the similarity of employment status within couples (Brown et al. 2006). The other dummies describing spouse's activity determine whether an individual is a wage-earner, student, retired or unemployed. The education variables are similar to the variables presented above. Finally, a variable describes spouse's financial situation which is measured by her/his wage income.

Parents' characteristics

Family background may account for the choice between self- and paid-employment. Intergenerational transmission in self-employment has been shown to be an intense phenomenon (e.g. Lentz and Laband 1990, Laferrère and McEntee 1995, Niittykangas and Tervo 2005). Children from self-employed families are more likely to perceive such a career as being more acceptable than working for someone else. They possess a kind of entrepreneurial human capital or cultural inheritance, as they have been able to observe their self-employed parents in their childhood and youth. They may also have gained practical business experience by working in the business. In addition, family background may provide self-confidence and social support. For Finland, Niittykangas and Tervo (2005) showed that many sons in self-employed families continue in their parent's footsteps, while daughters in these families do not enter business that often. In addition to this gender difference, the data enable us to investigate whether there are differences between the impact father and mother has: we have two dummies which describe both father's and mother's self-employment history. Dunn and Holtz-Eakin (2000) found that having either parent self-employed has a strong positive effect on the probability of men's self-employment. They also found that the probability of a son becoming self-employed is higher if his father rather than his mother is self-employed. They do not, however, consider female self-employment. In addition to these family background variables, we also have dummies which measure both father's and mother's educational level.

House property

Many studies show that the probability of self-employment increases with the individual's net worth (e.g. Evans and Jovanovic 1989, Evans and Leighton 1989). Entrepreneurial activity is restricted by liquidity constraints. Two variables measure household wealth. The first shows whether an individual is an owner-occupier of a house or a flat, and the second whether (s)he also owns a summer cottage.

Regional characteristics

Regions typically differ with regard to entrepreneurship, including the case of Finland (see Figure 1 above). An individual's region of residence may be a significant determinant of both earnings and the choice between self- and paid-employment. In the analysis, we use five dummies to denote an individual's type of sub-region of residence. This categorization is based on a comparatively new regional classification created in Statistics Finland (see Kuntaliitto 2005, appendix 2). A sub-region consists of several municipalities and they represent local labour market areas reasonably well. Their number is altogether 82, of which 4 belongs to the metropolitan region, 7 are classified as many-sided university regions, 14 as regional centres, 12 as industrial centres, 28 as rural sub-regions and the rest, 17, are classified as sparsely-populated sub-regions. Besides this categorization, a dummy is used to differentiate whether an individual's dwelling place is urban or scattered settlement. Each sub-region has both type of settlements - even the metropolitan region have scattered settlements as well as sparsely-populated sub-regions have urban settlements.

In addition to these dummies, three complementary variables describing regional characteristics are used. First, it is important to differentiate between the individuals who are residing in their regions of birth from those who are not. Second, we measure the size structure of enterprises in the sub-region. Several studies have indicated a strong positive relationship between business formation rates and the share of small firms in regions (e.g. Reynolds et al. 1994, Armington and Acs 2002; in Finland Niittykangas et al. 1994). The seedbed hypothesis assumes that the main determinant of self-employment is the local industrial structure, through spin-off effects. Not all places are alike in their potential to generate entrepreneurship partly because the possibilities for entrepreneurial learning process differ between regions (Tervo and Niittykangas 1994). Role models are also important here. Regions with strong traditions of entrepreneurship may be able to perpetuate them over time and across generations (Parker 2004). Those individuals who have experience in small firms, either as workers or as members of an entrepreneur family, will be more likely to set up in business than other individuals (Storey 1994). Third, we measure the rate of employment in the sub-region. Demand conditions may also account for regional variations in entrepreneurship. If employment opportunities remain low in local labour markets,

individuals who would otherwise prefer to work in paid-employment are pushed into establishing their own business ventures.

4. Estimation results

As discussed above, the econometric analysis has three separate components: a reduced-form probit model of the choice between self-and paid-employment, selectivity-corrected earnings equations for the self-employed and wage-workers, and a structural probit model that takes account of the expected earnings differential. The main role of the reduced-form probit model is to obtain estimates of the selectivity terms, for which reason these results are provided in Appendix. Estimated earning equations are presented in Table 3 and the results of the structural probit estimations in Table 4.

4.1 Earning equations

The earnings equations include the variables that describe personal and regional characteristics. For identification purposes, we need to leave out the variables which presumably have no effects on earnings, but affect the self-employment decision. Characteristics related to one's family, spouse, parents and house property have been left out from the earnings equation.

== Table 3 ==

As expected, work experience and schooling proved to be important determinants for earnings. The results suggest that the self-employed rate of return to educational attainment is also remarkable. All estimated equations show a non-linear relationship between earnings and age, although the earnings-age profiles differ between the self-employed and wage earners. Field of education has not a very strong effect, although also here is variation. In the case of paid-employment, earnings are higher if male's field of education is technology, health, welfare or services. In self-employment, agricultural education lowers earnings for both sexes. For female self-employed, the estimated coefficients on all the dummies for the field of education are negative suggesting that the reference category, general education (or having no spouse) is most remunerative. The language dummies show, first, that individuals who speak other than

Finland's official languages, Finnish or Swedish, as their mother tongue, i.e. immigrants, have lower earnings than natives, and second, that the effect of the Swedish-dummy depends on the case. Swedish-speaking male entrepreneurs earn less than Finnish-speaking male entrepreneurs. The same concerns Swedish-speaking female wage earners, whereas the estimated effect of this language dummy is positive, though insignificant, in the other two cases. The creativity-variables reach positive and significant coefficients which suggests that individuals working in these occupations earn more than others. The exception are male self-employed if they are working in "bohemian occupations".

Regional features seem to affect earnings. Both self-employed and wage earners residing in sub-regions dominated by large-scale enterprises or in regions with high employment rates earn more than individuals residing in opposite-type sub-regions. For female self-employed, these effects are not, however, statistically significant, albeit of the right sign. Similarly, individuals residing in urban settlements earn more than individuals residing in scattered settlements. This result is statistically significant in all the four cases. Whether or not an individual has moved out of the region of birth has not significance, except for male wage earners for whom the estimated effect is negative. After controlling for these regional features as well as all individual characteristics, the type of sub-region has still some significance for earnings, although the estimated coefficients on these regional dummies are not very big.

It is interesting to analyse more thoroughly differences between the earning equations estimated for males and females. Table 3 shows indicatively the statistically significant differences. The testing results are based on pooled estimations which included the interaction variables in which each variable was multiplied by the gender dummy. The results show that the earnings equations between females and males differ from each other. In the case of the wage earners, most of the observed gender differences are significant. Related to work experience, certain fields of education and creativity (CREAPROF), the dissimilarities are even rather big. Due to smaller number of observations, the observed differences among the self-employed are not that often significant. Rates of return to higher education or to being "a creative professional" are higher for female than male entrepreneurs. Being a Swedish-speaking self-employed rewards females more than males. On the contrary, the return to technical education is higher for male than

female self-employed. In addition, the type of sub-region has a different effect on the earnings between self-employed males and females.

The sample selection term, Mills lambda which corrects possible selection bias has a significant negative coefficient in three cases out of four. Only in the case of male wage earners, we can find a positive selection effect. In general, there is disagreement about the direction and significance of sample selection effects (cf. Parker 2004). There is no clear-cut evidence that the self-employed select into self-employment because they enjoy a comparative earnings advantage there: a self-employed individual does not inevitably have higher expected earnings than a wage earner with the same characteristics. Our evidence for both females and males also suggests that the self-employed would earn more if they were wage earners. This may reflect that many non-pecuniary benefits of entrepreneurship are more important for the self-employed compared with pecuniary benefits (cf. Hamilton 2000, Kauhanen 2004). On the other hand, this may also reflect the importance of the push effect in self-employment in many Finnish regions. We will come back to this later.

Structural probits

Using the estimated earnings functions, the predicted earnings differential between self- and paid-employment can be determined for both females and males and used in estimation of the structural probits. In addition to the predicted earnings differential variables, the structural probit equations include all variables from our six categories which describe characteristics related to the individual and her/his family, spouse, parents, house property and residential area. The exception are two dummies describing work experience which have been left to avoid a collinearity problem. In consequence, work experience affects the probability of self-employment only through earnings. Estimated coefficients as well as marginal effects for both females and males are presented in Table 4. The Table also includes suggestive information on that which differences between females and males are statistically significant. This information is again based on pooled estimation with the interaction variables.

== Table 4 ==

Most of the variables describing personal characteristics prove to be important in the structural probit (Table 4). Age has a non-linear effect on the probability of being self-employed. If an individual does not speak Finnish as her/his mother tongue, the probability for self-employment increases. Especially for males being an immigrant - native language other than Finnish or Swedish - increases this probability: the estimated marginal effect is as high as 8.9%. The effects of the field of education are opposite between females and males. Only educational and humanistic education (EDUOTHER) has an effect of the same sign (negative), but still the difference between the coefficients is statistically significant, the depressive effect being stronger among males. Business and health education has a remarkable effect for males: the probability of being self-employed increases as much as 8.1% if a male's field of education is health or welfare and 3.1% if it is business or social sciences. For females, the equivalent marginal effects are - 0.8% and -0.7%. The results on the level of education confirm earlier Finnish results according to which individuals with a high level of education have low probabilities of being self-employed. Interestingly, females and males differ in this. If a male has a higher-degree tertiary level education or a doctorate, his probability of being self-employed decreases -6.1%, but for a female the estimated marginal effect is slightly positive, +0.6% (although insignificant). The difference between the estimated effects is, however, significant. Working in creative jobs seems to be related with self-employment which finding supports the Schumpeterian idea of an innovative entrepreneur. If an individual is "a creative professional", as defined by Richard Florida (2002), the probability of self-employment increases, 3.7% for males and 2.4% for females. Being "a bohemian" also increases the probability, as much as 5.2% for males and 3.4% for females. Belonging to "a creative core" has, however, a dissimilar effect: for females the estimated coefficient is insignificant and for males it is significantly negative.

Being married increases the probability of self-employment for both sexes, but having a cohabitation without marriage decreases it. If an individual is a single parent, her/his probabilities for self-employment decrease. For females, the effect is stronger, the marginal effect being -1.6%. An important finding is, however, that children do not have statistically significant effects on a parent's probability of self-employment. A curiosity is that the probability nevertheless increases if a male is married or cohabiting with a spouse who has children of her own. For females, the coefficients on the dummies separating those families who

have young children in the family from the others are yet positive, but not significant. Consequently, we do not obtain solid support for the hypothesis that females who have children under school age would use self-employment for accommodating the competing demands of family and work (Carr 1996). Finnish women resort to public child care which is available for everyone.

If an individual has a self-employed spouse, her/his probability of also being self-employed increases markedly. Interestingly, the size of the effect deviates: for males the marginal effect is 16.9%, while for females it is “only” 4.5%. Accordingly, if a husband is self-employed, in many cases his wife is also in business as an entrepreneur or as an unpaid family member, but the reverse does not take place that often. For both sexes, the probability of self-employment decreases if a spouse is a wage earner, student, retired or unemployed. The field of education which a wife has does not affect a husband’s probability of self-employment, while the field of education which a husband has matters more: if a husband has a technical or agricultural education, a wife’s probability of being self-employed decreases. The results are, however, somewhat controversial, since the differences between the estimated coefficients on males’ and females’ variables are not quite statistically significant. Instead, the diverging effects which a spouse’s degree of education have are more definitive. For males effects cannot be found, while for females the probability of being self-employed increases the higher educated husband she has. If a husband has an academic education, a wife’s probability of self-employment increases as much as 2.9%. The income the spouse has does not affect one’s probability of being self-employed.

Family background seems to have significance for both sexes. If an individual is from a self-employed family, her/his probability of self-employment increases markedly. For boys this effect is, however, stronger than for girls. This result corresponds with earlier Finnish results (Tervo and Niittykangas 2004). A new interesting result is that a father’s effect is greater than a mother’s for sons, while the reverse is true for daughters. An interesting result is also that parents’ educational background does not have a statistically significant effect on boys’ probabilities of self-employment, while for girls some effect can be found. Especially, if a father has a higher education, a daughter’s probability of being self-employed increases.

House property has influence on both sexes, but the effect is greater for males. The probability of being self-employed increases 3.0%, if a male is an owner of both a house (or a flat) and a summer cottage. For females this has not a statistically significant effect, but having an owner-occupied house or flat has, the marginal effect being 0.9%.

Interestingly, regional features have only a small effect on females' self-employment, whereas they matter more for males. As expected, the probability of self-employment increases for both sexes if environment is dominated by small enterprises: the estimated coefficients on the dummy measuring the average size of enterprises in the sub-region are negative. The variable measuring employment rate in the sub-region has no significance. Thus, contrary to the expectations, local labour market conditions do not seem to have effect on self-employment. There may, however, be collinearity between this and other regional variables which is making this result. If a male is residing in a scattered settlement, his probability of being self-employed increases 4.0%, while for females this has no significance. Furthermore, the region-dummies suggest that males' probabilities for self-employment are the lower the more advanced the sub-region is, while for females these dummies do not obtain significance. Finally, if a male resides in his region of birth, his probability of self-employment increases, whereas for females this has no significance. Obviously, men perceive self-employment as an alternative for out-migration, if wage work is scarce in their region, while women more likely leave the region.

Lastly, the coefficient of the earnings differential is positive for males and negative for females. Accordingly, a rise in a male's predicted earnings as a self-employed relative to his earnings as a wage earner will increase his probability of being self-employed, while for females the rise will lower the probability. For males the result is as expected, although the size of the effect remains lower than expected. The marginal effect is yet 3.7%: a unit increase in the log differential is estimated to increase the self-employment rate by nearly four percentage points when calculated at the sample means. For females the estimated negative effect as such is not surprising. Georgellis and Wall (2005) found that the predicted earnings differential is not significant for females, while Leung (2006) found that it is more important for males than females. Our finding of the negative effect emphasizes the hypothesis that many non-pecuniary benefits compared with pecuniary benefits might be more important for female self-employed. The finding also corresponds with our finding of the negative sample selection term in the

estimation of the earnings equation. Individuals may turn to self-employment if they have no other choices. Lower or nil earnings in paid-employment reduce the opportunity cost of self-employment thus pushing individuals into self-employment, especially if they can reconcile their other aims related to working life, as might be the case for females.

To summarize, our results indicate much variation between females and males in that how various characteristics affect self-employment, although many variables behave alike. In Table 5, the maximum and minimum effects of each category of variables on the probabilities of self-employment are presented. Related to each category, the most favourable and unfavourable situations for self-employment are searched for and the probabilities for self-employment in these cases are calculated, when the rest of the variables are kept at their means. We also calculated the range between these probabilities and divided the range by the average probability of being self-employed to take into account the fact that females have a half lower probability of being self-employed compared to males.⁵ The calculations show that personal characteristics is the most important category for both males and females. In the most favourable situation for self-employment, a male's probability of being self-employed is as high as 0.58 and a female's probability 0.22, while in the most unfavourable situation these probabilities are close to nil. A spouse's and parents' characteristics are also important, but family characteristics do not affect that much. It is, however, important to detect that the relative significance of both family's and spouse's characteristics is bigger for a female self-employed than for a male self-employed. Another interesting finding confirms our earlier finding that regional characteristics do not have such importance for female self-employment than they do have for male self-employment.

== Table 5 ==

There are many differences between males and females both in their coefficients of the structural probit equations and in their average values of the variables. The gap between females and males in the probabilities for self-employment may be due to divergent effects the various characteristics have on the incidence of self-employment or due to differences in the average values of these characteristics. To analyse this, we calculated hypothetical probabilities of self-

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This statistic is comparable to the coefficient of variation in which the standard deviation is divided by the mean.

employment for both females and males in different cases (Table 6). When the coefficients from the male structural probit equation are used for females we obtain the probability of 0.119 which is even bigger than the average predicted probability for males, 0.102. Again, when the coefficients from the female equation are used for males we obtain the probability of 0.057 which is quite close to the average probability for females, 0.052. In consequence, these results would suggest that the gap in self-employment rates between females and males is rather due to differing behaviours than to differing characteristics of males and females.

== Table 6 ==

5. Conclusions

The paper gives much evidence on differing behaviour of female and male workers. Female self-employment rate is clearly lower compared with male self-employment rate in Finland. The reasons that lead women and men to be self-employed are diverging and end in a gap in self-employment rates. We pay attention especially to the three following points.

First, the predicted earnings differential has a diverging effect on the probabilities of self-employment for females and males. A rise in a male's predicted earnings as a self-employed relative to his earnings as a wage earner will increase the probability of being self-employed, while for females the rise will lower the probability. The finding of the negative effect for females accentuates their other motives for self-employment. Both the spouse and the family have relatively bigger effects on female self-employment than on male self-employment. Yet personal characteristics are at the bottom of entrepreneurship for females as well they are for males.

Second, the environment in which an individual is residing has less effect on females' inclinations to be self-employed than on males' inclinations. In consequence, regional variations in the rate of self-employment are much bigger among men than women in Finland. Obviously, the push factor is stronger among men than women: the worse chances for paid-employment the region has the higher is its male self-employment rate, while the relationship is not that apparent for females. It should be, however, noted that the finding of the role which the push factor has

in entrepreneurship in Finland is emphasized in an overall analysis of self-employment like this. If we analysed e.g. knowledge-based entrepreneurship, the role of pull factors would become more important.

Third, role models affect strongly entrepreneurial behaviour. We had three kinds of variables measuring the effect which role models have for self-employment: parents' entrepreneurship, a spouse's entrepreneurship and the size structure of enterprises in the sub-region (indicating the role which small firms and entrepreneurial tradition have in the region). All of these variables proved to be very important for the inclination of self-employment. They have a considerable impact for female self-employment, even if their impact on male self-employment is still much greater. Role models are especially important for male entrepreneurship.

Entrepreneurship opens up possibilities for both sexes, but yet self-employment is a much more important option for males than for females in Finland. Female entrepreneurship has been underlined more and more in general discussion - increasing female entrepreneurial activity increases both overall entrepreneurial activity and women's employment situation. Although it is difficult to place behavioural interpretations on cross-section estimates of self-employment selections and earnings, it seems evident that the push factor has a minor role for females than for males, and obviously the role of the pull factor is also smaller. Differing behaviour accounts for differing rates of self-employment between females and males.

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Table 1 . Descriptions of variables and their means

Variable	Description	Mean			
		Females		Males	
		E	SE	E	SE
<i>Dependent variable in probit equations</i>					
Self-empl	1 if self-employed in 2001, 0 if wage-worker	0	1	0	1
<i>Dependent variable in the earnings equation</i>					
Logincome	ln (income subject to state taxation - unemployment benefit - daily allowance and maternity allowance - home care allowance)	9.78	9.51	10.14	9.94
<i>Personal characteristics</i>					
Age	Age in years	40.7	45.1	39.7	45.2
Age2	Age squared divided by 100	17.9	21.3	17.1	21.4
<i>Work experience (reference category: work experience less than 5 years in 1987-2000)</i>					
Workexp1	1 if work experience 5-10 years, 0 otherwise	0.228	0.236	0.228	0.166
Workexp2	1 if work experience more than 10 years, 0 otherwise	0.580	0.684	0.582	0.787
<i>Mother language (reference category Finnish)</i>					
Swedish	1 if native language is Swedish, 0 otherwise	0.055	0.056	0.057	0.074
Otherlan	1 if native language other than Finnish or Swedish, 0 otherwise	0.012	0.013	0.015	0.020
<i>Field of education (reference category: general education)</i>					
Edutrade	1 if field of education business or social sciences, 0 otherwise	0.223	0.178	0.099	0.109
Edutechn	1 if field of education technology or natural sciences, 0 otherwise	0.086	0.082	0.453	0.390
Eduagric	1 if field of education agriculture or forestry, 0 otherwise	0.015	0.019	0.034	0.043
Eduhesoc	1 if field of education health or welfare, 0 otherwise	0.193	0.142	0.023	0.034
Eduservi	1 if field of education services, 0 otherwise	0.127	0.246	0.058	0.034
Eduother	1 if field of education teacher education, educational science, humanities, arts or not known or unspecified, 0 otherwise	0.086	0.051	0.040	0.020
<i>Level of education (reference category: primary education)</i>					
Interedu	1 if secondary education, 0 otherwise	0.413	0.469	0.461	0.425
Lohigedu	1 if lowest level tertiary education or lower-degree level tertiary education, 0 otherwise	0.300	0.210	0.217	0.195
Hihigedu	1 if higher-degree level tertiary education or doctorate or equivalent level tertiary, 0 otherwise	0.101	0.085	0.104	0.056
<i>Creativity (reference category: other than "creative occupation", see Florida 2002 or van Andersen et al 2006)</i>					
Creacore	1 if occupation is counted among "creative core", 0 otherwise	0.121	0.083	0.127	0.064
Creaprof	1 if occupation is counted among "creative professionals", 0 if otherwise	0.206	0.273	0.204	0.273
Creabohe	1 if occupation is counted among "bohemians", 0 otherwise	0.011	0.020	0.014	0.017
<i>Family characteristics</i>					
Marri	1 if married or cohabiting, 0 otherwise	0.772	0.864	0.701	0.815
Cohabit	1 if cohabiting, 0 otherwise	0.179	0.126	0.189	0.152
Oneparen	1 if one-parent family, 0 otherwise	0.097	0.084	0.041	0.037
Childnum	Number of children in the family	0.96	1.06	0.99	1.11
Chilyou7	1 if youngest child in the family less than 7 years old, 0 otherwise	0.175	0.163	0.200	0.180
Chilyou3	1 if youngest child in the family less than 3 years old, 0 otherwise	0.075	0.069	0.107	0.087
Chilnoco	1 if the cohabitee couple has no-common children, 0 otherwise	0.052	0.044	0.063	0.068
<i>Spouse's characteristics</i>					
<i>Activity (reference category: spouse not working or no spouse)</i>					
Spouentr	1 if self-employed, 0 otherwise	0.066	0.263	0.026	0.154
Spouwagw	1 if wage-worker, 0 otherwise	0.505	0.395	0.510	0.486
Spoustud	1 if student, 0 otherwise	0.011	0.004	0.029	0.016

Spoupens	1 if retired, 0 otherwise	0.056	0.075	0.025	0.034
Spouunem	1 if unemployed, 0 otherwise	0.037	0.029	0.048	0.049
<i>Field of education (reference category: general education or no spouse)</i>					
Sedutrade	1 if field of education business or social sciences, 0 otherwise	0.070	0.097	0.154	0.180
Sedutechn	1 if field of education technology or natural sciences, 0 otherwise	0.303	0.303	0.064	0.065
Seduagric	1 if field of education agriculture or forestry, 0 otherwise	0.028	0.039	0.011	0.015
Seduhesoc	1 if field of education health or welfare, 0 otherwise	0.016	0.024	0.135	0.146
Seduservi	1 if field of education services, 0 otherwise	0.038	0.044	0.094	0.111
Seduother	1 if field of education teacher education, educational science, humanities, arts or not known or unspecified, 0 otherwise	0.030	0.034	0.060	0.055
<i>Level of education (reference category: primary education)</i>					
Sinteredu	1 if secondary education, 0 otherwise	0.287	0.304	0.281	0.331
Slohigedu	1 if lowest level tertiary education or lower-degree level tertiary education, 0 otherwise	0.161	0.188	0.213	0.223
Shihigedu	1 if higher-degree level tertiary education or doctorate or equivalent level tertiary, 0 otherwise	0.074	0.079	0.070	0.054
Spouinco	Wage income, 100 €	175.3	157.0	112.7	114.7
Parents' characteristics					
Entrfat	1 if father was self-employed in 1970, 1980 or 1990, 0 otherwise	0.091	0.120	0.093	0.184
Entrmot	1 if mother was self-employed in 1970, 1980 or 1990, 0 otherwise	0.075	0.114	0.075	0.145
<i>Father's level of education (reference category primary education)</i>					
Fatinedu	1 if secondary education, 0 otherwise	0.159	0.126	0.171	0.116
Fathiedu	1 if tertiary education, 0 otherwise	0.141	0.108	0.154	0.095
<i>Mother's level of education (reference category primary education)</i>					
Motinedu	1 if secondary education, 0 otherwise	0.198	0.155	0.211	0.147
Mothiedu	1 if tertiary education, 0 otherwise	0.105	0.072	0.114	0.065
House property					
House	1 if owner-occupied of a house or a flat, 0 otherwise	0.676	0.801	0.680	0.818
Housesum	1 if owner-occupied of a house or a flat and owner a of summer cottage, 0 otherwise	0.036	0.056	0.068	0.136
Regional characteristics					
Native	1 if residing in the (NUTS 3-level) region of birth, 0 otherwise	0.576	0.583	0.626	0.669
<i>Type of (NUTS 4-level) sub-region (reference category: sparsely populated sub-region)</i>					
Metropol	1 if the sub-region belongs to the metropolitan (Helsinki) region, 0 otherwise	0.336	0.251	0.318	0.254
Univreg	1 if the sub-region is a many-sided university region, 0 otherwise	0.243	0.235	0.240	0.216
Regcentre	1 if the sub-region is a regional centre, 0 otherwise	0.190	0.213	0.192	0.203
Indcentre	1 if the sub-region is a industrial centre, 0 otherwise	0.086	0.100	0.099	0.099
Countrys	1 if the sub-region is rural, 0 otherwise	0.100	0.145	0.106	0.155
Densepop	1 if dwelling place in the municipality is urban settlement, 0 if scattered settlement	0.888	0.827	0.869	0.774
Firmavsi	Average size of enterprises in the sub-region (person / enterprise)	4.82	4.57	4.79	4.53
Emprate	Employment rate in the sub-region (%)	65.1	64.1	64.9	64.0
Number of observations		68479	3764	67056	7579

E = wage earners; SE = self-employed All variables are measured in 2001, except creativity which is based on information on each individual's occupation in 2000

Table 2. Relative frequency distributions of earnings by gender and occupational status

Yearly earnings in 2001, € (income subject to state taxation minus transfer payments)	Females		Males	
	Wage earners (n=68 479)	Self- employed (n=3 764)	Wage earners (n=67 056)	Self- employed (n=7 579)
8 000 and under	11.1	25.0	5.6	14.6
8 000 but less than 25 000	60.3	47.0	37.4	38.1
25 000 but less than 45 000	25.1	17.8	44.0	27.9
45 000 and over	3.5	10.2	13.0	19.4
Median	23 100	20 400	26 800	23 600
Mean	21 439	21 974	30 863	31 733
Standard deviation	12 825	23 672	21 001	29 532
Coefficient of variation	60%	108%	68%	93%

Table 3. Estimated earnings equations

Variable	Self-employed		Wage earners	
	Females	Males	Females	Males
<i>Personal characteristics</i>				
Age	-0.043 (2.92)	-0.034 (3.11)	0.046 (25.04)	0.034 (19.04) *
Age2	0.044 (2.67)	0.030 (2.48)	-0.043 (20.49)	-0.039 (19.00)
Workexp1	0.186 (2.50)	0.300 (4.69)	0.262 (29.88)	0.350 (42.11) *
Workexp2	0.611 (7.91)	0.838 (12.60)	0.545 (56.53)	0.610 (63.14) *
Swedish	0.130 (7.91)	-0.094 (1.97) *	-0.026 (2.46)	0.004 (0.44) *
Otherlan	-0.257 (1.68)	-0.266 (3.09)	-0.131 (6.30)	-0.071 (3.92) *
Edutrade	-0.132 (1.34)	-0.093 (1.34) *	0.037 (3.38)	0.059 (5.07)
Edutechn	-0.332 (3.34)	-0.006 (0.10)	0.050 (4.37)	0.134 (14.96) *
Eduagric	-0.356 (2.45)	-0.166 (2.14)	-0.008 (0.39)	-0.009 (0.60)
Eduhesoc	-0.058 (0.60)	0.004 (0.05)	0.048 (4.66)	0.056 (3.37)
Edu servi	-0.389 (4.39)	-0.106 (1.31) *	0.015 (1.38)	0.134 (11.06) *
Edu other	-0.309 (2.68)	-0.183 (1.84)	-0.090 (6.89)	-0.059 (4.00)
Interedu	0.202 (2.30)	0.101 (1.74)	0.094 (9.54)	0.046 (4.86) *
Lohigedu	0.507 (4.70)	0.332 (4.77)	0.206 (16.44)	0.141 (11.52) *
Hihigedu	0.976 (7.61)	0.627 (7.15) *	0.533 (35.75)	0.488 (34.07) *
Creacore	0.338 (4.10)	0.288 (5.17)	0.263 (28.89)	0.316 (37.59) *
Creaprof	0.200 (4.53)	0.017 (0.59) *	0.248 (37.05)	0.325 (49.59) *
Creabohe	0.063 (0.51)	-0.125 (1.41)	0.277 (12.86)	0.144 (7.94) *
<i>Regional characteristics</i>				
Native	-0.08 (0.23)	-0.170 (0.66)	-0.001 (0.16)	-0.026 (5.61) *
Metropol	0.074 (0.60)	0.199 (2.44)	-0.010 (0.52)	0.028 (1.62)
Univreg	-0.309 (0.31)	0.190 (2.98)	-0.061 (4.15)	0.012 (0.385) *
Regcentre	-0.116 (1.28)	0.155 (2.64) *	-0.034 (2.47)	0.0339 (2.62) *
Indcentre	-0.118 (1.16)	0.226 (3.41) *	-0.045 (2.94)	0.094 (6.65) *
Countrys	-0.117 (1.29)	0.108 (1.90) *	-0.028 (2.202)	0.014 (1.04) *
Densepop	0.151 (3.24)	0.140 (4.74)	0.041 (5.40)	0.073 (10.64)
Firmavsi	0.028 (1.14)	0.041 (2.47)	0.017 (5.03)	0.020 (6.12)
Emprate	0.005 (0.92)	0.008 (2.05)	0.008 (9.55)	0.006 (8.54)
Constant	10.30 (22.60)	9.56 (30.04)	7.51 (135.42)	8.11 (152.80)
Mills lambda	-0.525 (9.52)	-0.313 (8.50)	-0.242 (11.80)	0.228 (9.69)
Rho	-0.479		-0.417	
Sigma	1.096		0.581	
Lambda	-0.525		-0.242	
Number of observations	3 764	7 579	68 479	67 056

z-values in parentheses; * marks statistical difference ($p < 0.05$) between females and males

Table 4. Structural probit estimations

Variable	Females Coefficient	Marginal effect	Males Coefficient	Marginal effect	
<i>Personal characteristics</i>					
Age	-0.048 (2.65)	-0.004	0.090 (17.34)	0.013	*
Age2	0.063 (3.22)	0.005	-0.080 (13.39)	-0.012	*
Swedish	0.085 (2.08)	0.008	0.011 (2.73)	0.016	
Otherlan	0.101 (1.77)	0.009	0.455 (8.42)	0.089	*
Edutrade	-0.094 (1.61)	-0.008	0.190 (6.28)	0.031	*
Edu techn	-0.217 (2.19)	-0.016	0.006 (0.26)	0.001	*
Eduagric	-0.076 (0.83)	-0.006	0.068 (1.70)	0.010	
Eduhesoc	-0.106 (1.97)	-0.008	0.424 (7.89)	0.081	*
Edu servi	0.154 (1.57)	0.014	-0.114 (2.62)	-0.015	*
Edu other	-0.262 (3.84)	-0.018	-0.034 (0.63)	-0.005	*
Interedu	-0.105 (1.86)	-0.009	-0.143 (4.86)	-0.021	
Lohigedu	-0.199 (1.96)	-0.016	-0.378 (8.68)	-0.047	
Hihigedu	0.063 (0.49)	0.006	-0.591 (9.00)	-0.061	*
Creacore	0.096 (1.66)	0.009	-0.154 (5.55)	-0.021	*
Creaprof	0.250 (3.69)	0.024	0.234 (3.11)	0.038	
Creabohe	0.311 (4.95)	0.034	0.296 (5.54)	0.052	
<i>Family characteristics</i>					
Marri	0.326 (5.47)	0.023	0.223 (5.73)	0.030	
Cohabit	-0.071 (0.031)	-0.006	-0.024 (0.89)	-0.003	
Oneparen	-0.230 (3.65)	-0.016	-0.087 (2.68)	-0.012	*
Childnum	0.009 (0.84)	0.001	0.012 (1.74)	0.002	
Chilyou7	0.047 (1.33)	0.004	-0.010 (0.34)	-0.001	
Chilyou3	0.080 (1.80)	0.007	-0.023 (0.85)	-0.003	
Chilnoco	-0.051 (0.98)	-0.004	0.119 (3.42)	0.019	*
<i>Spouse's characteristics</i>					
Spouentr	0.399 (6.32)	0.045	0.752 (24.08)	0.169	*
Spouwagw	-0.367 (6.28)	-0.031	-0.180 (5.09)	-0.026	*
Spoustud	-0.489 (3.85)	-0.027	-0.148 (2.89)	-0.020	*
Spoupens	-0.297 (4.35)	-0.020	-0.187 (3.86)	-0.024	
Spounem	-0.397 (5.10)	-0.024	-0.203 (5.01)	-0.026	
Sedutrade	0.020 (0.43)	0.002	0.015 (0.34)	0.002	*
Sedutechn	-0.131 (2.44)	-0.011	-0.066 (1.56)	-0.009	
Seduagric	-0.177 (3.14)	-0.013	-0.028 (0.35)	-0.004	
Seduhesoc	0.071 (1.47)	0.006	-0.014 (0.34)	-0.002	
Seduservi	0.014 (0.26)	0.001	-0.088 (1.94)	-0.012	
Sedu other	-0.009 (0.14)	-0.001	0.029 (0.57)	0.004	
Sinteredu	0.130 (2.81)	0.011	0.012 (0.31)	0.002	*
Slohigedu	0.206 (3.46)	0.019	-0.008 (0.17)	-0.001	*
Shihigedu	0.282 (4.56)	0.029	-0.013 (0.21)	-0.002	*
Spouinco	0.000 (0.04)	0.000	-0.000 (0.09)	-0.000	
<i>Parents' characteristics</i>					
Entrfat	0.131 (3.33)	0.012	0.440 (11.51)	0.081	*
Entrmot	0.240 (6.89)	0.024	0.210 (8.63)	0.034	
Fatinedu	0.069 (1.83)	0.006	-0.003 (0.15)	-0.000	

(Table 4 cont'd)

Fathiedu	0.095 (3.69)	0.008	0.023 (0.84)	0.003	
Motinedu	0.028 (1.39)	0.002	0.010 (0.48)	0.001	
Mothiedu	0.059 (1.50)	0.005	0.043 (1.70)	0.006	
<i>House property</i>					
House	0.111 (6.77)	0.009	0.142 (10.15)	0.020	
Housesum	0.073 (1.57)	0.007	0.182 (9.02)	0.030	*
<i>Regional characteristics</i>					
Native	-0.011 (0.27)	-0.001	0.031 (3.69)	0.004	
Metropol	0.055 (0.79)	0.005	-0.203 (4.23)	-0.028	*
Univreg	0.095 (1.78)	0.008	-0.173 (4.32)	-0.024	*
Regcentre	-0.007 (0.15)	-0.001	-0.160 (4.31)	-0.021	*
Indcentre	0.027 (0.50)	0.002	-0.241 (6.07)	-0.031	*
Countrys	-0.015 (0.29)	-0.001	-0.102 (2.64)	-0.014	
Densepop	0.021 (0.78)	0.002	-0.241 (11.58)	-0.040	*
Firmavsi	-0.030 (2.50)	-0.003	-0.030 (3.49)	-0.004	
Emprate	-0.002 (0.85)	-0.000	0.002 (0.89)	0.000	
Earnings differential	-0.898 (4.39)	-0.075	0.256 (3.34)	0.037	*
Constant	-0.177 (0.35)		-3.514 (20.63)		*
<hr/>					
Number of observations	72 285		74 467		
Wald chi2 (56)	18 300.5		35 569.8		
Pseudo R2	0.102		0.120		

z-values in parentheses, based on Newey-West corrected standard errors, adjusted for 81 clusters (sub-regions);
* marks statistically significant difference ($p < 0.05$) between females and males

Table 5. Maximum and minimum effects of each category of variables on the probabilities of self-employment

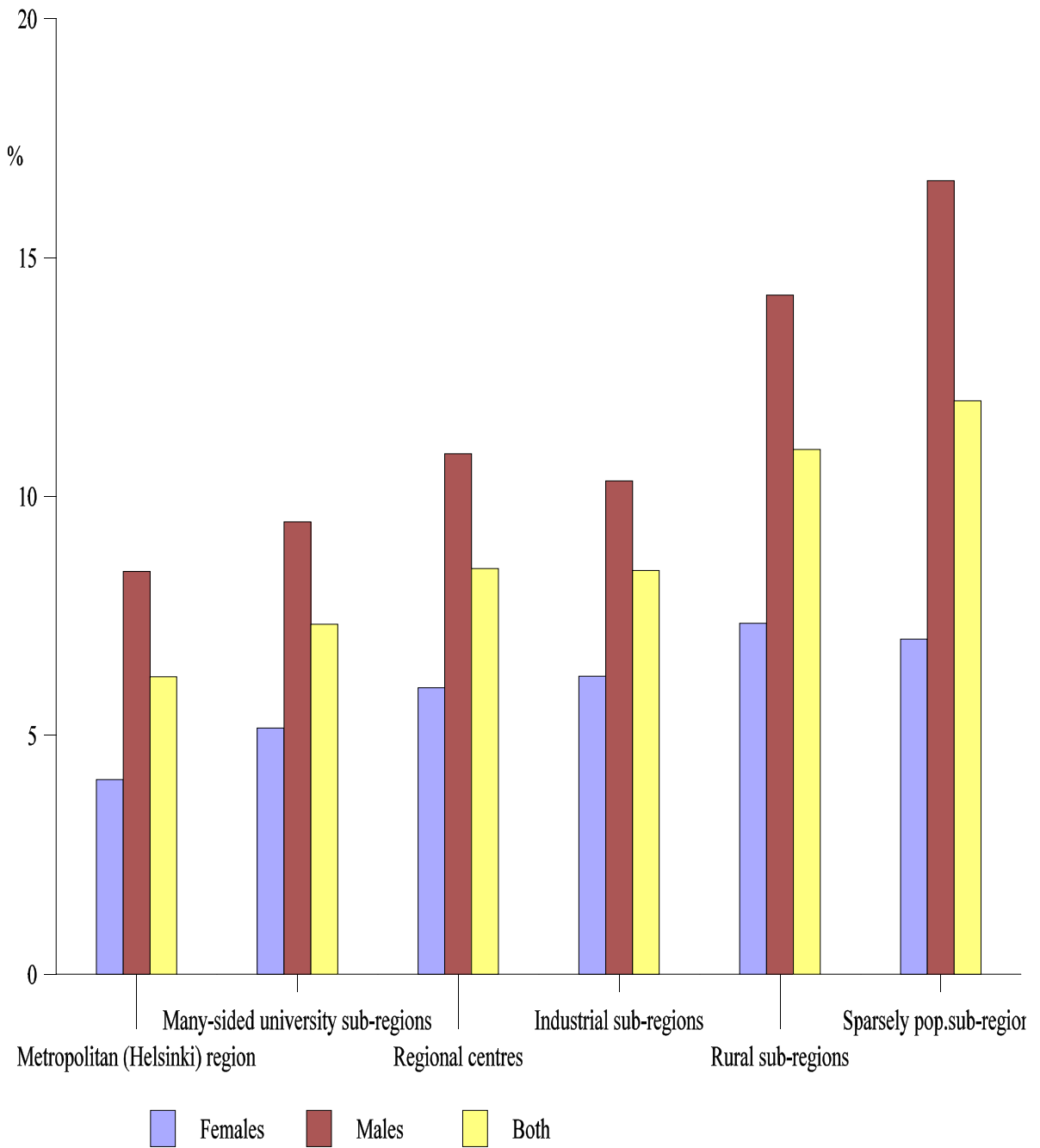
Category of variables	Females				Males			
	Min	Max	Range	Range divided by the average probability (0.039)	Min	Max	Range	Range divided by the average probability (0.078)
Personal characteristics	0.013	0.236	0.223	5.72	0.000	0.581	0.581	7.45
Family characteristics	0.013	0.070	0.057	1.46	0.047	0.129	0.082	1.05
Spouse's characteristics	0.015	0.192	0.177	4.54	0.053	0.296	0.243	3.12
Parents' characteristics	0.033	0.095	0.062	1.59	0.067	0.219	0.152	1.95
House property	0.032	0.048	0.016	0.41	0.063	0.114	0.051	0.65
Regional characteristics	0.026	0.057	0.031	0.79	0.050	0.178	0.128	1.64

Related to each category, the most favourable and unfavourable situation for self-employment are searched for and the probabilities for self-employment in these cases are calculated based on the estimated structural probit models, when the rest of the variables are at their means.

Table 6. Differences in the average predicted probability of self-employment

	Average predicted probability of self-employment
<hr/>	
Using estimated the structural probit equation for males	
Males	0.102
Females	0.119
Using the estimated structural probit equation for females	
Males	0.057
Females	0.052

Figure 1. Self-employment rate by the type of sub-region in 2001



Appendix. Estimated coefficients of reduced form probit

Variable	Females		Males	
<i>Personal characteristics</i>				
Age	0.023	(2.91)	0.045	(7.01)
Age2	-0.068	(0.75)	-0.032	(4.55)
Workexp1	0.186	(2.67)	0.279	(8.35)
Workexp2	0.611	(7.91)	0.349	(9.61)
Swedish	-0.053	(1.35)	0.084	(2.85)
Otherlan	0.221	(2.86)	0.476	(8.89)
Edutrade	0.051	(1.09)	0.129	(3.22)
Edutechn	0.113	(2.35)	-0.053	(1.57)
Eduagric	0.236	(3.19)	0.009	(0.02)
Eduhesoc	-0.011	(0.24)	0.391	(7.68)
Eduservi	0.514	(12.02)	-0.200	(4.40)
Eduother	-0.089	(1.58)	-0.101	(1.83)
Interedu	-0.197	(4.61)	-0.109	(3.20)
Lohigedu	-0.471	(8.91)	-0.306	(7.23)
Hihigedu	-0.324	(5.09)	-0.526	(10.06)
Creacore	0.036	(0.97)	-0.164	(5.42)
Creaprof	0.298	(13.31)	0.153	(8.23)
Creabohe	0.507	(7.78)	0.216	(4.01)
<i>Family characteristics</i>				
Marri	0.333	(5.20)	0.218	(6.31)
Cohabit	-0.070	(2.17)	-0.023	(0.87)
Oneparen	-0.234	(3.62)	-0.083	(2.15)
Childnum	0.101	(1.07)	0.016	(2.30)
Chilyou7	0.037	(1.16)	-0.032	(1.22)
Chilyou3	0.062	(1.51)	-0.029	(0.92)
Chilnoco	-0.052	(1.05)	0.120	(3.28)
<i>Spouse's characteristics</i>				
Spouentr	0.398	(6.18)	0.751	(20.09)
Spouwagw	-0.372	(5.76)	-0.182	(5.45)
Spoustud	-0.483	(3.74)	-0.136	(2.44)
Spoupens	-0.302	(4.39)	-0.195	(4.09)
Spounem	-0.398	(5.26)	-0.207	(5.02)
Sedutrade	0.039	(0.23)	0.011	(0.26)
Sedutechn	-0.135	(2.54)	-0.068	(1.55)
Seduagric	-0.185	(2.70)	-0.048	(0.69)
Seduhesoc	0.061	(0.78)	-0.020	(0.50)
Seduservi	0.005	(0.08)	-0.091	(2-23)
Seduother	-0.010	(0.14)	0.027	(0.56)
Sinteredu	0.135	(2.51)	0.014	(0.35)
Slohigedu	0.213	(2.51)	-0.007	(0.15)
Shihigedu	0.285	(4.01)	-0.015	(0.26)
Spouinco	0.000	(0.08)	-0.000	(0.11)
<i>Parents' characteristics</i>				
Entrfat	0.130	(3.98)	0.435	(18.00)
Entrmot	0.242	(7.15)	0.211	(8.00)
Fatinedu	0.071	(2.65)	-0.004	(0.18)

Fathiedu	0.096	(3.08)	0.028	(1.10)
Motinedu	0.024	(0.98)	0.008	(0.43)
Mothiedu	0.060	(1.63)	0.043	(1.47)
<i>House property</i>				
House	0.109	(4.96)	0.134	(7.57)
Housesum	0.075	(1.94)	0.184	(8.11)
<i>Regional characteristics</i>				
Native	-0.004	(0.20)	0.030	(2.01)
Metropol	-0.011	(0.20)	-0.161	(3.18)
Univreg	0.076	(1.50)	-0.126	(3.18)
Regcentre	0.077	(1.63)	-0.130	(3.52)
Indcentre	0.096	(1.83)	-0.208	(5.05)
Countrys	0.068	(1.45)	-0.081	(2.23)
Densepop	-0.079	(3.13)	-0.225	(12.07)
Firmavsi	-0.042	(3.31)	-0.025	(2.47)
Emplrate	-0.00	(0.02)	0.002	(0.89)
Constant	-2.55	(11.62)	-2.74	(15.33)

z-values in parentheses