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ABSTRACT

What drives women out of entrepreneurship? The joint role of testosterone and culture*

The ratio of second to fourth digit (2D4D) has been shown to correlate negatively with entrepreneurial skills and financial success. We document that in a sample of entrepreneurs women have a lower 2D4D ratio than men, in sharp contrast with the features of the distribution in random samples. Exploiting variation across communities in indices correlated with women emancipation, we show that in regions where women are less emancipated their average DR is lower than that of men compared to regions with higher indices. This finding is consistent with the existence of gender related obstacles into entrepreneurship so that only women with well above average entrepreneurial skills find it attractive to self-select into entrepreneurship.

This finding can rationalize three facts: a) fewer women than men are entrepreneurs; b) the proportion of women among entrepreneurs tends to be higher in countries with higher women emancipation; c) women who break the barrier into entrepreneurship seem to show more masculine traits. We also find that once women enter entrepreneurship, they are equally able than man to translate their ability into outcomes for the firm.

JEL Classification: D22, L21, L25 and L26
Keywords: digit ratio, entrepreneurial ability, entrepreneurship, testosterone and women emancipation

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1 Introduction

Entrepreneurship around the globe is a very masculine occupation. In virtually all developed countries the share of women among entrepreneurs is limited. For instance, the EU Annual Activity Report for 2007 shows that in Austria around 70% for existing enterprizes are managed by men, and women are largely under represented in leading roles in Austrian enterprizes: only in 16% of the companies with more than 50 employees the CEO is a woman. Similar figures prevail in all European countries. In the USA, the fraction of women holding an executive officer position in the *Fortune 500* companies were 13.5 % in 2009; the fraction holding corporate board seats were 15.2 % in 2008 (Soares et al., (2009)). [1]

What explains women failure to become entrepreneurs? One possibility is that women as a group, have less "entrepreneurial ability". In Lucas (1978) model, people self-select into entrepreneurship on the basis of their skill to manage inputs; if entrepreneurial ability is gender-related, then it could explain the smaller fraction of women in managerial positions. Alternatively, women may have different preferences that matter for occupational choice. Entrepreneurship entails more risk taking than working as an employee for a fixed salary; hence more risk tolerant people should self select into entrepreneurship (Kihlstrom and Laffont (1979)). One strand of literature shows that indeed women differ from men in a number of traits that are relevant for occupational choice. Concerning preferences, a robust finding of both field and experimental studies is that in representative samples women are less willing to take risks than men. [2] Regarding attitudes, recent evidence shows that women seem to be less comfortable with competitive pressure and thus less willing than men to engage in competitive interactions such as bargaining (Babcock and Laschever (2003)), tournaments (Gneezy and Rustichini, (2003, 2004a 2004b); Niederle and Vesterlund, (2007)) and auctions (Chen et al (2009)). Interestingly, these literature shows that while men performance seems to be enhanced by increased competition, women performance either responds less or is even hampered (Gneezy and Rustichini, (2004b)). Because of this women may self select into jobs that are sheltered from competitive pressures.

In summary, this first theory is that women differ in abilities or attitudes. A very different explanation is that women, even those endowed with an intrinsic ability to engage in entrepreneurial activities, are discouraged from doing so because culturally-driven norms and beliefs restrict women freedom of occupational choice and inhibit them from choosing what are considered masculine jobs. For instance, given the importance that women play in the reproduction of the specie, norms may have developed that recommend women should not

[1] The list of CEO women in the first 1000 Fortune companies is available at http://www.catalyst.org/publication/322/women-ceos-of-the-fortune-1000

[2] Many papers find significant difference between genders in risk taking. In experimental setting Holt and Laury (2002), Hartog et. al. (2002), Powell and Ansic (1997), Fehr et. al (2006) and Levin, Snyder and Chapman (1988); using field data and surveys, Dohmen et al (2005), Guiso and Paiella (2009), Kimball, Sahm and Shapiro (2007) among others. For a survey of the experimental evidence see Croson and Gneezy (2009).

engage in occupations that absorb a lot of time and energy - managerial and entrepreneurial jobs being certainly of this type. If so, only those with extraordinary intrinsic ability will self-select into entrepreneurship since not doing so would be too large a fee to pay to obey the social norm. But that would imply that very few do so.

The most serious problem in distinguishing these theories (and in studying the role of social norms in the process of occupational choice) is that it is hard to obtain a measure of intrinsic entrepreneurial ability that is independent of previous choices of the individual or that is not the reflection of gender related cultural norms. For instance, differences in risk aversion between the two genders as measured in experiments may reflect differences in initial endowments or lifetime wealth due for example to differences in expected bequest between males and females. Similarly, differences in the way men and women react to competition may not be due to an intrinsic dislike of competition among women but to the prevalence of culturally determined roles. This is suggested for instance by Gneezy, Leonard and List (2006) who compare selection into competitive environments in a patriarchal and in a matriarchal society and find that while in the first men choose the competitive environment twice as often as women, in the matriarchal society the opposite is true. Similarly, Dreber, von Essen and Ranehill (2009) find that contrary to what has been observed among Israeli children by Gneezy and Rustichini (2004b), there is no gender difference in reaction to competition among Swede boys and girls. Whatever the task, boys and girls compete equally, a result that may reflect the fact that Sweden scores high on gender equality measures (Guiso et. al. (2008)).

To distinguish the two theories we propose using a biological marker - exposure to testosterone in womb as reflected in the second to fourth digit ratio - as a measure of entrepreneurial traits, being them skills or preferences, and combine it with variation in beliefs about men/women parity in areas where people are located. This allows to explore whether women potentially endowed with intrinsic entrepreneurial ability actually succeed in becoming entrepreneurs or rather whether they have to give up because they face stronger barriers than men.

We start by illustrating two links that are key to our analysis: the link between the digit ratio, testosterone at birth and gender and the link between testosterone and entrepreneurs traits (Section 2). In Section 3 we describe our main data source - a survey of Italian entrepreneurs for which information on the digit ratio was collected; this section establishes basic features of the data, most notably that contrary to representative samples in our selected one women have a lower digit ratio. Section 4 lays down a conceptual framework about gender occupation selection when both intrinsic entrepreneurial ability and gender differences in emancipation are allowed for and obtains a number of testable predictions; the latter are confronted with the data in Section 5. Section 6 concludes.

2 Digit ratio, gender and entrepreneurial traits

Our arguments is based on two links: the first in the link between gender and testosterone; the second the link between testosterone and entrepreneurs traits. We examine them in turn.

2.1 Gender digit ratio and testosterone

A large literature has established that in representative samples women have a higher digit ratio than man. The difference is significant, and estimated at around 0.04 (Cohen effect size 0.62). This finding is ancient (Baker, 1888), and has been confirmed by recent systematic studies (Manning, Scutt, Wilson and Lewis-Jones, (1998)). The relevant literature, possible explanations of the difference, and implications are discussed in detail in Manning (2002). A possible explanation of the gender difference in the digit ratio has been proposed based on the differential effect of testosterone (facilitating the growth of the fourth digit) and estrogen (for the growth of the second digit).

The fundamental fact that we use here is *not* that there is a gender difference in entrepreneurial ability (or any ability) across genders which should be documented by the difference in the digit ratio. Instead, we rely on large existing evidence on two findings. The first is the one we have just recalled that the distribution of the ratio is different in a particular direction in the two genders belonging to a given population. The second is that, *within* each gender, a number of skills and personality traits are correlated with the digit ratio, and entrepreneurial ability in particular is negatively correlated with the ratio. These findings, most notably the first, hold in randomly selected samples. Our sample of self-selected entrepreneurs may differ substantially in this respect, and this difference is what we plan to use to separate the two explanations of the gender difference in participation in managerial activity, one based on difference in ability and the other on social selection.

2.2 Digit ratio, testosterone and entrepreneurial traits

Exposure to testosterone in pre-natal period, as marked by the digit ratio, has been shown to be linked to several personalty characteristics, attitudes and skills. The traits that are interesting for us are preferences for risk, and entrepreneurial ability in Lucas (1978) sense - i.e. ability to manage a larger and presumably more complex set of inputs. A lower digit ratio has been found to be associated with higher earnings and better ability to remain in a competitive job in the City of London (Coates, Gurnell, Rustichini, 2009). Sapienza, Zingales and Maestripieri (2009) find an effect of digit ratio on career choice. The reason for such correlation is still being investigated. Two possible explanations are natural: one is that the effect is through risk taking, the other is that digit ratio is correlated with higher ability. There is some evidence that more risky behavior is associated with a lower digit ratio: for example, Schwerdtfeger et

al. (2010) have reported a higher rate of traffic violations in male frequent car drivers. (Apicella et al. (2008) document a correlation between current testosterone and risk taking in a financial decision task; they find no correlation with digit ratio). The second is that digit ratio affects ability. A correlation between managerial ability in particular and digit ratio is found in our data set (and is documented in Guiso and Rustichini, 2010).

3 The survey and basic facts

3.1 The survey

Our main data set is a survey of entrepreneurs or top CEOs conducted by ANIA ("Associazione Nazionale fra le Imprese Assicuratrici", or Italian National Association of Insurance Companies), on a sample of 2,295 private Italian firms with a number of employees up to 250. The survey, conducted between October 2008 and June 2009, consisted of two distinct questionnaires. The first collected general information on the firm, and was filled by the firm managers on a paper form. The second questionnaire collected information on the entrepreneur or the top CEO and, quite uniquely, it was filled in face to face interviews by a professional interviewer of a specialized company, using the CAPI (Computer Assisted Personal Interviewing) method. During the interview several broad groups of data were collected, including information on a number of traits, abilities and preferences of the entrepreneur; information on his own personal wealth holdings or those of his/her family; and several details on physical traits, family background and demographics, including gender, order of birth and siblings, height and pigmentation, among many others. Tables 1 and 2 present some summary statistics on the firms that were part of the survey.

Insert Tables 1 and 2 here

The Appendix describes the survey design in greater detail and provides a precise description of the variables used in this study. At the end of the personal interview, the interviewer asked each participant in the survey whether he or she was willing to have the length of the fingers measured. They were first informed that some recent research has established a link between choice of employment and success and some physical characteristics of a person. No mention was made of the direction of this link. If the participant accepted, the four measurements (second and fourth fingers of both hands) were collected with an electronic caliper, with small measurement error ($0.02mm$). Each interviewer had his own tool; they were given a written protocol on how to execute the measurement and specifically trained for this task by the company. As part of the procedure they asked the subjects to keep the hand as straight as possible; fingers on the right were measured first, and then those on the left. The length measured was from the middle of the bottom crease at the base of the finger to its tip.

3.2 The digit ratio

Out of 2,295 entrepreneurs interviewed, 1,366 agreed to have the fingers length measured. The decision to participate in the measurement is correlated with various observables: it is lower among male entrepreneurs and increasing with age and the height of the interviewed. Education instead has no predictive power as much as the age of the firm and the number of years the entrepreneur has been in control of the company (details are reported in Table 3).

Insert Table 3 here

This features may create a potential for selection bias. We account for this by including three controls for interviewer characteristics that empirically have predictive power on the willingness of the entrepreneurs to let the interviewer measure his/her fingers. Specifically, we include gender, age and height of the interviewer. As Table 3, second column shows these variables have predictive power on the entrepreneur willingness to participate in the measurement. Since these characteristics belong to the interviewer there is no reason why they should be correlated with the residual in equations that model entrepreneur behavior that we will estimate latter; thus, they can be used as an instruments to account for potential selection.[3]

3.3 Gender difference in 2D:4D in the sample

For the sample of participants in measurement Figure 1 shows the sample distribution of the digit ratio of the right hand (the one typically used in these studies; the distribution is similar of the left hand) for man and women.

In both cases the distribution is centered around around 1 and is fairly symmetric, but departs from normality because it appears leptokurtic (Kurtosis 5.13). Most interestingly, the women's DR distribution has a slightly smaller mean - a finding that runs contrary to all previous evidence on gender differences in 2D:4D, as we recalled in section 2.1. To highlight the differences in mean in Table 4 we run regressions of the digit ratio on a dummy for gender and various classical determinants such as the height of the individual and whether he/she was first born which have been found to correlate with the digit ratio.

Insert Table 4 here

The first two columns report results for the right hand and the last two for the left hand. As in previous studies we find that first born and taller entrepreneurs have a significantly lower digit ratio (Barut et al., 2008 have similar finding on height; Manning 2002 has weaker evidence of this). Differently from all other studies we find that in our sample of entrepreneurs, females have a *lower* digit ratio. Depending on whether we look at the right or left hand the

[3] We have also used as an exclusion restriction a measure of affinity between the interviewer and the entrepreneurs as reported by the interviewer at the end of the interview. Specifically, we have used the answers to the the question: "On a scale between 0 and 10 what do you think is your affinity with the person interviewed?" Results using this measure are very similar to those reported.

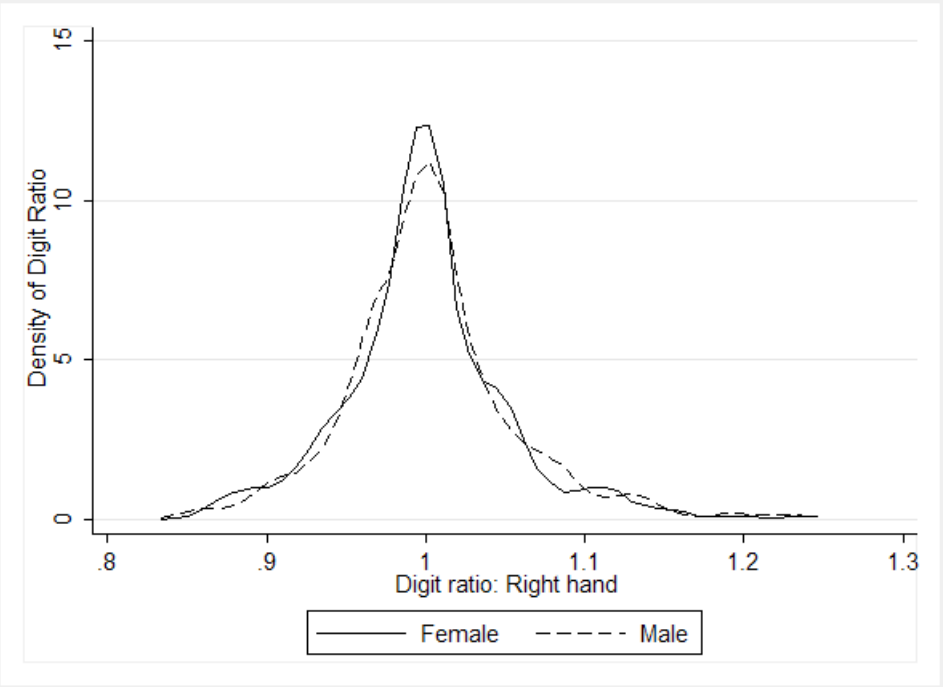

Figure 1: Density of the Digit ratio in male and female subjects in the sample.

difference ranges between 10 and 15% of the sample standard deviation in the digit ratio, and it is significantly different from zero in almost all specification reported in Table 4, including the one in the last column where estimates are adjusted for selection using a two step probit estimator. Since in representative samples females digit ratio exceeds men ratio by around 0.04, a more telling null hypothesis is that the female dummy in our regressions is equal to 0.04. This is always strongly rejected.

4 Model

4.1 Conceptual background

The implications for personality characteristics and ability of differences in digit ratio are still being established; so we have to be particularly careful in the assumptions we make on this point. In our companion paper (Guiso and Rustichini 2010a) we provide evidence that a lower digit ratio is associated with a higher level of entrepreneurial ability. This statement is true as long as the comparison concerns individuals of the same gender, and this is the assumption we make:

Assumption: *Everything else being equal, the distribution of entrepreneurial ability of an individual A dominates (first order stochastic dominance) that of individual B of the same gender with higher digit ratio.*

This assumption says nothing, of course, about the comparison between two individuals of different gender. In particular a strong statement like the assumption that we just made without the condition that the individuals A and B are of the same gender is probably false, and we do not use it in the following. A weaker statement might be that the expected difference in ability between two individuals of the opposite gender with the same digit ratio is a constant independent of the digit ratio. For example, a statement that a men and a woman with digit ratio in the same percentile of the corresponding gender have the same ability seems appealing. There is however no evidence yet to support or reject such claim, so we do not assume this either. Consider now our finding that women in the sample of entrepreneurs have a lower digit ratio than men in the same sample, contrary to the evidence in random samples. This fact alone may suggest that the barrier for women to enter a managerial career is higher than for men. The latter conclusion would indeed follow under the assumption that the distribution of ability for two individuals of opposite gender with digit ratios equal to, say, the corresponding median. Without this assumption, we have to introduce additional information to test our hypothesis: regional measures of women emancipation.

4.2 Measuring women emancipation

We obtain information on the degree of women emancipation by using differences in beliefs about the role of women in society across Italian regions. For this we rely on the 2005 wave of the *World Values Survey* and use data on responses to four questions. Subjects were asked to rate on a four levels scale the following different statements: a) "Being a housewife is just as fulfilling as working for a pay"; b) "On the whole, men make better political leaders than women do"; c) "A university education is more important for a boy than for a girl"; d) "On the whole, men make better business executives than women do". Respondents could answer: "Strongly agree", "Agree", "Disagree", "Strongly disagree", which we code from 1 to 4. Each measure may be taken as increasing with beliefs that reflect women emancipation and gender parity. Figure 2 shows the sample distribution of the four indicators and documents substantial heterogeneity in beliefs. Disagreement with the statements prevails but there are differences across statements.

The vast majority disagree that university is more important for a boy than for a girl; however a smaller fraction disagrees that men are better political leaders than women. Table 5 reports the correlation matrix between the four indicators: indicators are all positively correlated but with intensity varying between a minimum of 0.128 and a maximum of 0.62.

Insert Table 5 here

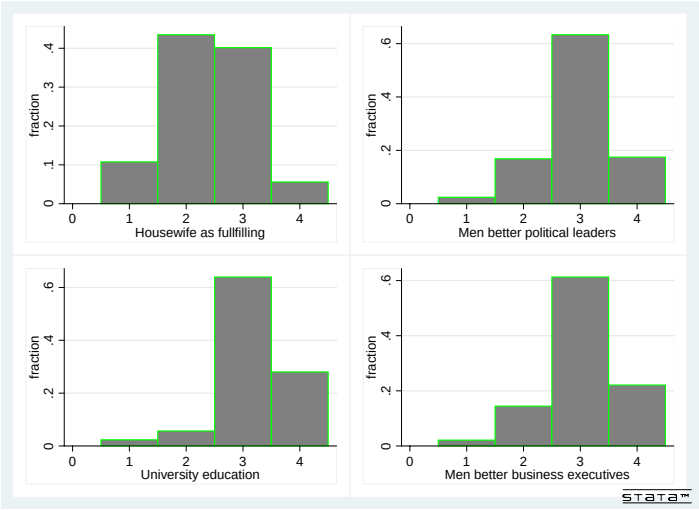

Figure 2: Histograms of the answers to the questions: "Being a housewife is a just as fulfilling as working for a pay", "On the whole, men make better political leaders than women do", "A university education is more important for a boy than for a girl", "On the whole, men make better business executives than women do".

Out of the these variables we construct two indexes of women emancipation: the first is the score statement (d), reflecting the disagreement with the statement that men make better business executives than women. To construct the second we extract the first principal component of the four variables (correlation with the elementary indicators is shown in the last row of Table 5). We than take regional means of these two indexes and mach them with our entrepreneurs data set by assigning to each entrepreneur in our sample the degree of women emancipation prevailing in his/her region of residence (20 regions in all). Table 1 shows summary statistics of the two measures. [4]

4.3 Model and implications

To capture formally the basic links between ability, emancipation and job selection and obtain some testable implications consider the following simple model. An agent faces the choice of working as an employee and earning wage w or as

[4]We also constructed two analogous indicators: the first follows the procedure above but uses only women answers to the questions. The second was obtained by running a regression of the principal component measure or of the other indicator on demographic controls and a full set of regional dummies; the coefficients on these dummies are then taken as measures of women emancipation in the regions. The advantage of this procedure is that it accounts for differences in the composition of respondents across regions. Results are invariant to using these alternatives.

a manager/entrepreneur and earning profit Π. Each agent is endowed with a given ability A_i and each can produce output y using the diminishing returns technology $y_i = A_i L_i^{\alpha}$, where L is labor input - the only input in production. Ability in the population is distributed according to the cumulative $F_x(A)$ where $x \in \{M, W\}$ allows for the possibility that the distribution differs among men (M) and women (W).

We capture our basic assumption that women face stronger obstacles into entrepreneurship than men by assuming that there is a cost to enter entrepreneurship that depends on the degree of women emancipation $e = [0, 1]$ defined in the interval $[0, 1]$ where 1 stands for full emancipation; for men $e = 1$. The monetary equivalent of this cost is a tax on profits at a rate $1 - e$. Optimal firm size and profits conditional on becoming an entrepreneur are

$$L_i^* = (\frac{\alpha A_i}{w})^{\frac{1}{1-\alpha}}$$

and

$$\Pi_i^* = (1-\alpha)\alpha^{\frac{\alpha}{1-\alpha}} A_i^{\frac{1}{1-\alpha}} w^{-\frac{\alpha}{1-\alpha}};$$

thus agent i chooses to be an entrepreneur if

$$e\Pi_i^* = e(1-\alpha)\alpha^{\frac{\alpha}{1-\alpha}} A_i^{\frac{1}{1-\alpha}} w^{-\frac{\alpha}{1-\alpha}} \geqq w$$

or

$$A_i \geqq \frac{w}{me^{(1-\alpha)}} = \overline{A}(w, e)$$

where $m = \alpha^{\alpha}(1-\alpha)^{(1-\alpha)}$.

This set up allows to draw the following implications:

1. The threshold $\overline{A}(w, e)$ for becoming an entrepreneur is decreasing in the degree of emancipation,
$$\frac{\partial \overline{A}(w, e)}{\partial e} < 0.$$
Hence, the ratio of the density of women to men in entrepreneurship $\frac{1-F_W(\overline{A}(w,e))}{1-F_M(\overline{A}(w,1))}$ is higher in areas where emancipation is higher.

2. The average intrinsic ability of women entrepreneurs is, everything else being equal, higher where the emancipation is lower, because the threshold is higher; this is clear since the expected ability as a function of the threshold $\overline{A}$
$$\frac{\int_{\overline{A}}^{\infty} A dF_W(A)}{1 - F_W(\overline{A})}$$
is increasing in the threshold.

3. Finally, the optimal firm size is

$$L_i^* = (\frac{\alpha A_i}{w})^{\frac{1}{1-\alpha}}$$

which is increasing with ability and is unrelated to gender or emancipation. That is, once a woman makes it into entrepreneurship the translation of its intrinsic ability into firm outcomes is no different than that of men. This implication follows from the assumption that gender only affects the distribution of ability but not the technology that translates ability into output; and emancipation, being a tax on profits, only affects occupational decisions but not optimal firm size and thus the relation between intrinsic ability and firm output. Whether this is true or not is an empirical matter which is interesting to test.

4.4 Predictions

The three implications we have described in section 4.3 can be formulated as follows in terms of correlations between the digit ratio as indirect measure of intrinsic ability, measures of women emancipation and our variables of interest.

First, the incidence of women among entrepreneurs should be higher in regions where women emancipation is higher. We test this prediction with a regression of the fraction of women among the entrepreneurs in the sample in each Italian region, on an index of women emancipation. The coefficient of the index should be positive. We test this prediction in section 5.1.

The second prediction considers the effect on the female/male gap in the digit ratio, taken as indirect measure of entrepreneurial ability, of regional differences in beliefs about women ability (and any opinion that more generally they can represent). The prediction is that when an index of women emancipation is higher, the DR for women is higher, because access to a larger number of women into the entrepreneurial activity is possible and thus the distribution of women DR in that region becomes more similar to the one in a representative sample. Hence the female/male gap should tend to become more positive (or less negative). We test this prediction by regressing the digit ratio on several variables, a female dummy and an interaction between the female dummy variable and the index of women emancipation. This coefficient should be significant and positive. We test this prediction in section 5.2.

The final prediction is that the relation between intrinsic ability and firm size does not depend on gender or on women emancipation: that is, once women enter entrepreneurship, they are equally able than man to translate their ability into outcomes for the firm; in particular the firm size. This prediction is tested in section 5.3.

5 Results

5.1 Women emancipation and female entrepreneurship

We test the first prediction that the incidence of women among entrepreneurs should be higher in regions where women emancipation is higher in Table 6. The dependent variable is the fraction of women entrepreneurs in our sample in each of the 20 regions of Italy and is regressed on our indexes of women emancipation in the region.

Insert Table 6 here

The first column reports estimates using the principal component of the four elementary indicators of beliefs about women versus men roles and it shows a positive and significant correlation between the incidence of women entrepreneurs and women emancipation. This result is unaffected if we add a South dummy and thus rely only on within area variation in women emancipation.

The other two columns, 3 and 4, show the results when we use the answers to statement "men make better business executives than women do". In this case too the fraction of women entrepreneurs is higher where the index of women emancipation is higher and is unaffected when adding a dummy for the South. Furthermore estimates using this indicator are even more precise, perhaps because it provides a more direct measure of the cultural obstacle women face in becoming entrepreneurs.

The effects of both variable are significant, and support the prediction: a larger regional index of women emancipation is associated with a larger fraction of female entrepreneurs among the subset of subjects for that region. The effects are large for the two indices. Using either one of two sets of estimates, moving from the region in the 10th percentile of emancipation index to the one in the 90th percentile results in a higher fraction of women entrepreneurs of 14.4 percentage points - one half of the average share of women entrepreneurs in the sample.The first prediction made no use of the digit ratio measurement. We now turn more specifically to the interaction between the value of the index of intrinsic ability and that of women emancipation.

5.2 DR and female entrepreneurship

In Tables 7 and 8 we report the results of the regression with the interaction of the gender and women emancipation index on the digit ratio in the sample. We estimate the following equation:

$$DR_i = a_0 + a_1 Female_i + a_2 Female_i * E_R + f_R + Z_i\beta + \epsilon_i \qquad (1)$$

where DR_i is the digit ratio of entrepreneur i, Female is dummy for gender (1 if entrepreneur is a woman, 0 otherwise) capturing systematic differences in DR between the two genders; E_R is the degree of women emancipation in region

R where individual i is located, Z_i is a vector of individual traits that have been found to correlate with the digit ratio and ϵ_i a disturbance term.

In a representative sample one should expect $a_1 > 0$. In our selected sample, as we have already documented in Table 4, the opposite is true: women entrepreneurs have a lower digit ratio than men entrepreneurs: $a_1 < 0$. The key test of our explanation of this anomaly - that it reflects a higher ability requirement for women because of cultural prejudice - is offered by the third term, the interaction between the female dummy and the index of women emancipation in region R where the entrepreneur is based. If women emancipation lifts women obstacles to starting a firm, the digit ratio of women relatively to that of men should get closer to what is observed in a representative sample. Hence a_2 should be positive. There could be systematic differences across regions in the easiness of starting a firm (e.g. Guiso and Schivardi, 2011) independently of gender; these differences may arise because administrative costs may be higher in some areas, or because the minimum size required to set up a business differs across areas. These differences, if present, trigger different levels of minimum ability to become an entrepreneur and thus of the average level of our proxy for it, the digit ratio. The regional fixed effects f_R in (1) will capture all these channels of influence. Tables 7 and 8 show the result of the estimates.

Insert Tables 7 and 8 here

Table 7 shows results for the right hand; in column (1) the interaction between the male dummy and the principal component index of women emancipation is positive and statistically significant lending support to the model prediction. In column (2) we report estimates of the second-stage Heckman model that accounts for potential selection as not all entrepreneurs were willing to participate in the finger's measurement. The exclusion restrictions for identifications are the three characteristics of the interviewer (age, gender and height) included in the first stage probit (reported in the bottom part of the table). The parameter estimate of the interaction between the female dummy and women emancipation has the same sign as in the first column but is somewhat larger and estimated with greater precisions. Column (3) adds to the specification also an interaction between the female dummy and a South dummy; even in this case results are unaffected suggesting that the women emancipation index in not capturing some geographical variable other than women emancipation that affects occupational choice differentially by gender. The last three columns show estimates similar to those presented in the first three, but using as measure of women emancipation people's views about whether male make better managers than women. In this case too the interaction between the female dummy and the index of emancipation is positive and significant in all specification and even more precisely estimated.

Table 8 reports results when we use the digit ratio of the left hand to measure intrinsic ability. Results are very similar to those reported in Table 7. In all cases the interaction between the female dummy and women emancipation is positive and significant, the effect is robust to selection and to adding an interaction between gender and the South dummy and to the measure of women

emancipation.

In the least emancipated region (using the estimates in third column of Table 7) the women/men difference in digit ratio is -0.102 - larger than the sample standard deviation in the digit ratio; in the most emancipated region the gender gap in digit ratio flips sign though it remains small (0.0048) compared to the difference in representative samples. Overall this evidence seems very much consistent with the idea that cultural belief that consider certain jobs as masculine - namely entrepreneurship - induce women to choose them only when they have an amount of talents that far exceeds that necessary to induce the choice when such such norms are not binding and people are free to chose whatever occupation they like.

5.3 Digit ratio, size and gender

To test the last prediction - the relation between intrinsic ability and firm size does not depend on gender or on women emancipation - we run regressions of firms size on the digit ratio. We measure firm size in our sample using the number of employees. Besides including the digit ratio we also control for the age of the firm, a full set of industry dummies to account for differences in firm size across industries and a set of regional dummies to capture any difference across regions due to institutional features of various sorts (e.g. differences in legal enforcement, credit availability or firm subsidies) that may affect firm size. In addition we control for the age and education of the entrepreneur, the number of years he has been in control its height and whether he is first born. To check whether women are better or less able than men to translate their ability into outcomes once entrepreneurs and whether this depends on emancipation we add to the specification interactions between: the digit ratio and a female dummy; the digit ratio and the index of women emancipation; these three variables (besides the female dummy directly; the direct effect of women emancipation being captured by the regional dummies). For each regression we compute two F tests: the F test for the null that all the terms involving the digit ratio are equal to zero; the F test for the null that only the interactions of the digit ratio with gender and emancipation are equal to zero. If ability matters for firm outcomes and matters independently of gender and emancipation we should reject the first null hypothesis but not the second.

Table 9 illustrates the results.

Insert Table 9 here

In all regressions we insert the Mill's ratio computed from a probit estimate of the probability of participating in the measurement of the digit length to account for selection, using interviewer characteristics as exclusion restrictions (see Table 3). As a measure of women emancipation we use the principal component indicator; results are unchanged using the other measure. The first column reports the regression with all the controls but no interaction terms between the digit ratio, gender and emancipation. It establishes that the digit ratio is negatively and significantly correlated with firm size (as in Guiso and Rustichini

(2010)) - that is entrepreneurs with higher exposure to prenatal testosterone run larger firms: one standard deviation decrease in the digit ration is associated with a 7% increase in the average size of the firm. This finding supports our contention that the digit ratio captures intrinsic entrepreneurial ability. It is worth noticing that in this and subsequent specifications the direct effect of the female dummy is zero. That is there is no difference in the size of firms managed by male and female entrepreneurs once we control for the digit ratio and for other observables. In our data gender per sè is uncorrelated with firm size.

The second column adds an interaction between the female dummy and the digit ratio. This interaction is small in size and not statistically significant. We can reject the null hypothesis that all the terms involving the digit ratio are jointly equal to zero but obviously cannot reject that interaction term is zero (F test 2.42, p-value 0.07). This implies that once they choose to become entrepreneurs men and women are equally good at translating their ability into firm outcomes.

The third column adds also an interaction between the digit ratio and women emancipation. Not surprising as we add interaction terms between the digit ratio and gender and emancipation the direct effect of the digit ratio looses some precision but its coefficient - and thus its effect on size - is fairly stable. Furthermore the joint hypothesis that all interaction terms are jointly equal to zero cannot be rejected (p-value=0.302) while we reject the null that all the terms involving the digit ratio are zero (p-value 0.0702). Finally the fourth column adds also a three-way interaction between the digit ratio, the female dummy and emancipation. The result is unchanged: the test of the null that all variables involving the digit ratio are equal to zero is rejected (p-value 0.078) while the test that all the interactions with the digit ratio are zero cannot be rejected (p-value 0.277). We read this evidence as consistent with gender and limited emancipation acting as a barrier for talented women to enter entrepreneurship; but once they cross the barrier neither gender nor emancipation affect women capacity to exploit their entrepreneurial talent.

6 Conclusions

The fact than women occupy a substantially smaller fraction of leadership positions in virtually all professions is an important policy issue. The fact is beyond dispute, in spite of modest improvements in recent years. Whether remedies are possible or desirable depends crucially on the reasons for the fact.

Two competing hypotheses have been proposed: one is that there is an intrinsic difference in entrepreneurial ability between men and women. In an extreme form, this hypothesis predicts that two individuals of the same intrinsic ability will have the same probability to access entrepreneurial activity, no matter what their sex is; but two individuals of different sex will have different ability. The second is that social norms, conventions, or simply direct discrimination affect the access of women to leadership positions. In an extreme form,

this hypothesis predicts that two individuals of different sex will have on average the same intrinsic ability but different probability to access entrepreneurial activity.

The two explanations are not of course mutually exclusive. A research aimed at determining how much of truth there is in each will have eventually to use a direct measure of ability or some sufficiently precise approximation. Our paper is one step in this direction, in that it introduces one such proxy, the digit ratio. For reasons that we have discussed in section 4.1, researchers do not have yet enough evidence to make inferences on the relative level of expected ability of two individuals of opposite sex on the basis of their digit ratios. This evidence may be obtained in the future, so this first step is a methodological advance.

In the meantime, we can however make correct inferences based on the comparisons of digit ratios of individuals of the same sex. This comparison allows us to test and reject the first, extreme hypothesis, that the gender gap in participation to leadership positions is entirely due to differences in intrinsic ability. In fact an implication of this theory is that there should be no effect of gender-related beliefs on the fraction of women entrepreneurs. This result only requires evidence on the correlation between the fraction of women entrepreneurs and beliefs. The use of our indirect measure of ability allows us to prove that beliefs play an independent role (and do not simply reflect different regional values of intrinsic ability) and end up affecting the distribution of ability in the sample of individuals who become entrepreneurs. In other words, our results show that the second explanation that social norms or discrimination affect the access of women to leadership positions is at least in part true.

Appendix

The ANIA survey

The ANIA Survey for Small Business Companies collects data on a sample of 2,295 Italian firms and their top manager. The survey was conducted on a sample of small Italian firms, having up to a maximum of 250 employees, extracted from the total number of companies present in CERVED - a business information agency operating in Italy which collects companies balance sheet data. The survey was conducted between October 2008 and July 2009; the field study therefore covered the entire financial crisis. Compared to the initial target set at the completion of 2,300 interviews, the investigation closed with 2,295 completed interviews. Participation in the survey entails the willingness to provide information on the use of insurance markets and details regarding the firm as well as the willingness of the top CEO/owner of the company to take part in a face to face interview with a professional interviewer. The first type of data was collected through a questionnaire filled out by each company, while the second type was obtained through an interview using the CAPI (Computer Assisted Personal Interviewing) method. Partly due to the difficulties that many firms have faced during the crisis, it proved to be more complex and difficult than usual to have the firm and the entrepreneur agree to participate in the survey. Moreover, the fact of directly interviewing the firm owner or CEO decreased the acceptance rate of the interviews, particularly for firms in the larger size categories and lengthened the time of the field study. Partly for this reason it was necessary to review the survey design in order to include a larger number of smaller firms (with less than 20 employees). This caused the sample to be more biased towards smaller firms than the population of businesses of up to 250 employees found in CERVED. In the final sample of 2,295 firms, 98.5% are private, located in 59% of cases in north Italy, 19% in central Italy and 22% in the south and islands. In 85% of cases these are controlled by an individual within a family and a remaining 10% by a group of people without family ties.

Variables definitions

Here we provide a detailed description of the variables used in the paper whose definition is not obvious.

Affinity : assessment about the affinity with the interviewed entrepreneurs provided by the interviewer on a scale between 0 (no affinity) and 10 (very high affinity).

Age of entrepreneur: in years

Education: Number of years of schooling of the entrepreneur

Firm age: Years since firm foundation

Firm size: Measured as number of employees.

First born: Indicator equal to 1 if entrepreneur is the first born child

Height: Entrepreneur's height in centimeters

Male: Indicator equal to 1 if entrepreneur is a male

Women emancipation, principal component: First principal component using the four elementary beliefs illustrated in the text and then taking regional averages.

Women emancipation, single answer indicator: Values of the disagreement with the statement "Men make better executives than women do", averaged out across regions.

Years in control: Number of years since the entrepreneur has acquired the responsibility of the management of the firm

References

[1] Apicella, A. Dreber, B. Campbell, P.B. Gray, M. Hoffman and A.C. Little,(2008) "Testosterone and financial risk preferences", Evolution and Human Behavior 29:384–390

[2] Barut Cagaty, Tan Uner and Dogan Asli, (2008), "Association of height and weight with second to fourth digit ratio (2D:4D) and sex differences.", Perceptual and Motor Skills, 106:2, 627–632.

[3] Baker, (1888), "Anthropological notes on the human hand", American Anthropologist, 1: 51–76.

[4] Coates, J., Gurnell, M. and Rustichini, A., (2009), "Second to fourth digit ratio predicts success among high-frequency financial traders", Proceedings of the National Academy of Sciences, 106, 2:623-628.

[5] Croson, Rachel and Uri Gneezy (2009), "Gender Differences in Preferences", Journal of Economic Literature, 47:2, 1–27.

[6] Dohmen, Thomas, Armin Falk, David Huffman, Uwe Sunde, Jürgen Schupp, and Gert G. Wagner (2005), "Individual Risk Attitudes: New Evidence from a Large, Representative, Experimentally-Validated Survey." Institute for the Study of Labor Discussion Paper 1730.

[7] Dreber, Anna, Emma von Essen and Eva Ranehill (2009) "Outrunning the Gender Gap – Boys and Girls Compete Equally", Working Paper Series in Economics and Finance 709, Stockholm School of Economics

[8] Fehr-Duda, Helga, Manuele de Gennaro, and Renate Schubert, (2006), "Genders, Financial Risk, and Probability Weights" Theory and Decision, 60(2–3): 283–313.

[9] Gneezy, Uri, and Aldo Rustichini (2004a), "Executives versus Teachers." mimeo

[10] Gneezy, Uri, and Aldo Rustichini. 2004b. "Gender and Competition at a Young Age." American Economic Review, 94(2): 377–81.

[11] Guiso, Luigi and Monica Paiella (2008) "Risk Aversion, Wealth and Background Risk", Journal of the European Economic Association, 6, 6: 1109-1150.

[12] Guiso, Luigi,Ferdinando Monte, Paola Sapienza and Luigi Zingales (2008), "Culture, Gender and Math", Science : 320, 5880, 1164 – 1165.

[13] Guiso, Luigi,Fabiano Schivardi (2011), "What Determines Entrepreneurial Clusters?", Journal of The European Economic Association: forthcoming

[14] Hartog, Joop, Ada Ferrer-i-Carbonell, and Nicole Jonker (2002), "Linking Measured Risk Aversion to Individual Characteristics." Kyklos, 55(1): 3–26.

[15] Holt, Charles A., and Susan K. Laury (2002), "Risk Aversion and Incentive Effects." American Economic Review, 92(5): 1644–55.

[16] Kihlstrom, R. and Laffont, Jean Jack (1979), 'A general equilibrium theory of firm formation based on risk aversion', Journal of Political Economy 87, 719–48.

[17] Kimball, Miles S., Claudia R. Sahm and Matthew D. Shapiro (2007), "Imputing risk tolerance from survey responses", NBER WP 3337

[18] Levin, I. P., M. A. Snyder, and D. P. Chapman, (1988), "The Interaction of Experimental and Situational Factors and Gender in a Simulated Ricky Decision-Making Task." Journal of Psychology, 122(2):173–81.

[19] Manning John T., Scutt D., Wilson J., Lewis-Jones D.I., (1998), "The ratio of 2nd to 4th digit length: a predictor of sperm numbers and concentrations of testosterone, luteinizing hormone and oestrogen", *Human Reproduction*, 13, 3000-3004.

[20] Manning, John (2002), "Digit ratio: a pointer to fertility, behavior, and health", New Brunswick, N.J: Rutgers University Press.

[21] Niederle, M., L. Vesterlund, (2007), "Do Women Shy away from Competition? Do Men Compete too Much?" Quarterly Journal of Economics 122, 1067-1101

[22] Powell, Melanie, and David Ansic (1997), "Gender Differences in Risk Behaviour in Financial Decision-Making: An Experimental Analysis." Journal of Economic Psychology, 18(6): 605–28.

[23] Sapienza, P., Zingales, L. and Maestripieri, D. (2009), "Gender differences in financial risk aversion and career choices are affected by testosterone", Proceeding of the National Academy of Sciences, 106, 5, August.

[24] Soares, Rachel, Nancy M. Carter, and Jan Combopiano, (2009) Catalyst Census: Fortune 500 Women Board Directors.

[25] Schwerdtfeger, Andreas, Regina Heims and Johannes Heer, "Digit ratio (2D:4D) is associated with traffic violations for male frequent car drivers", Accident Analysis and Prevention, 42:269–274

Table 1: **Summary statistics.** Mean, median and standard deviation (SD) for Age, Years in Control (of the firm), and Digit ratios.

	Male			Female			Sample		
variable	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Panel A: Nr. of Employees									
All regions	33.65	20	42.14	27.69	20	35.59	31.63	20	40.12
North West	33.08	20	39.86	33.34	18	44.12	33.16	20	41.17
North East	39.02	20	50.59	30.76	20	40.81	36.17	20	47.58
Center	35.59	23	39.12	25.93	20	25.90	31.93	21	35.01
South	25.48	16	33.38	22.81	13	34.54	24.68	15	33.72
Panel B: Demographics									
Age	48.83	48	12.19	48.83	48	10.62	47.46	47	10.37
Years in Control	15.84	13	11.74	13.59	11	10.69	15.21	12	11.74
Panel D:									
Digit ratio, Right hand	1.002	1	0.052	0.999	0.999	0.051	1.001	1	0.052
Digit ratio, Left hand	1.002	1	0.049	0.995	0.997	0.049	0.998	0.999	0.049

Table 2: **Summary statistics:** Fraction of males in the sample in four regions and women emancipation index. The variable "Better executives" indicates the degree of agreement with the statement "On the whole, men make better business executives than women do". "PC" is the principal component of four variables describing women emancipation, averaged across regions. The four variables are described more in detail in Table below.

variable	Mean	Median	SD
Male, Sample	0.66		
Male, North West	0.68		
Male, North East	0.65		
Male, Center	0.62		
Male, South	0.70		
Better executives	2.97	3.03	0.22
PC	-0.187	0.009	0.71

5

Table 3: **Participation to Digit ratio measurement.** The table reports the marginal effects in the probit regressions, evaluated at the sample mean of the variable. All regressions include dummies for regions and industrial sector: the estimated coefficients for these are not reported for simplicity.

	(1)	(2)
	b/p	b/p
Male	–0.061**	–0.080***
	(0.031)	(0.008)
Age of entrepreneur	0.001	0.002
	(0.395)	(0.205)
Education of entrepreneur	0.010**	0.007*
	(0.011)	(0.074)
Height entr.	0.004**	0.004**
	(0.021)	(0.010)
First born entrepreneur	0.000	0.027
	(0.989)	(0.228)
Firm age		–0.001
		(0.155)
Years in control		–0.001
		(0.576)
Age of interviewer		0.005***
		(0.000)
Height of interviewer		0.006***
		(0.004)
Male interviewer		–0.071
		(0.107)
N	2246	1869

Table 4: **Determinants of Digit ratio.** The regressions include 19 regional dummies, not reported for simplicity.

	DR Right		Heckman	DR Left		Heckman
	(1)	(2)	(3)	(1)	(2)	(3)
	b/p	b/p	b/p	b/p	b/p	b/p
Main Equation						
Female	–0.003	–0.008**	–0.013***	–0.008***	–0.016***	–0.020***
	(0.288)	(0.039)	(0.009)	(0.006)	(0.000)	(0.000)
Height entr.		–0.000**	–0.001***		–0.001***	–0.001***
		(0.048)	(0.007)		(0.003)	(0.001)
First born entr.		–0.007**	–0.006*		–0.009***	–0.009***
		(0.023)	(0.061)		(0.002)	(0.006)
Selection Equation						
Female			0.174**			0.174**
			(0.028)			(0.028)
Height entr.			0.012***			0.012***
			(0.009)			(0.009)
First born entr.			0.027			0.027
			(0.641)			(0.641)
Age of interviewer			0.013***			0.013***
			(0.000)			(0.000)
Height of interviewer			0.018***			0.018***
			(0.001)			(0.001)
Male interviewer			–0.223**			–0.223**
			(0.047)			(0.047)
r2	0.043	0.050		0.029	0.043	
N	1313	1313	2129	1313	1313	2129
lambda			–0.048			–0.042
			(0.028)			(0.040)

Table 5: **Correlation among indices of women emancipation.** Four variables report the degree of agreement with the statements: (Housewife) "Being a housewife is a just as fulfilling as working for a pay", (Political) "On the whole, men make better political leaders than women do", (University) "A university education is more important for a boy than for a girl", (Executives) "On the whole, men make better business executives than women do". PC is the principal component of the first four variables, averaged across regions.

	Housewife	Political	University	Executives
Political	0.131	1		
	(0.0001)			
University	0.199	0.434	1	
	(0.0000)	(0.0000)		
Executives	0.166	0.619	0.499	1
	(0.0001)	(0.0000)	(0.0000)	
PC	0.356	0.812	0.767	0.850
	(0.0001)	(0.0000)	(0.0000)	

Table 6: **Fraction of female entrepreneurs and women emancipation.** The dependent variable is the fraction of female entrepreneurs. The coefficients reported are standardized (β coefficients). The variable South is equal to one if the entrepreneur is operating in the South of Italy.

	(1)	(2)	(3)	(4)
	beta/p	beta/p	beta/p	beta/p
Women emancipation: PC	0.437*	0.438*		
	(0.054)	(0.058)		
Women emancipation: BE			0.472**	0.470**
			(0.036)	(0.040)
South		–0.126		–0.114
		(0.568)		(0.597)
r2	0.191	0.207	0.223	0.236
N	20	20	20	20

Table 7: **Digit ratio, right hand, gender and women emancipation.** Columns 1 and 4 report OLS; Columns 2,3, 5 and 6 the Heckman regressions. WE is Women emancipation index, which can be BE (Men are better entrepreneurs) and PC (factor estimated in PC analysis).

	OLS	Heckman		OLS	Heckman	
	(1)	(2)	(3)	(4)	(5)	(6)
	b/p	b/p	b/p	b/p	b/p	b/p
Main Equation						
Female	–0.008**	–0.014***	–0.015***	–0.190*	–0.277***	–0.279***
	(0.035)	(0.007)	(0.005)	(0.062)	(0.005)	(0.004)
Female * WE (pc)	0.022*	0.036***	0.038***			
	(0.096)	(0.005)	(0.003)			
Female * WE (BE)				0.060*	0.087***	0.087***
				(0.074)	(0.007)	(0.006)
Female * South			0.006			0.002
			(0.430)			(0.829)
Height entr.	–0.000*	–0.001***	–0.001***	–0.000**	–0.001***	–0.001***
	(0.052)	(0.008)	(0.008)	(0.049)	(0.007)	(0.007)
First born entr.	–0.007**	–0.006*	–0.006*	–0.007**	–0.006*	–0.006*
	(0.023)	(0.060)	(0.061)	(0.025)	(0.064)	(0.065)
Selection Equation						
Female		0.197**	0.200**		3.307**	3.292**
		(0.014)	(0.022)		(0.035)	(0.036)
Female * WE (pc)		–0.486**	–0.490**			
		(0.012)	(0.013)			
Female * WE (BE)					–1.028**	–1.027**
					(0.046)	(0.046)
Female * South			–0.014			0.057
			(0.927)			(0.701)
Height entr.		0.012**	0.012**		0.012**	0.012**
		(0.012)	(0.012)		(0.010)	(0.011)
First born entr.		0.026	0.026		0.024	0.025
		(0.660)	(0.661)		(0.676)	(0.673)
Age of interviewer		0.013***	0.013***		0.013***	0.013***
		(0.000)	(0.000)		(0.000)	(0.000)
Height of interviewer		0.017***	0.017***		0.018***	0.017***
		(0.001)	(0.001)		(0.001)	(0.001)
Male interviewer		–0.223**	–0.223**		–0.227**	–0.226**
		(0.048)	(0.048)		(0.043)	(0.045)
N	1313	2129	2129	1313	2129	2129
Mill's ratio		–0.047	–0.047		–0.047	–0.047
		(0.031)	(0.031)		(0.031)	(0.031)

Table 8: **Digit ratio, left hand, gender and women emancipation.** Columns 1 and 4 report OLS; Columns 2,3, 5 and 6 the Heckman regressions. WE is Women emancipation index, which can be BE (Men are better entrepreneurs) and PC (factor estimated in PC analysis).

	OLS	Heckman		OLS	Heckman	
	(1)	(2)	(3)	(4)	(5)	(6)
	b/p	b/p	b/p	b/p	b/p	b/p
Main Equation						
Female	–0.016***	–0.021***	–0.023***	–0.185**	–0.261***	–0.266***
	(0.000)	(0.000)	(0.000)	(0.023)	(0.005)	(0.004)
Female * WE (PC)	0.019*	0.031***	0.034***			
	(0.074)	(0.010)	(0.005)			
Female * WE (BE)				0.056**	0.079***	0.080***
				(0.037)	(0.008)	(0.007)
Female * South			0.009			0.005
			(0.245)			(0.527)
Height entr.	–0.001***	–0.001***	–0.001***	–0.001***	–0.001***	–0.001***
	(0.003)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
First born entr.	–0.009***	–0.009***	–0.008***	–0.009***	–0.008***	–0.008***
	(0.002)	(0.006)	(0.006)	(0.002)	(0.006)	(0.006)
Selection Equation						
Female		0.197**	0.200**		3.307**	3.292**
		(0.014)	(0.022)		(0.035)	(0.036)
Female * WE (pc)		–0.486**	–0.490**			
		(0.012)	(0.013)			
Female * WE (BE)					–1.028**	–1.027**
					(0.046)	(0.046)
Female * South			–0.014			0.057
			(0.927)			(0.701)
Height entr.		0.012**	0.012**		0.012**	0.012**
		(0.012)	(0.012)		(0.010)	(0.011)
First born entr.		0.026	0.026		0.024	0.025
		(0.660)	(0.661)		(0.676)	(0.673)
Age of interviewer		0.013***	0.013***		0.013***	0.013***
		(0.000)	(0.000)		(0.000)	(0.000)
Height of interviewer		0.017***	0.017***		0.018***	0.017***
		(0.001)	(0.001)		(0.001)	(0.001)
Male interviewer		–0.223**	–0.223**		–0.227**	–0.226**
		(0.048)	(0.048)		(0.043)	(0.045)
N	1313	2129	2129	1313	2129	2129
Mill's ratio		–0.040	–0.040		–0.041	–0.040
		(0.05)	(0.05)		(0.047)	(0.049)

Table 9: **Size of the firm: employment and the effect of gender and WE.** The coefficients reported are standardized (β coefficients).

	(1)	(2)	(3)	(4)
	beta/p	beta/p	beta/p	beta/p
Digit ratio: right hand	–0.063**	–0.059	–0.054	–0.058
	(0.029)	(0.106)	(0.144)	(0.118)
Female	–0.068	0.029	0.084	0.040
	(0.141)	(0.959)	(0.880)	(0.941)
DR × Female		–0.097	–0.154	–0.113
		(0.863)	(0.781)	(0.834)
DR × Women Emanc.			0.707	0.796*
			(0.123)	(0.073)
DR × Female × WE				0.051
				(0.241)
Age of entrepreneur	–0.001	–0.000	–0.002	–0.003
	(0.982)	(0.989)	(0.962)	(0.921)
Education of entrepreneur	0.180***	0.179***	0.179***	0.180***
	(0.000)	(0.000)	(0.000)	(0.000)
Height entr.	–0.005	–0.006	–0.005	–0.004
	(0.908)	(0.903)	(0.917)	(0.927)
First born entr.	0.005	0.005	0.007	0.007
	(0.867)	(0.866)	(0.806)	(0.813)
Firm age	0.200***	0.200***	0.201***	0.199***
	(0.000)	(0.000)	(0.000)	(0.000)
Years in control	–0.013	–0.013	–0.012	–0.012
	(0.739)	(0.736)	(0.745)	(0.757)
Mill's ratios	0.097	0.098	0.097	0.098
	(0.264)	(0.259)	(0.266)	(0.260)
r2	0.171	0.171	0.173	0.174
N	1098	1098	1098	1098