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## **Who skims the cream of the Italian graduate crop? Wage-employment versus self-employment**

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# Who skims the cream of the Italian graduate crop?

## Wage-employment versus self-employment

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### **Abstract**

This paper tests whether the academic achievement is a significant determinant of the employment status in the Italian labor market: are the new entrepreneurs selected from the top or bottom end of the graduates ability distribution? Is the cream of the graduate crop pulled into self-employment by the higher expected earnings or are the individuals with lower degree score pushed into entrepreneurship by poor alternatives? Our data show a strong negative relation between academic achievement and self-employment status, i.e. we assess the skimming of the best graduates into wage and salary work.

**JEL - Classification:** J24, J31

## 1 Introduction

This paper tests whether the academic achievement is a significant determinant of the employment status: are the new entrepreneurs selected from the top or bottom end of the graduates ability distribution? Is the cream (the part that rises to the top) of the graduate crop pulled into self-employment by the higher expected earnings or are the individuals with lower degree score pushed into entrepreneurship by poor alternatives (Dennis (1996))?

Previous research on the empirical relation between education and entrepreneurship find an insignificant selection effect. A meta-analysis of 94 academic studies conducted by van der Sluis, van Praag, and Vijverberg (2003) measures the impact of schooling on self-employment and draws the conclusion that the effect of education on entrepreneurship is neither positive nor negative.<sup>1</sup>

In this paper we provide additional empirical evidence for the Italian labor market. In particular, our data show a strong negative relation between academic achievement and self-employment status, i. e. we assess the skimming of the best graduates into wage and salary work.

This paper has two advantages over previous research. First, in Italy self-employment represents a clear alternative to wage and salary employment because the share of self-employed workers over total employed is above 28 percent.<sup>2</sup> Moreover, the self-employment rate among graduate workers is about 26 percent, the highest rate in Europe and more than double the share in Denmark, France, Spain, Portugal, Sweden, Netherlands and Finland (Eurostat (2002)).

Second, our data allow to shift the focus of the relationship between schooling and employment status from the highest level of education completed to more specific measurements like as degree scores and completion speed by majors. To our knowledge, ability as measured by degree performance has rarely been used in previous analyzes of self-employment. As far as we know, only

Dolton and Makepeace (1990) consider degree class and A level score. They draw the conclusion that these variables have no significant role to play in their analysis.

## 2 Related Literature

We focus our analysis on two questions: 1) Why do some people choose self-employment over wage employment? 2) Why do the best Italian graduates prefer wage-employment? The theoretical literature on entrepreneurship argues that those who choose self-employment are all individuals for whom the use of their ability in entrepreneurial functions guarantees earnings higher than they would otherwise receive (Lucas (1978))<sup>3</sup>. Therefore people in self-employment are related to both entrepreneurial ability and outside options. Rees and Shah (1986) suggest that education enhances individual managerial ability and increases the probability of choosing self-employment because more educated workers tend to be better informed and more efficient at assessing entrepreneurial opportunities. However, this positive effect may be dominated by an opposite (negative) effect of education on entrepreneurship selection. In fact, higher educational performances might generate better outside options in paid employment, and thus depress the likelihood of self-employment as the preferred choice (de Wit (1993)).

As suggested by the referees, we produce separate gender specific estimates because several studies show that female and male entrepreneurs differ in many respects. For example, female entrepreneurs have been found to be more educated either in the U.K. (Cowling and Taylor (2001)) and in Italy (Eurostat (2007)).<sup>4</sup> Scherer, Brodzinski, and Wiebe (1990) report that males have a higher preference for entrepreneurship than females. Scott (1986) finds that women choose entrepreneurship in order to achieve a balance between career and personal life/family. Buttner and Moore (1997) highlight the desire of women to pursue entrepreneurship because they experience gender related

barriers to their career advancement in paid employment.

Our data show that the degree score is higher for employees than it is for the self-employed (both for males and females). This preference of the best graduates towards paid work may be due either to the attractiveness of a career prospect<sup>5</sup> or to the attractiveness of employment protection.<sup>6</sup>

The debate on the European labor market regulation has emphasized the negative effect of employment protection legislation on the firms' firing costs (Schettkat (1997)). In contrast, the results presented here highlight a positive effect deriving to firms from the stability of the employment relationship: it induces job-seekers to compete for vacancies, so that firms can apply selection criteria to screen the best of them (Clotfelter (1996)).

Thus the employment protection legislation may have two consequences on self-employment. First, it may make self-employment an attractive option for low-ability graduates who have failed to pass firms' selection processes, particularly if employers attempt to circumvent the negative effect of employment protection legislation by contracting-out work to self-employed contractors (OECD (1999)).<sup>7</sup> Second, our data show that job protection may induce the best graduates to prefer dependent employment, dissuading the "cream of the crop" from taking up other options as the self-employment status.

### 3 Data and Methodology

#### Data

Our data are derived from the Survey on Labor Market Transitions of University Graduates carried out in 2004 by the Italian National Statistical Office. The Survey is the result of interviewing Italians who graduated from university in 2001 three years after graduation. The retrospective information gathered allows us to analyze both academic performance (final degree grades) and initial entry into the labor market.<sup>8</sup> The data contain information on the educational curriculum, the occupational status, the student's family

background and personal characteristics.

In particular, the principal variables contained in the data set can be divided into the following five main groups. (i) *University Career and High School Background*: including, kind of high school attended, high school mark, other education, university, subject, duration, degree score, accommodation, work during university, post graduate studies, (ii) *Work Experience*: including, experience in actual work, experience, type of work, net monthly wage, (iii) *Work Search*: including, kind of work desired, willingness to work abroad, preference over time table, minimum net monthly wage required, (iv) *Family Information*: including, parents' work, parents' education level, brothers and/or sisters, (v) *Personal Characteristics*: including, date of birth, sex, marital status, children, country of domicile, country of birth, residence.

Following much of the existing empirical literature, the sample used in this study was constructed in the following way. We exclude individuals that work in the sector of primary production, in line with Rees and Shah (1986), Johansson (2000) and van der Sluis, van Praag, and Vijverberg (2003). We omit individuals who graduated in the field of medicine as their career path is very different from that of other graduates.<sup>9</sup> Finally, the sample consists of full-time workers only.<sup>10</sup> We end up with a sample of 9902 individuals of which 5203 are male and 4699 are female. For men, 1065 are self-employed and 4138 employees, a sample self-employment rate of about 20%. For women, 643 are self-employed and 4056 employees, a sample self-employment rate of about 14%. Table 1 provides descriptive statistics for the sample used.

Figure 1 shows the empirical distribution of earnings for self-employed and employees.<sup>11</sup> We observe that the distribution of self-employment earnings exhibits greater dispersion and is more skewed than the employees distribution for both males and females.

Further evidence of the differences in self-employment and employee net monthly earnings distributions is shown in tables 1 and 2. We observe that

while male self-employed earn more on average than employees do, female self-employed earn less. The standard deviation of the income of the self-employed is also two times higher than for the employees for both males and females. Table 2 shows the distribution of the net monthly earning by job status. Both table 2 and figure 1 are consistent with the view that the self-employment typically is a more risky option because the increased changes of higher earnings are balanced to some extent by the increased changes of low earnings.

There is now clear evidence in the literature that self-employed workers have more variable and unequal incomes than employees do (Parker, Belghitar, and Barmby (2005)). As an example, all the studies on the distribution of self-employment income explored by Parker (1997) show that the self-employed are over-represented in both the upper and lower tails of the overall income distribution. However, we observe that in our sample two opposite grounds may explain the self-employed income distribution. From one side we consider only graduate workers. Indeed, the education may reduce the variation in the self-employment earning as stressed by Rees and Shah (1986). From the other side we take into account a first entry in the job market, i.e. the earnings are sampled at an early stage of the graduate's career. In particular, this sampling may thicken the left tail of the self-employed earning distribution where low earnings may merely reflect the initial costs of establishing a business.

In the following, we attempt to show the influence of the individual ability on the choice to become self-employed. To this end, we measure the unobservable ability by means of the degree performance. The degree performance takes into account both the final degree mark and the speed<sup>12</sup> at which students complete their academic career. Both information are gathered in what we call the "educational performance": *edperf*.

$$edperf = \frac{dscore}{1 + 0.10 \times years} \quad (1)$$

where *dscore* is the degree mark plus the laude or highest honors when it occurs. The number of years in excess (*years*) used to get the degree is eventually corrected for those having carried out military service during university years. Obviously, the degree scores have been normalized to take into account the different marking scale for each faculty.<sup>13</sup>

Figure 2 shows the cumulative distribution functions of the educational performance (*edperf*) for employee and self-employed graduates. Our data clearly show a first order stochastic dominance of employees with respect to self-employed.<sup>14</sup> Hence, when we only consider the effect of the academic achievement on the self-employed status we find a clear and strong negative relation for both males and females. In the following, we investigate whether this relation holds also when we control for other variables as individual characteristics (for instance family background) and the potential earning obtained from working in each sector.

### Methodology

We investigate the effect of the educational performance on the choice between self-employment and paid-employment by means of the model of Rees and Shah (1986) and similar to the models estimated by Dolton and Makepeace (1990), Bernhardt (1994), Taylor (1996) and Johansson (2000). The motivation of the model, which is a standard selection model of the employment status decision, is that the self-employed have a comparative advantage of working in that sector. An individual chooses to work in the self-employed sector if his utility is higher than in the paid-employed sector. Formally, an individual  $i$  will choose to be self-employed if:

$$U_i^{se} - U_i^e \equiv \alpha_0(\ln(Y_i^{se}) - \ln(Y_i^e)) + \alpha_1 X_i + \epsilon_i > 0$$

where the superscripts *se* and *e* refer to the self-employment and employed sector, respectively. The difference in utility obtained in each sector, i.e. the choice of sector, depends on non-pecuniary factors such as social background,

risk attitudes, family responsibilities and education (the variables included in  $X$ ),<sup>15</sup> and on the earnings differential in the two sectors,  $Y^{se}$  and  $Y^e$ , respectively. Because the earnings of an individual is only observed in the sector which he or she works, a sample selection problem may arise. This problem is overcome by estimating earnings equations for the self-employed and the paid employed augmented with the appropriate sample selection corrections (Table 4). In particular, the self-employed (employees) have a comparative advantage in their chosen employment status if the estimated coefficient for the selection effect in the earnings equation is negative (positive). (See Rees and Shah (1986)).

Hence, we first estimate a reduced form probit model (Table 5) for the choice of being self-employed and then we make use of this estimation result to eventually correct the earning regression estimation for the sample selection (Heckman (1979) two-step procedure). Last, we estimate the structural form probit (Table 5) which includes as regressors also the difference in the natural logarithm of the earnings in the two sectors,  $(\ln(Y_i^{se}) - \ln(Y_i^e))$ .

The structural probit equation is identified by means of variables that appear in the structural probit but not in the earnings equations. These variables should affect the choice to become self-employed/employees but not earnings.<sup>16</sup> We identify the structural probit by omitting the dummy variable *Children* from the earnings equations. In fact, while there is no reason to expect that being married should affect earnings, the number of children has been found in several studies,<sup>17</sup> to be correlated with being self-employed.

At the same time, the identification of the structural probit equation relies also on the exclusion of variables which affect the selection decision only through the earnings equations. Following Dolton and Makepeace (1990) and Johansson (2000) we drop from the structural probit equation the education level dummies of the individual, i.e. the dummy *Qualification* which assumes a value of 1 whether the graduate workers has attempted further qualifica-

tion after graduation. We therefore assume that the education level dummies of the individual affects the choice to be self-employed or not through earnings effects only. Further, we exclude from the structural probit equation the dummy variable *Work Experience* which indicates whether the individual has started his actual work before the graduation or, more in general, was working before he graduated.

## 4 Results

Rees and Shah (1986) and Dolton and Makepeace (1990) find no statistically significant role for the predicted earnings differential in the estimates of the self-employment decision. In contrast with these results, our data suggest that the earnings distribution provides incentives to be self-employed (for both males and females) in line with the findings of Fujii and Hawley (1991), Bernhardt (1994), Taylor (1996), Johansson (2000) and Georgellis and Wall (2005). The coefficient of the predicted earnings difference used in the structural probit model is positive and significant (see table 5). This implies that the more the predicted self-employment (employees) earnings exceed the predicted employees (self-employed) earnings for a given individual, the more likely that individual is to be self-employed (employee).

We turn now to analyze the influence of the direct effect of ability (as measured by the educational performance) on the entrepreneurial choice. Dolton and Makepeace (1990) find that ability, measured by A-level and degree performance, has no significant role to play. In contrast with this result, we find that the educational performance raises the likelihood to become employee (row 2 of the structural probit equation in table 5), that is we find evidence that high ability graduates (both males and females) are drawn to wage-employment by something other than better earnings. This may be due to the attractiveness of employment protection legislation on young graduates. This result is not surprising for young women assessing high Italian standards of employment

protection as maternity and parental leaves. Conversely, this result may not be taken as granted for male graduates. Our interpretation is reinforced by the empirical evidence on the transition between self-employed and employees in the Italian labor market. Rosti and Chelli (2005) show that subordinate employment is perceived by woman as a place of arrival from which they rarely move. This suggests that female self-employment is more transitory than male self-employment as shown also by Cowling and Taylor (2001) for the U.K. labor market.

Further, we observe that the educational performance has a positive and significant impact only on the employees earnings (row 3 of table 4) for both males and females.<sup>18</sup> This result seems to be consistent with the presence of a signalling effect of the best graduates in wage-employment. Moreover, our empirical results offer some support for the strong screening hypothesis (SSH) which states that schooling is merely a signal of the productivity for employers. A widely used test to verify the screening hypothesis is to compare the returns to educational performance for the self-employed (the unscreened control group) and employees (the screened group). The idea is that self-employed have no need to signal inherent ability and therefore any return they make to education represent a true return to human capital investments. If it turns out that the returns to educational performance for the self-employed are insignificant and the returns to educational performance are significantly positive for employees this would give support for the SSH (see Brown and Sessions (1998), Brown and Sessions (1999), Castagnetti, Chelli, and Rosti (2005), García-Mainar and Montuenga-Gómez (2005) and Brown and Sessions (2006)).

Table 4 show the estimation results for the earnings' equation in both alternative employment status. Both equations are corrected for possible sample selection bias.

The sample selection terms,  $\lambda$ , obtained from the reduced form pro-

bit, show that there is a positive (negative) selection bias for the observed earnings in self-employment (wage employment) of both genders. This means that earnings of those who choose wage employment are significantly lower than earnings they would have obtained as self-employed. Although the caution of Dolton and Makepeace (1987a) who show that no unambiguous interpretation can be placed on the sign of a sample selection term, this evidence may confirm our belief that individuals prefer a job entitled with full rights to social security to self-employed.

Last, turning to the structural probit equation, we observe that the family size variable (*Children*) is significant in explaining the choice to become self-employed. The presence of children reduces the incidence of self-employment for both men and women. This is consistent with the desire to reduce the riskiness of ones income (as shown in fig. 1) by seeking out employment in the waged sector. Conversely, Dolton and Makepeace (1987b) and Taylor (1996) find that children positively influence the probability of female self-employment due to the need to balance work and child care commitments. Cowling and Taylor (2001) suggest that the rigidity of waged employment in terms of fixed hours and contractual obligations is less suited to mothers of young children, but in Italy job protection results much more attractive than the flexibility of self-employment.

## 5 Conclusion

The strong empirical evidence that employees exhibit higher educational performance than self-employed led us to check the robustness of this fact and to investigate the causes of the entrepreneurial choice.

A graduate individual will choose wage employment instead of self-employment when the benefit expected from pursuing a career as employee is higher than that of becoming an entrepreneur. Monetary earnings are one of the most important benefit of employment but the choice of a career also depends on

preferences and personal attitudes such as specific abilities. As an individual's earnings are only observed in the sector in which he works, sample selection problems may arise. Following Rees and Shah (1986) and Dolton and Makepeace (1990) we separate the direct effect of ability on the entrepreneurial choice from the indirect effect of this characteristic through the expected earnings differential.

Our data show that both relative income and ability have a positive role on the choice between self-employment and wage employment. In particular, the probability of being an employee depends positively on the educational performance. While we expect this result for young women because of the high benefits of maternity in wage employment, we surprisingly find the same evidence for males. That is, a steady job entitled with full rights to social security (insurance for sickness and unemployment periods) could be more attractive for young males than an entrepreneurial career.

We draw the conclusion that firms can skim the cream of the Italian graduate crop and reject low ability individuals pushing them into self-employment, even if they would have otherwise preferred to work as employees. As a consequence, policies based on increasing the returns from self-employment are unlikely to encourage the best graduates to become self-employed at the beginning of their careers. However, the nature of our data set means that these results have to be treated with caution. The graduates are only a short way into their careers and they could change the choice between wage employment and self-employment several times during their life work.

## Notes

<sup>1</sup> For example, Blanchflower (2004) shows that in Europe the probabilities of being self-employed are lower the more educated an individual is, while the opposite is true in the US. In Italy, as in the U.S., the probability of being

self-employed is higher for tertiary educated persons (Eurostat (2007)).

<sup>2</sup>In Italy the self-employment rate is three times higher than in Denmark and more than double the share in France, Germany, Sweden, Netherlands, Austria and Finland (Eurostat (2005)).

<sup>3</sup>A recent theory formalized in Lazear (2004) and Lazear (2005) posits that an individual who is innately well versed in a variety of fields, i. e. a Jack-of-All-Trades, has a high probability of becoming entrepreneur. Consistent evidence that a balanced skill-mix causally stimulates entrepreneurship is given in Wagner (2003) on German data. On the contrary, Silva (2006) on Italian data shows that gathering expertise across various subjects does not increase the chances of becoming entrepreneur.

<sup>4</sup>Cowling, Taylor, and Mitchell (2004) also find substantive differences in job creating capability across gender and education that we cannot verify with our data set.

<sup>5</sup>A referee suggests this hypothesis, that we cannot neither confirm nor reject because our data refers to individuals with a very short career advancement (three years after graduation).

<sup>6</sup>Traditionally, the Italian standard work contracts have been characterized by high degree of employment protection, mostly against dismissals. According to the OECD (1999)'s Employment Outlook, Italy ranked first in terms of strictness of the regulation of permanent contracts during the 1990's.

<sup>7</sup>Robson (2003) finds only very limited evidence to support the hypothesis that stricter employment protection legislation promotes self-employment in OECD countries.

<sup>8</sup>The graduate population of 2001 consisted of 155.664 individuals (67.913 males and 87.751 females). The ISTAT survey was stratified on the basis

of degree course taken, University attended and by the sex of the individual student. The response rate was about 67.6%, yielding a data-set containing information on 26.006 graduates.

<sup>9</sup>After having obtained their degree in medicine, in general the students carry out a specialist activity which lasts at least three years.

<sup>10</sup>Due to missing data we can't reliably build the *hourly wage* variable. That's why we restrict the sample to full-time workers only as Dolton and Makepeace (1990), Rees and Shah (1986) and Johansson (2000). Following Rees and Shah (1986) we define the full-time workers as those who worked more than 30 hours per week.

<sup>11</sup>The estimate is based on a normal kernel function.

<sup>12</sup>In the Italian education system, each faculty only sets a minimum number of years in which to obtain a degree. A consequence is that there is a high dispersion in the age at which students graduate. The speed of completion of the academic career is, therefore, together with the final mark, an important component of the educational performance.

<sup>13</sup>The final degree score ranges from 66 to 110 (for some Universities the maximum mark awarded is 100). According to each faculty internal ruling a *laude* (distinction) may be assigned to candidates with a 110/110 mark for recognition of the excellence of their thesis (in this analysis the 110 *cum laude* was transformed to 113).

<sup>14</sup>First-order stochastic dominance is a possible ordering between two stochastic distributions. Let  $F(x)$  and  $M(x)$  denote the cumulative distribution functions of the educational performance  $x$  for female and male students, respectively.  $F$  first-order stochastically dominates  $M$  if and only if for every possible educational performance  $x$ ,  $F(x) \leq M(x)$ . This means that for every possible value of  $x$ , the probability of getting an educational performance that high is

never better in M than in F.

<sup>15</sup>See Dolton and Makepeace (1990).

<sup>16</sup>These variables should be uncorrelated with the error terms of the earnings equation but have a strong effect on selectivity. See Johansson (2000).

<sup>17</sup>See, for instance Rees and Shah (1986) and Taylor (1996).

<sup>18</sup>This result is in line with the findings of Dolton and Makepeace (1990), Fujii and Hawley (1991), Taylor (1996) and Johansson (2000).

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Table 1: **Descriptive Statistics**

<b>Males</b>	Employees		Self-employed	
	Mean	Standard deviation	Mean	Standard deviation
Edperf	83.408	17.171	80.798	16.901
ln earnings	7.182	0.237	7.210	0.459
Father self-employed	0.233		0.372	
Industrial Sector	0.361		0.139	
Qualification	0.012		0.004	
Work Experience	0.607		0.642	

<b>Females</b>	Employees		Self-employed	
	Mean	Standard deviation	Mean	Standard deviation
Edperf	84.386	17.909	82.722	17.992
ln earnings	7.003	0.265	6.963	0.462
Father self-employed	0.277		0.372	
Industrial Sector	0.177		0.075	
Qualification	0.011		0.009	
Work Experience	0.669		0.633	

**Industrial Sector:** A dummy taking the value of 1 if the graduate is working in the industrial sector.

**Work Experience:** A dummy taking the value of 1 if the graduate either was working during the university or has started the actual work before graduating.

**Qualification:** A dummy taking the value of 1 if the graduate has obtained a post-graduated certificate of education.

Table 2: **Relative frequency distribution of net monthly earnings by job status**

	<b>Males</b>		<b>Females</b>	
	self-employed	employees	self-employed	employees
450	0.18%	0.05%	0.96%	0.25%
600	5.68%	0.23%	12.86%	3.60%
800	7.01%	0.73%	13.02%	5.51%
1000	18.72%	12.27%	26.37%	26.91%
1400	26.26%	57.26%	22.19%	53.15%
1600	17.39%	16.67%	11.58%	6.94%
1700	1.60%	2.56%	1.13%	1.04%
1900	3.02%	3.59%	1.77%	1.02%
2300	11.36%	4.87%	7.07%	1.14%
2500	4.79%	0.85%	1.45%	0.32%
2700	0.35%	0.23%	0.64%	0.00%
3300	3.64%	0.71%	0.96%	0.12%

Table 3: Structural Form Probit Equations for the Wage Employment/Self Employment Decision. (1=Self Employed, 0=Employee)

Variable	Males		Females	
	Coefficient	T-ratio	Coefficient	T-ratio
Constant	0.102	0.20	2.098	4.39
Edperf	-0.005	-2.65	-0.005	-2.41
<i>Subject (omitted group = Health)</i>				
Sciences	-0.306	-1.08	-2.099	-5.58
Natural sciences	0.433	1.55	-1.374	-5.04
Engineering	0.072	0.28	-1.397	-5.17
Architecture	1.224	4.52	-0.642	-2.22
Agricultural studies	0.243	0.84	-0.625	-2.18
Economics, Business and Statistics	0.037	0.14	-1.533	-5.89
Political Science and Sociology	-0.096	-0.35	-1.081	-3.94
Law	0.599	2.21	-0.336	-1.30
Humanities	0.434	1.48	-1.024	-3.90
Foreign languages	-0.031	-0.09	-1.958	-6.92
Teachers college	-0.098	-0.29	-1.423	-5.26
Psychology	-0.080	-0.25	-1.379	-4.41
Previously attending a different degree type	0.198	2.30	-0.288	-2.74
Studied in the same town of residence	-0.164	-2.82	-0.146	-1.96
Moved in a different town to attend the university	-0.106	-1.41	-0.281	-3.01
Father Degree	0.161	2.56	0.281	3.19
Mother Degree				
Married	-0.007	-0.11	0.115	1.49
Father self-employed	0.423	7.61	0.050	0.74
Mother self-employed	0.048	0.57	0.166	1.70
Industrial Sector				
Qualification				
Work Experience				
Children	-0.210	-2.14	-0.333	-2.92
Log earnings differential	2.383	28.40	4.024	24.58
observations	5203		4699	
Percent Correctly Predicted:	85.97		90.38	
McFadden's pseudo R-square	0.34		0.39	

Each regression includes controls for college and region of residence. The estimates parameters of these dummies are not reported.

Table 4: Estimates of the Earnings Equations for the Employees and Self Employed

	Males			Females		
	Employees	Self-employed	T-ratio	Employees	Self-employed	T-ratio
Constant	7.402	6.802	112.54	7.105	5.788	122.05
Lambda	-0.101	-0.456	-1.67	-0.104	-0.325	-1.68
Edperf	0.001	-0.001	3.01	0.001	0.001	4.25
<i>Subject (omitted group = Health)</i>						
Sciences	-0.045	-0.661	-0.94	0.066	0.213	2.10
Natural sciences	-0.046	-0.509	-1.02	0.048	0.473	1.44
Engineering	0.039	-0.374	0.93	0.194	0.676	5.72
Architecture	0.006	-0.009	0.09	0.001	0.656	0.01
Agricultural studies	-0.110	-0.254	-2.37	-0.023	0.350	-0.56
Economics, Business and Statistics	-0.021	-0.500	-0.50	0.081	0.272	2.88
Political Science and Sociology	-0.023	-0.372	-0.51	-0.003	0.128	-0.10
Law	-0.035	-0.298	-0.82	0.028	0.321	0.77
Humanities	-0.099	-0.529	-2.10	-0.070	0.131	-2.40
Foreign languages	-0.116	-0.443	-2.18	-0.034	0.406	-1.11
Teachers college	-0.180	-0.561	-3.53	-0.063	0.106	-2.16
Psychology	-0.145	-0.182	-2.78	-0.106	0.329	-2.60
Previously attending a different degree type	0.047	-0.034	3.55	0.043	0.120	3.29
Studied in the same town of residence	-0.008	-0.054	-0.82	0.004	-0.011	0.43
Moved in a different town to attend the university	0.026	-0.002	2.20	0.020	0.074	1.65
Father Degree	0.022	0.154	1.67	0.011	-0.039	0.83
Mother Degree	-0.005	-0.063	-0.39	0.012	0.071	-1.60
Married	0.068	0.110	7.26	0.010	0.013	0.80
Father self-employed	0.050	0.169	3.77	0.016	0.089	1.17
Mother self-employed	-0.001	0.023	-0.05	0.016	0.065	1.63
Industrial Sector	0.012	-0.177	0.73	0.012	-0.144	1.08
Qualification	0.072	-0.101	1.75	-0.088	0.335	-1.46
Work Experience observations	0.018	0.079	2.12	0.024	0.032	-0.70
R2	4138	1065		4056	643	
		0.19		0.12	0.19	

Each regression includes controls for college and region of residence. The estimates parameters of these dummies are not reported.

Table 5: Reduced Form Probit Equations for the Wage Employment/Self Employment Decision. (1=Self Employed, 0=Employee)

Variable	Males		Females	
	Coefficient	T-ratio	Coefficient	T-ratio
Constant	-1.206	-3.03	-2.418	-4.70
Edperf	-0.005	-3.83	0.000	-0.15
<i>Subject (omitted group = Health)</i>				
Sciences	-1.192	-5.44	-0.637	-2.50
Natural sciences	-0.307	-1.45	0.463	2.18
Engineering	-0.469	-2.46	0.552	2.62
Architecture	0.976	4.69	1.563	6.90
Agricultural studies	0.064	0.29	0.777	3.38
Economics, Business and Statistics	-0.715	-3.71	-0.334	-1.64
Political Science and Sociology	-0.598	-2.97	-0.272	-1.27
Law	0.003	0.01	0.737	3.65
Humanities	-0.352	-1.59	-0.070	-0.34
Foreign languages	-0.430	-1.58	-0.056	-0.26
Teachers college	-0.696	-2.8	-0.435	-2.04
Psychology	-0.139	-0.56	0.495	2.11
Previously attending a different degree type	0.040	0.57	0.060	0.70
Studied in the same town of residence	-0.169	-3.35	-0.156	-2.55
Moved in a different town to attend the university	-0.075	-1.17	-0.044	-0.58
Father Degree	0.293	4.72	0.046	0.59
Mother Degree	-0.059	-0.8	0.138	1.58
Married	0.055	0.97	0.109	1.81
Father self-employed	0.406	8.13	0.202	3.51
Mother self-employed	0.070	0.9	0.233	2.74
Industrial Sector	-0.706	-12.39	-0.723	-8.16
Qualification	-0.445	-1.5	0.034	0.13
Work Experience	0.026	0.54	-0.039	-0.70
Children	-0.120	-1.38	-0.348	-3.75
Log earnings differential				
observations	5203		4699	
Percent Correctly Predicted:	82.01		87.76	
McFadden's pseudo R-square	0.2		0.21	

Each regression includes controls for college and region of residence. The estimates parameters of these dummies are not reported.

Figure 1: Empirical distribution of earnings for employees and self-employed

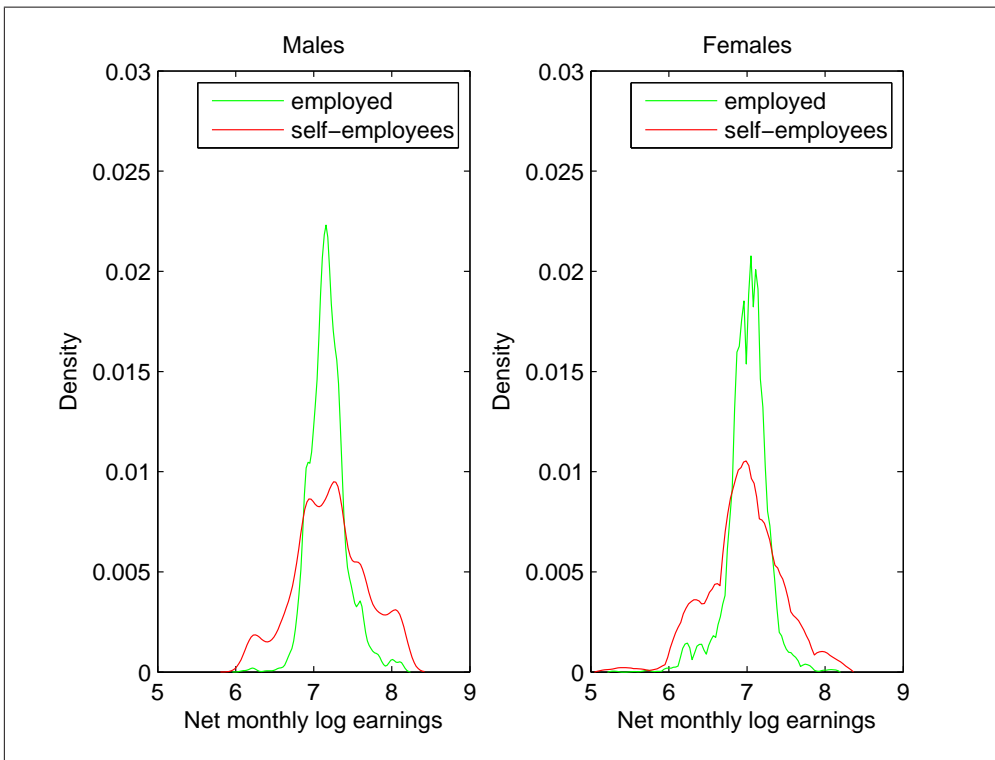


Figure 2: Cumulative distribution functions of the educational performance for employees and self-employed

