The decision to become an entrepreneur in Spain: The role of the household financial situation

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Abstract

This paper analyses how self-employed (entrepreneurs) and employed workers earnings differ in Spain. We develop an empirical analysis on the factors that determine income and the factors that determine the effects on the financial situation of the families of entrepreneurs versus salaried families. We use the "Encuesta Financiera de las Familias" database corresponding to 2011. Our results show that salaried workers earn more than the self-employed workers. Furthermore, pessimism and familiar patrimony play a key role in the entrepreneur decision.

Keywords: Entrepreneurship; Household financial situation, Wages; Self-employment;

JEL Codes: D11, J24, J31.

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1. Introduction

Entrepreneurship is a common potential labour alternative to salaried employment at a global level. Theoretical and empirical studies of entrepreneurship and self-employment are common fields in economic literature. In the case of Spain, the country studied in this paper, Cueto *et al.* (2015) find that in some regions unemployment and self-employment move in opposite directions; however, in other regions they move in the same direction. It is due to the so-called "entrepreneurial spirit" of individuals. If this entrepreneurial spirit is strong in a certain region, then people will find self-employment an attractive alternative to salaried employment and they might use it as refuge from unemployment. On the contrary, if the entrepreneurial spirit is not strong in a region, increases in unemployment will not be followed by increases in self-employment.

Following along the same line of research, Congregado, Golpe and Carmona (2010) analyse the relationship between unemployment and entrepreneurship and find that during economic crises unemployment incentivizes self-employment. Moreover, during expansion periods, few successful self-employed workers leave self-employment because they cannot find better labour conditions. On the other hand, Congregado, Esteve and Golpe (2012) find evidence that, while the level of salaried employment has varied substantially during the present economic crisis, the level of self-employment has not, this is a different pattern than the one from the 1991-1993 crisis, where the level of self-employment was not stable.

Gimenez-Nadal, Molina and Ortega (2012) analyse the relationships between self-employment and time used in household chores. They show how self-employment offers individuals more flexible hours. Thus, mothers can structure their market work time and childcare time in a more efficient way. In this familial context, Molina (2015) reviews the recent theoretical and empirical contributions to homework, and their relation to the equilibrium between family and labour activities. García *et al.* (2011) give international evidence on the differences between genders regarding time devoted to work and childcare, and Giménez and Molina (2014) create a labour framework to analyse the relationships between time use decisions, gender and labour, and regional unemployment rates for Spain.

Carrasco, Albarrán and Martínez-Granado (2009) study inequality between salaried and self-employed workers. They show that salaried workers' wages are significantly higher than the earnings of their self-employed counterparts. Besides, Castro and Santero (2014) find empirical evidence on the importance of educational level, labour stability and experience as gender entrepreneur determinants. At an international level, Hamilton (2000) studies earnings differences between private-sector salaried workers and self-employed workers. It is shown that the financial profits of salaried workers, and their rate of growth, are 35% higher than those of self-employed workers.

The present paper has the objective of developing a similar analysis to the one by Hamilton (2000), in a microeconomic perspective and for Spain, with current data. Moreover, Spain has been strongly affected by the economic crisis and the unemployment rate has suffered greatly from its effects. Thus, individuals may have incentives to find income from other sources than salaried jobs, i.e., people have incentives to become an entrepreneur, in line with what was reported by Congregado, Golpe and Carmona (2010) and Cueto *et al.* (2015). However, it is possible that the expectations of those considering self-employment, a job without supervision, without a boss, without rigid schedules, will be truncated by the reality of a crisis-affected labour market in the sense that the expected earnings cannot be obtained unless entrepreneurs devote not only high temporal and capital investments or managerial inputs, but also use other concepts such as innovation. We cannot forget the effect of other types of variables: laws, taxes and others that are derived from the former, including evasion and fraud; although, data about tax variables is not included. In this context, Molina and Montuenga (2009) provide evidence specific to Spain regarding the significant salaried penalization for maternity as a consequence of not only economic situation there, but also the legal situation.

We use the theoretical framework of Blau (1985) and Taiwo (2010) as benchmark, which states that self-employment outcomes are characterized by a production function whose inputs are capital investment, time devoted and individual managerial abilities. We regard technical abilities as being important as well. Individual managerial abilities refers to the capability of successfully running a business, which will be taken into account as labour experience, while technical abilities involve technical knowledge, i.e. the individual's level of education. Empirical evidence on the importance of these factors for European countries can be found in García *et al.* (2010). This paper proposes an adaptation of the theoretical model created by Blau (1985) for self-employment in a household *á la Chiappori* background, which can be solved according to the second theorem of welfare economics. Using the micro-data collected in the "Encuesta Financiera de las Familias" (EFF) from 2011, we propose an empirical model for analysing factors that are supposed to affect earnings for both employed and self-employed workers (entrepreneurs), and we also analyse the differences between both groups of workers in Spain. Furthermore, we will analyse how the household financial situation is related to the decision to become an entrepreneur, i.e., being self-employed *versus* being an employed worker.

Our data, collected in the Bank of Spain's 2011 EFF, are a cross-section, and our empirical modelling has been conditioned to this fact. On the one hand, we use a linear OLS estimation model to analyse the factors that explain earnings for the employed and the self-employed workers. On the other hand, we will use binary Maximum Likelihood estimation regression models, both Logit and Probit, to analyse the effect of the household financial situation on entrepreneurs. Inherit consequences of cross-sectional analyses are unobserved heterogeneity and double causality, we will show that the former will play an important role in the self-employment outcomes models, where non-

controllable factors (according to our database) may strongly affect self-employed earnings, in contrast to employed wages. The latter restriction is unavoidable due to the lack of a temporal trend in our data, and thus we cannot talk about directions of the relationships found.

Our empirical results show how salaried workers' wages are higher than self-employed workers and entrepreneurs' earnings. Furthermore, factors that traditionally determine wages in a significant way do not have the same effect in the case of self-employment outcomes. We also find that debts do not have impact on entrepreneurs; however, pessimism derived from unemployment does, discouraging entrepreneurship. Household assets (vehicles, estate and stocks) and the financial security that they provide also affect entrepreneurship, by encouraging people to become entrepreneurs. A need for income derived from high average household expenses affects entrepreneurship in a negative way.

Our contribution to the literature on self-employment is threshold. We first pose a theoretical model of self-employment household, based on a utility maximization in *à la Chiappori* background where not only time devoted to work and time invested are considered as self-employment outcomes determinants, but also the technical and managerial abilities of the individuals. Second, we use financial microeconomic data to analyse self-employment, which is not common in this field. Data derived from the Spanish EFF from the year 2011 provides us with information to study the effects of the financial situation of families with income coming from entrepreneurship and self-employment, which leads us to distinguish between self-employed and salaried families. Our data also lets us to differentiate between entrepreneurs and self-employed individuals, a difficult issue due to their conceptual similarities [1].

The rest of the paper is organized as follows. We propose the theoretical model in section 2. Section 3 presents our data and variables while section 4 details our microeconometric analysis. Finally, we present the conclusions of our study in section 5.

2. Household approach to the Blau (1985) model

Household approach microeconomic theoretical models of utility maximization have known advantages when compared to a unitary approach. This kind of modelling was created in the work of Nobel Prize winner (1992) Gary Becker. He studied the efficiency improvements in household formation derived from cohabitation. Our new household approach takes Blau (1985) and Taiwo (2010) unitary models as

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[1] We must propose an alternative definition of entrepreneur than the one of given by the GEM. We define entrepreneurs as those self-employed individuals whose business has been active for up to eight years in order to have a big enough sample.

benchmarks. We are going to propose an analogous perspective to the one used by P.A. Chiappori, who named this kind of household model. Household models *à la Chiappori* are themselves an important current field of research in microeconomics (Chiappori, 1992; Bargain and Donni, 2011; Donni and Matteazzi, 2010 or Cherchye, De Rock and Vermeulen, 2010)

In the Blau (1985) model, individuals maximize their utility function (whose inputs are leisure and consumption) individually, subjected to both budgetary and temporal restrictions. As we have mentioned above, self-employment outcomes are characterized by an income-production function with capital, temporal and managerial inputs. Individuals can control the time devoted to self-employment and capital investment, but not personal abilities, which are fixed for each individual.

When jumping to a household approach, we suppose that households are formed by two individuals *i*=1,2, i.e., our households will be couples. The difference is that it is the household itself, and not the individuals, who maximize utility. Thus, we can write the maximization utility function as follows:

$$\mu \times U_1(\boldsymbol{G}_1, S_1) + (1 - \mu) \times U_2(\boldsymbol{G}_2, S_2),$$

where $U_i(\boldsymbol{G}_i, S_i)$ is utility of i, in function of consumption, $\boldsymbol{G}_i$, and leisure time, S_i. Parameter $\mu \equiv \mu(w_i + Q_i, d)$ defines the household bargaining power of $i = 1$ (so $1 - \mu$ is the one of individual $i = 2$) as a function of individual earnings, $w_i + Q_i$, and socio-demographic characteristics, d. We define w_i as private-sector wage and Q_i as self-employment earnings of individual i.

Let E be total household worth and T be total disposable time (which must be divided between leisure, salaried work, H_i, and self-employment, N_i). We take w_i as exogenous. Now, we characterize self-employment as Blau (1985) and Taiwo (2010) did, but add technical abilities to the production function inputs. Let this function be $Q_i \equiv Q_i(K_i, N_i, M_i)$ where Q_i is output, K_i is capital invest and M_i reflects personal (*managerial* and *technical*) abilities. Q_i follows the common productivity function hypothesis. Then, temporal and budgetary constraints can be respectively written as:

$$H_i + N_i + S_i = T, \qquad i = 1,2$$
$$G_1 + G_2 + K_1 + K_2 = E + w(H_1 + H_2) + Q_1 + Q_2$$

Note that there is a temporal restriction for each individual because there is no conceptual or analytical reasoning behind defining a household temporal restriction. However, there is a unique budgetary constraint that depends not only on individual earnings and working times, but also on household income.

In this background, individuals have control over *H*, *N* and *K* (note that as far as *T* is fixed, by controlling *H* and *N*, *S=T–H–N* is immediately determined). Thus, the maximization problem can be solved by using the second theorem of welfare economics. According to this theorem, the problem is analogous to a two-step process.

In the first step an intra-familiar negotiation process is carried out and individuals arrive at an agreement regarding household income distribution: $E = E_1 + E_2$. In the second step, individuals maximize their utilities independently, under a traditional temporal constraint and a new budgetary constraint that depends upon the negotiation process of the previous step:

$$\text{For } i = 1,2, \quad \text{Max:} \quad U_i = U_i(G_i, S_i)$$
$$\text{Subject to:} \quad H_i + S_i = T$$
$$G_i + K_i = E_i + wH_i + Q_i$$

3. Data and variables

The Bank of Spain's "Encuesta Financiera de las Familias" (EFF), is a survey of the "Plan Estadístico Nacional". It has been developed every three years, since 2002, for individuals of each socio-economic stratum in order to obtain a complete representation. Its objective is to offer direct information about the economic and financial situations of Spanish families. Such information complements aggregated data collected in the financial accounts ("Cuentas Financieras") of the Spanish economy. More information can be found in http://www.bde.es/bde/es/areas/estadis/Otras_estadistic/Encuesta_Financi/. We will use cross-sectional data collected in this survey for both the household and the head of household for the year 2011. The importance of these data is in its nature. They include financial and economic variables, such as wages, earnings, labour contracts, self-employment outcomes, debts, value of business, value of household worth, mortgages, benefits, scholarships, loans, assets…, and also personal social variables such as age, education level or nationality. This kind of data has been underused in labour economics, particularly in self-employment analyses. We keep the following variables: "self-employed" (determines when an individual is self-employed), "self-employed, main" (when an individual's main job is self-employment), "salaried" (when an individual is employed in a salaried position), "salaried, main" (when an individual's main job is salaried), "entrepreneur" (when an individual is an entrepreneur), "wage", "self-employment earnings", "total earnings" (each is measured in Euros, the latter is the sum of the two former), "salaried work time", "self-employed work time", "work time" (each is measured in hours per week; the latter is measured as the sum of the two former), "household income", "household expenses" (measured in average Euros per month), "home ownership" (when a family owns the home they live in, versus renting it), "age", "age^2/100", "family size", "living as a couple", "good health" (self-reported by individuals in EFF), "education level" (we distinguish between basic, secondary and university education), "age of business" (for self-employed workers), "experience, private sector" (for salaried workers), "long-term contract", "full-time contract" (for salaried workers), "mortgages" (aggregating the present value of all outstanding

mortgages in the household, measured in Euros), "household vehicles value" (aggregating the present value of all household vehicles, measured in Euros), "household estate value" (aggregating the present value of all household estates, measured in Euros), "other property value" (jewellery, art...), "debts" (aggregating the present value of all household debts, except mortgages, measured in Euros) and "assets" (aggregating the present value of all household assets, measured in Euros).

Developing a cross-sectional analysis comes with two inherent consequences: unobserved heterogeneity and double causality. The former refers to the differences in the explained variable that are not explained for in observable variables. We will show that this is going to play an important role in the self-employment outcomes models, where non-controllable factors (according to the database) may strongly affect self-employed worker's earnings, in contrast with the wages of their employed counterparts. The latter restriction is unavoidable as far as there is not a temporal trend in our data, which means that we only find relationships between variables, but not their causal direction. However, cross-sectional analyses derived from surveys are common in microeconomics. On the one hand, surveys offer impartial data; on the other hand, panel data surveys are very rare.

We eliminate those families whose head of household is retired or unemployed, and retain a sample of 2,501 individuals (of whom 1,724 are salaried workers and 842 are self-employed workers). A statistical summary of our variables, by gender and by labour status, is shown in Table 1. We have defined zero earnings for those individuals that are self-employed and do not have any profit from his/her business. It is apparent that on average men present higher earnings than women. In fact, this pattern is true for both salaried (+1,400€) and self-employed (+600€) families. Moreover, those who are employed receive significantly higher earnings than those who are self-employed (+2,000€ for men and +1,000€ for women). Regarding time devoted to work, we find that, in fact, self-employment is not related to less market work time. On the contrary, self-employed men and women devote on average 3 weekly hours more to their jobs than their counterparts. Men also devote on average more time to market work than women, +6 hours and +5.5 hours every week for employed and self-employed men, respectively. This is directly related to the so-called Household-Responsibilities Hypothesis. This hypothesis says that women devote more time to childcare and household activities. Thus, mothers will devote less time to other activities, such as market work. Concerning our new definition of entrepreneurs, we consider that 24% (35%) of self-employed men (women) are entrepreneurs.

Let's note that employed and self-employed individuals do not necessarily have a single employment. If we observe the number of individuals in our sample and the number of employed and self-employed workers, we find that some of them must by necessity combine both types of labour status. 8.2% (5.6%) of self-employed men (women) in our sample are also salaried workers, and 5.3% (1.4%) of the employed men (women) also have their own business. Furthermore, only 1% (0.7%) of the

salaried men (women) in our sample are entrepreneurs. This can mean that in an expansive economic situation, salaried workers may look to increase their earnings through entrepreneurship, but not during an economic crisis. For the predictive analyses, we will define total earnings and total market work time.

Earnings densities are shown in Figure 1. We can appreciate a strong presence of null or almost null declared earnings self-employed individuals (remember that those individuals that reported self-employment loss have been coded as zero earnings). These individuals are an important part of our analysis (85.6% of the self-employed workers from the sample declare zero or negative self-employment earnings and 78.7% of the self-employed declare zero or negative total earnings) and we do not consider eliminating them an option due to that they reflect an important part of our sample and, thus, the reality of self-employment in Spain. Although salaried workers also present a density concentrated around low values, the mean is significantly higher than that of self-employed workers, as we mentioned above.

Figure 2 shows the relationship between weekly market work time and earnings for self-employed and salaried workers, which shows a notably positive relationship for the latter. The reasoning behind this result is clear: the higher the wage, the more time workers are able to work, and conversely, the more time worked, the higher the earnings received for this work. However, there is no such clear relationship for self-employed individuals. One limitation of these analyses is that we are adjusting with a linear trend and there can be no linear relationships. Nevertheless, we cannot affirm that temporal input has a key role determining self-employment outcomes according to our sample, in Spain.

Figure 3 shows the relationships between total earnings, total time devoted to work weekly and educational level, for both salaried and self-employed workers. We can see the relationship between a high educational level and the higher earnings in the employed workforce, although there is not a clear relationship with market work time. Regarding the self-employed workforce, we can see how education and earnings do not seem to be related, but the higher the educational level, the lower the market work time. Figure 4 shows relationships between experience and earnings. For salaried workers, we can take their experience directly from the EFF; for self-employed individuals, we approximate it based on the age of their business. Although it seems that earnings increase slightly with experience for salaried workers, we cannot conclude that there is a positive relationship for either those who are employed or for those self-employed. Thus, we do not find clear evidence, in the case of Spain, on the importance of technical and managerial abilities as inputs for the self-employment production function. Moreover, the temporal input seems to not have a determinant role either.

4. Econometric analysis

4.1 Empirical strategy

We propose two empirical models, one for the earnings analysis and another for the study of the household financial situation and entrepreneurs. The former, which we decide to call "earning model", is proposed as a linear regression model whose parameters will be estimated by Ordinary Least Squares, OLS. We regress earnings for salaried workers, self-employed workers and entrepreneurs from a series of variables. These variables are work-related variables (experience, market work time and type of contract, for salaried workers), educational variables, household variables (living as a couple, family size, ownership of the home, monthly expenses and debts), personal variables (age, gender and health) and labour status variables (we want to compare self-employed workers and entrepreneurs with salaried workers), as is shown in Table 2. Estimates of these parameters will be interpreted as the average variation of earnings between individuals, according to their labour status (e.g., for salaried workers, the self-employed parameter reflects the earnings differences, not measured by the rest of the variables, between an individual who only works in a salaried position and an individual who also is self-employed). We also include age squared to measure the presence of non-linear relationships.

We have noted above the strong presence of individuals with null earnings. Therefore, the use of linear regression models is preferable to censored regression models, such as the Tobit Model. However, the use of OLS linear models is justified and common in microeconometric literature (Gimenez-Nadal and Molina, 2015a, 2015b; Frazis and Stewart, 2012; Foster and Kalenkoski, 2013).

The second model we propose refers to the household financial situation, and we have called it "self-employment model". We intend to show the relationships between some financial variables, such as value of assets, household properties or debts, and being self-employed or salaried. Thus, we could conclude that the factors that are positively related to self-employment are factors that favour or are favoured by entrepreneurs. In doing so, we pose two binary models, Logit and Probit. Since both models behave similarly, we expect that they will offer robust estimates compared with the other in the sense that meaningfulness and sign of coefficients do not vary from one to another. The dependent variable of these models is thus the dummy variable "self-employed", because we want to compare the financial situation of salaried and self-employed families. We include not only financial variables in the model (mortgages, vehicle value, estate value, other property value, debts and assets), but also personal (gender, age, age squared and health), household (expenses, living as a couple and family size), labour (time worked, experience and being unemployed in 2010) and education (using basic education level) variables. We use the weights collected in the EFF for both the Earnings and the Self-employment model.

We can write the earnings models as follows:

$$W_i = \beta_0 + \beta_1 SE_i + \boldsymbol{\beta_2 X_i} + \varepsilon_i,$$
$$W_i = \alpha_0 + \alpha_1 AS_i + \boldsymbol{\alpha_2 Y_i} + \epsilon_i,$$

where W is the earnings of salaried and self-employed workers (entrepreneurs), respectively, SE is the dummy "self-employed", AS is the dummy "salaried", X and Y are the rest of dependent variables for the salaried and the self-employed workers, respectively, and ε and ϵ are standard robust error terms. We expect to find that $\beta_1 < 0$ and $\alpha_1 > 0$ are both meaningful, according to the idea that salaried workers earn more than self-employed individuals. We also expect to find that the relationship is the same for entrepreneurs.

On the other hand, self-employed binary models can be written as:

$$SE_i = \delta_0 + \delta_1 \boldsymbol{Z_{1i}} + \delta_2 \boldsymbol{Z_{2i}} + \delta_3 \boldsymbol{Z_{3i}} + u_i,$$

where $\boldsymbol{Z_1}$ are personal, familiar, labour and education variables, $\boldsymbol{Z_2}$ are debts and $\boldsymbol{Z_3}$ is different property value; u is the standard robust error term. Coefficients have to be interpreted as the change in the probability of being self-employed (for salaried workers) when the corresponding dependent variable increases by a unit. We expect that $\boldsymbol{Z_2} < 0$ and $\boldsymbol{Z_3} > 0$, i.e., high wellness value will incentivise individuals to become entrepreneurs and high debts will discourage them.

4.2 Results

Table 3 shows the results of the earnings models. Columns 1 and 3 are restricted to individuals who work as salaried or employed workers (not necessarily as a main job). Column 2 is restricted to individuals who are self-employed and Column 4 to individuals who are entrepreneurs (again, not necessarily as their main job). We can see how, for salaried workers, self-employment implies on average a meaningful loss in earnings (-656€/month), but not if we restrict the comparison to salaried individuals and entrepreneurs. On the other hand, all the self-employed workers, entrepreneurs or not, who also work as salaried workers experience on average a meaningful increase in earnings (+1295€/month for those who are self-employed and +1080€/month for entrepreneurs).

It is also shown that market work time is significantly related to earnings but only for salaried workers. The greater the amount of market work time, the higher their monthly salaried earnings, and vice versa. For self-employed workers and entrepreneurs, this relationship is not meaningful. This could mean that, while salaried workers are encouraged to work more time for a higher wage, or that they receive higher earnings by working more hours; these patterns are not true for self-employment, neither for entrepreneurs, nor for self-employed non-entrepreneurs. Moreover, family

size has a negative relationship with earnings for salaried workers, but not for self-employed workers and entrepreneurs.

We find that educational level and experience are not related to self-employment outcomes, which surprises us. Thus, we do not find evidence, in this Spanish case study, of the importance of the hypothesis Blau (1985) describes about managerial abilities, measured as experience. Nor do we find evidence of the importance of technical abilities (measured as education level). However, we can conclude with certainty that personal, familial and socio-demographic factors that are usually related to earnings are also meaningful in the case of Spanish salaried workers, but not for self-employed workers or for entrepreneurs. Only monthly expenses show a positive relationship with self-employment outcomes, but only for self-employed workers in general, not for entrepreneurs. We should now address the previously mentioned importance of unobservable heterogeneity, i.e., factors that data is not available for (e.g., laws, taxes, evasion, differentiation between firm owner, employer or freelance worker, type of business, ideas behind business, innovation…). If we look at the R^2 of the models, we can see how it is higher for Columns 1 and 3, reflecting that models of self-employment and entrepreneurship are more poorly adjusted than the ones for the salaried workers. Other variables that might affect self-employment are individual expectations and entrepreneurial spirit. Dawson et al. (2015) say that pessimism and realism imply success for self-employment because they do not raise expectations too high, but optimistic entrepreneurs do and then it is more difficult for them to reach those expectations.

Table 4 displays the self-employment models' estimates. Columns 1 and 2 refer to Probit models and Columns 3 and 4 to Logit models. We get qualitatively similar results for both cases, so results do not depend on the statistical model chosen. Furthermore, we have eliminated non-meaningful variables of Columns 1 and 3 in Columns 2 and 4. Variables retain their meaning and relationships do not vary. Across household, personal and labour variables, we can see how market work time is positively related to self-employment, so the more time that is devoted to work, the more possibility of becoming self-employed, and/or vice-versa. Age is also, quadratic and positively, related to the probability of becoming self-employed. The pattern regarding the case of education variables is as follows: if we control for basic education level, a secondary education level is positively related with salaried employment. A university education level does not have a meaningful relationship with self-employment or salaried employment. Health, gender, living as a couple and family size do not affect the probability of being a self-employed or a salaried worker. Regarding financial factors, it is shown that mortgages and debts are not related to the probability of becoming self-employed; therefore, they do not affect entrepreneurs. Although, having been unemployed during the previous year is negatively related with self-employment. On the other hand, estate, vehicle and assets value are positively related with the probability of being self-employed.

5. Conclusions

This paper analyses the differences between salaried and self-employed earnings, not only quantitative differences, but also the factors that determine them. We also study how household financial situations are related to entrepreneurial activity. To do so, we use the Bank of Spain's "Encuesta Financiera de las Familias", EFF, from 2011. Our main objective is to empirically study self-employment in Spain, and examine the idea of it being a potential labour alternative to being an employee, with some advantages, such as better schedules.

Our empirical results show that salaried workers get significantly higher earnings than their self-employed counterparts. Furthermore, the average work time of self-employed individuals is also notably higher than that of employed workers. In addition, we find evidence of the importance of the usual factors that determine wages, but these variables are not related to self-employment outcomes. Moreover, R^2 statistics appear to indicate that unobservable heterogeneity, possibly variables related to legal issues or a sense of calling, have a strong effect on self-employment income. We also find that debts and mortgages are not particularly related to self-employment, in comparison with salaried employment, but to have been unemployed discourages entrepreneurship and a good household financial situation encourages it. This leads us to conclude that entrepreneurship, and therefore self-employment, is not an activity exclusively derived from needs, but also from entrepreneurial spirit, desire and innovation.

A strong limitation of our analysis comes from the nature of the data used, as it sets a cross-section, we cannot determine causes and effects, we can only find relationships between variables. In our case, it is not at all clear what the causal relationships involved are. Financial situation may determine entrepreneurial activity, or maybe being self-employed, in comparison to being an employee, is what determines the household financial situation. Another limitation is the unobservable component that we have mentioned above.

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Table 1. Descriptive analysis

Variables	Male					Female				
	Self-employed		Salaried		*P*-value (diff)	Self-employed		Salaried		*P*-value (diff)
	Mean	E.D.	Mean	E.D.		Mean	E.D.	Mean	E.D.	
Self-employed (main)	.9037	.2951	.0144	.1194	(<0.01)	.9096	.2875	.0043	.0659	(<0.01)
Salaried (main)	.0616	.2407	.9652	.1831	(<0.01)	.0451	.2083	.9752	.1554	(<0.01)
Salaried	.0827	.2756	1	0	(<0.01)	.0564	.2315	1	0	(<0.01)
Self-employed	1	0	.0530	.2242	(<0.01)	1	0	.0145	.1198	(<0.01)
Entrepreneur	.2496	.4331	.0144	.1194	(<0.01)	.3502	.4784	.0072	.0859	(<0.01)
Self-employment earnings	1029.7	4117.6	46.07	725.7	(<0.01)	412.03	1642.1	1.778	46.62	(<0.01)
Wage	247.82	1035.8	3029.7	4394.1	(<0.01)	64.11	354.34	1591.6	1227.9	(<0.01)
Total earnings	1277.5	4246.9	3075.8	4459.6	(<0.01)	476.18	1667.5	1593.4	1227.7	. (<0.01)
Household income	17430	44847	7906.5	29789	(<0.01)	14867	63919	4576.9	5547.6	(<0.01)
Household expenses	2433.2	3796.8	1561.2	1269.3	(<0.01)	1884.1	2452.0	1247.0	905.05	(<0.01)
Home Ownership	.9593	.1975	.9189	.2729	(<0.01)	.8983	.3031	.8791	.3261	(0.443)
Age	55.24	10.99	49.13	10.15	(<0.01)	51.82	10.92	46.70	9.619	(<0.01)
Age^2/100	31.72	12.14	25.17	9.837	(<0.01)	28.04	11.55	22.73	8.903	(<0.01)
Family size	3.198	1.334	3.145	1.260	(0.450)	2.915	1.300	2.895	1.236	(0.815)
Living as a couple	.8330	.3731	.7849	.4110	(<0.01)	.6214	.4863	.5254	.4997	(0.020)
Good health	.8090	.3933	.8746	.3312	(<0.01)	.8135	.3905	.8602	.3469	(0.113)
Basic education	.1909	.3933	.1494	.3567	(0.054)	.1920	.3950	.1382	.3454	(0.068)
Sec. education	.3203	.4669	.4445	.4971	(<0.01)	.3898	.4890	.4643	.4990	(0.072)
Univ. education	.4872	.5002	.4011	.4903	(<0.01)	.4124	.4936	.3930	.4887	(0.637)
Age of business	18.75	13.08	-	-	-	16.44	14.58	-	-	-
Experience (p.s.)	1.908	.3890	17.39	12.31	(<0.01)	.6610	.2411	12.74	10.89	(<0.01)
Long-term contract	-	-	.8833	.2311	-	-	-	.8034	.3976	-
Full-time contract	-	-	.9324	.2510	-	-	-	.7423	.4376	-
Self-employment working hours	43.25	16.82	1.314	6.729	(<0.01)	37.81	19.57	.3595	3.345	(<0.01)

|										
Salaried working hours	2.357	8.982	40.13	10.12	(<0.01)	1.276	5.690	34.18	10.63	(<0.01)
Total working hours	45.61	16.33	41.45	10.53	(<0.01)	39.09	19.40	34.54	10.70	(<0.01)
Mortgages	10150	50396	4943	10546	(<0.01)	4793.2	10094	4977.9	24089	(0.911)
Household vehicles value	2714.5	8808.3	1359.6	2189.4	(<0.01)	1437.0	2237.3	906.01	1454.4	(<0.01)
Household estate value	173703	515277	55884	110650	(<0.01)	94087	166910	41111	126153	(<0.01)
Other property value	4433.0	20359	1017.2	7474.1	(<0.01)	1437.3	4659.5	505.49	4330.9	(0.011)
Debts	18113	311605	1620.5	17517	(0.092)	2334.8	12022	525.58	3351.5	(<0.01)
Assets	79739	2757656	443076	3152419	(0.013)	402989	2132587	68646	292650	(<0.01)
N. obs.	665		1037			177		687		

Note: the sample (EFF 2011) is restricted to families whose head of Household is a salaried worker or self-employed. Monetary variables are measured in Euros and temporal variables in hours per week. We show in parentheses t-test p-values of the differences between salaried and self-employed workers.

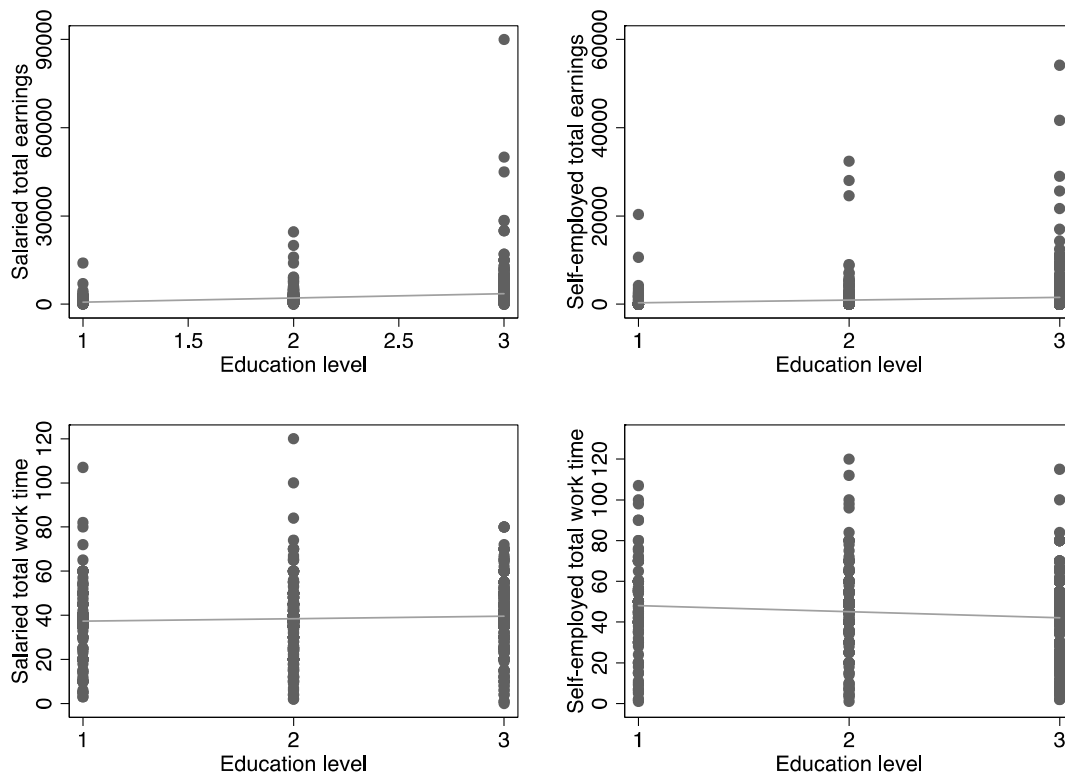Figure 1. Densities of earnings
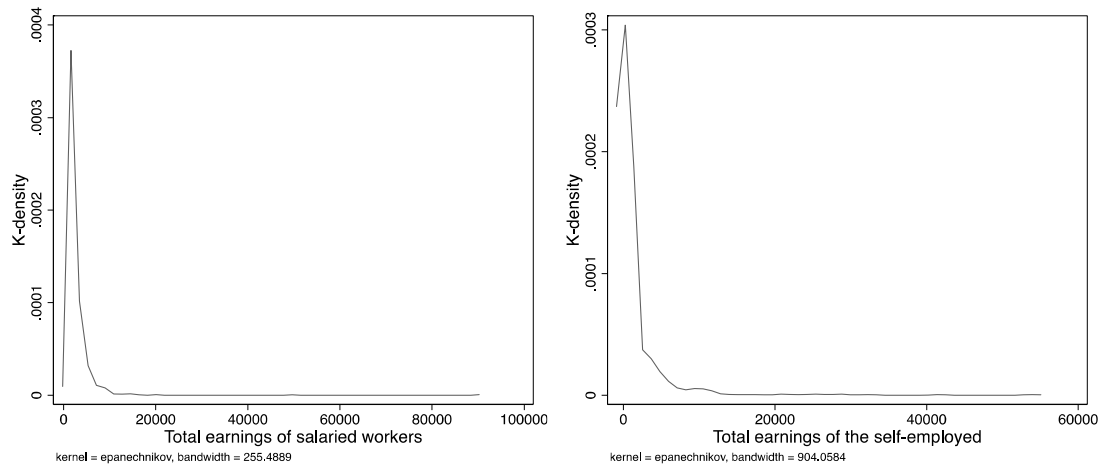
Note: the sample (EFF 2011) is restricted to salaried and self-employed workers, respectively. Earnings are measured in Euros.

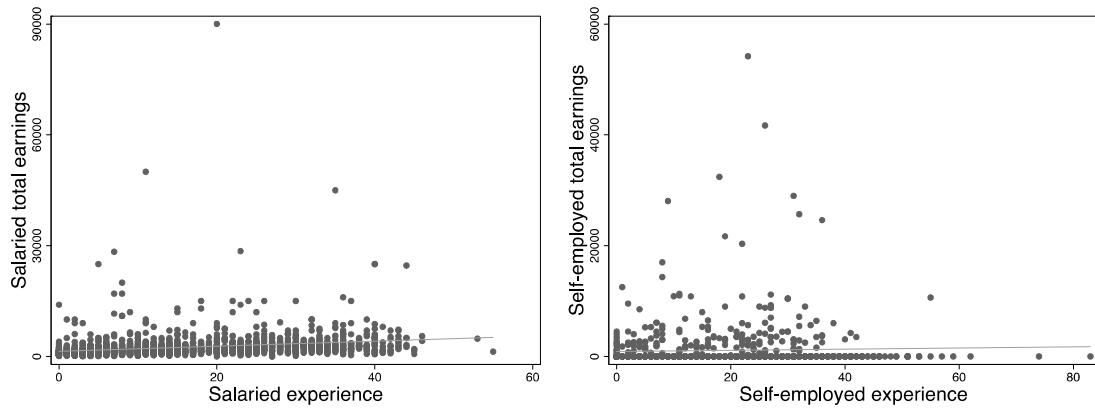Figure 2. Relationship between weekly market work time and earnings
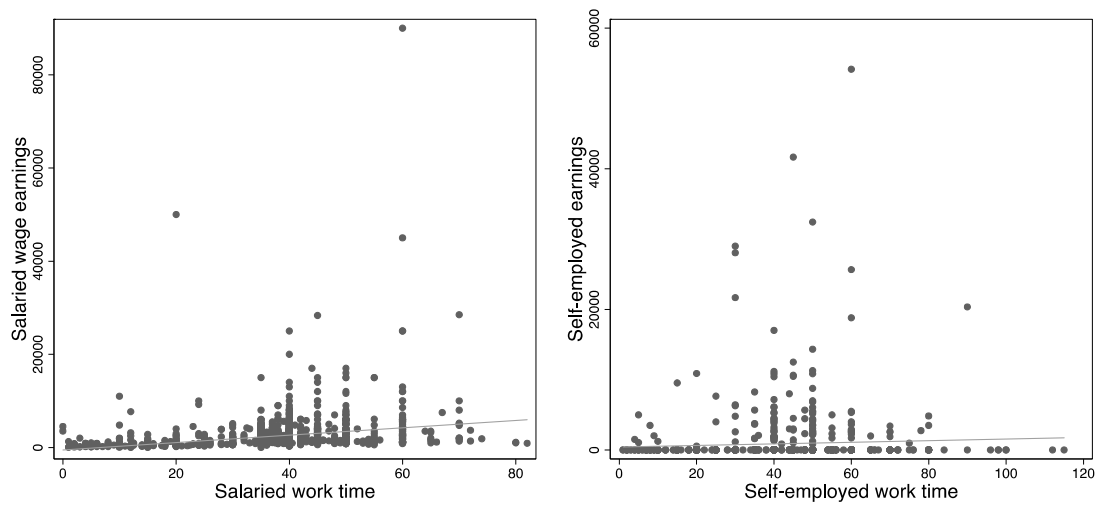
Note: the sample (EFF 2011) is restricted to salaried and self-employed workers, respectively. Earnings are measured in Euros and weekly market work time in hours.

Figure 3. Relationships between earnings, education level and market work time

Note: the sample (EFF 2011) is restricted to salaried and self-employed workers, respectively. Earnings are measured in Euros and weekly market work time in hours. The education level takes the values 1 (basic education), 2 (secondary education) and 3 (university education).

Figure 4. Relationship between earnings and experience

Note: the sample (EFF 2011) is restricted to salaried and self-employed workers, respectively. Earnings are measured in Euros. Experience is measured in years (for self-employed workers, we take the age of the business as a proxy of the self-employed individuals experience).

Table 3. Earning models

VARIABLES	(1) Salaried	(2) Self-employed	(3) Salaried	(4) Entrepreneur
Self-employed	-659.456**			
	(305.214)			
Entrepreneur			-462.420	
			(285.932)	
Salaried		1,295.558***		1,080.694***
		(302.154)		(494.228)
Working hours	24.667***	4.709	21.980***	-1.818
	(9.267)	(6.818)	(8.970)	(7.067)
Male	509.114***	-117.346	510.129***	-292.789
	(70.859)	(273.505)	(70.993)	(461.778)
Age	12.796	18.160	14.197	32.367
	(28.650)	(37.798)	(28.686)	(56.857)
Age^2/100	-18.869	-19.188	-20.426	-33.717
	(32.552)	(33.214)	(32.539)	(60.782)
Good health	-243.912	94.847	-246.322	176.335
	(230.074)	(125.483)	(232.024)	(193.775)
Home ownership	-118.408	123.383	-132.682	377.743
	(199.143)	(183.979)	(198.144)	(285.886)
Debts	0.006	-0.001	0.006	-0.002
	(0.006)	(0.000)	(0.006)	(0.001)
Living as a couple	70.766	-35.461	67.163	-512.774
	(78.823)	(111.840)	(78.674)	(349.113)
Family size	-149.251***	-20.495	-146.877***	170.755*
	(40.186)	(81.070)	(40.250)	(102.359)
Monthly expenses	746.675***	660.066**	744.532***	840.823
	(143.793)	(259.883)	(143.131)	(619.441)
Sec. education	157.291*	-28.331	158.609*	6.128
	(89.085)	(126.153)	(89.088)	(202.109)
Univ. education	1,097.100***	156.624	1,092.037***	208.946
	(141.638)	(204.091)	(140.146)	(273.281)
Experience (p.s.)	21.059***		20.509***	
	(4.829)		(4.987)	
Full-time contract	205.148		268.145	
	(179.770)		(172.034)	
Long-term contract	257.303***		271.468***	
	(90.179)		(91.742)	
Age of business		5.092		82.614*
		(8.626)		(43.878)
Intercept	-760.962	-1,160.756	-741.023	-1,908.313
	(484.416)	(860.462)	(483.706)	(1,468.911)
Observations	1,724	842	1,724	228
R-squared	0.415	0.200	0.413	0.264

Note: the dependent variable is "total earnings". Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The sample (EFF 2011) is restricted to salaried individuals (columns 1, 3), self-employed workers (column 2) and entrepreneurs (column 4). Monetary variables are measured in Euros and temporal variables in hours per week. We control the education level by individuals with basic education.

Table 4. Self-employment model

VARIABLES	(1) Probit (1)	(2) Probit (2)	(5) Logit (1)	(6) Logit (2)
Working hours	0.030***	0.030***	0.052***	0.030***
	(0.006)	(0.006)	(0.013)	(0.006)
Male	0.181	0.185	0.212	0.185
	(0.142)	(0.142)	(0.258)	(0.142)
Age	-0.149**	-0.149**	-0.176	-0.149**
	(0.065)	(0.065)	(0.109)	(0.065)
Age^2/100	0.207***	0.209***	0.264**	0.209***
	(0.071)	(0.071)	(0.121)	(0.071)
Good health	-0.061	-0.059	0.105	-0.059
	(0.217)	(0.216)	(0.392)	(0.216)
Living as a couple	0.039	0.036	0.033	0.036
	(0.150)	(0.149)	(0.282)	(0.149)
Family size	0.035	0.033	0.088	0.033
	(0.065)	(0.065)	(0.118)	(0.065)
Sec. education	-0.434**	-0.437**	-0.789**	-0.437**
	(0.193)	(0.196)	(0.332)	(0.196)
Univ. education	-0.180	-0.187	-0.399	-0.187
	(0.209)	(0.210)	(0.369)	(0.210)
Experience (p.s.)	-0.149***	-0.149***	-0.379***	-0.149***
	(0.020)	(0.020)	(0.068)	(0.020)
Unemployed in 2010	-0.944***	-0.944***	-1.974***	-0.944***
	(0.255)	(0.256)	(0.544)	(0.256)
Monthly expenses	0.170*	0.169**	0.187	0.169**
	(0.087)	(0.086)	(0.193)	(0.086)
Mortgages	-0.057		-0.048	
	(0.070)		(0.132)	
Household vehicles value	0.793*	0.809*	1.828*	0.809*
	(0.468)	(0.470)	(1.050)	(0.470)
Household estate value	0.044**	0.042**	0.118*	0.042**
	(0.021)	(0.017)	(0.067)	(0.017)
Other property value	0.144		0.624	
	(0.431)		(0.800)	
Debts	0.174		0.358	
	(0.131)		(0.415)	
Assets	0.000	0.001	0.002	0.001
	(0.001)	(0.001)	(0.002)	(0.001)
Intercept	0.891	0.856	-0.036	0.856
	(1.417)	(1.419)	(2.366)	(1.419)
Observations	2,501	2,501	2,501	2,501

Note: the dependent variable is the dummy variable "self-employed". Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The sample (EFF 2011) is restricted to families whose head of Household is a salaried or a self-employed worker. Monetary variables are measured in Euros and temporal values in hours per week. We control the education level by individuals with basic education.