

Transitions to and from Self-Employment in Spain: An Empirical Analysis

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Abstract

This paper investigates the influence of individual characteristics and the business cycle on the probability of entry into self-employment and on self-employment duration. We estimate multinomial logit and discrete competing risks models using data from a longitudinal sample of Spanish men for the period 1985-1991. The results indicate that unemployment rises the probability of entering self-employment, but also increases the hazard of leaving self-employment, specially into unemployment. Moreover, receiving unemployment benefits significantly reduces the probability of entering self-employment. Liquidity constraints are important in determining entrepreneurial selection, but only for those who become self-employed with employees.

1 Introduction

Over recent years, self-employment has been receiving a great deal of attention, both from the point of view of labour market policy and academic research. Part of the reason for this is that self-employment has been growing in several countries since the mid-1970 after a long period of decline that dates back to at least the late 1940's. In Spain (and in many OECD countries) self-employment expanded faster than overall, non-agricultural employment during the period 1979-90: 12.7% of the workforce was self-employed in 1979 while this figure increased to 18.5% in 1990, according to the Spanish Labour Force Survey. But perhaps the most important reason for this renewed interest follows from the fact that self-employment has begun to be considered as an important source of new jobs and an alternative to paid employment. Therefore, it widens the choice facing both the potential entrants to the labour market and the unemployed. In fact, in many countries self-employment growth has been stimulated by supportive policies, including schemes to help the unemployed to set up in business and help in obtaining the financial resources and skills.¹

The purpose of this paper is to study the factors influencing the decision of entry into self-employment and the likelihood of remaining in business, using longitudinal data from the Spanish Continuous Family Expenditure Survey (ECPF) for 1985.I-1991.IV. In particular, we are interested in estimating the effect of being unemployed on the probability of starting a business and on self-employment duration. We also analyze the effect of capital

¹According to OECD data, the largest schemes are in France, the United Kingdom and Spain. They are generally targeted to unemployed people who have already received benefits for a certain length of time, but sometimes also to people under risk of losing their jobs. They may provide either periodic payments, which may be higher than the corresponding unemployment benefits, or a lump-sum capitalization of unemployment benefits.

and unemployment benefits on the probability of transition. Moreover, we are concerned about capturing differences in the probabilities of switching into self-employment with and without employees and about distinguishing exit from self-employment into employment from exit into unemployment, controlling for personal characteristics and business cycle effects.

While recent studies have improved our empirical knowledge of the role of small business in the economy, data limitations have forced these studies to leave out dynamic aspects of entrepreneurship. Many of these studies follow Rees and Shah (1986)² who estimated a static model on the basis of cross-sectional data. However, as pointed out by Evans and Leighton (1989), the cross-sectional estimates confound the determinants of switching and survival. The longitudinal data used in this paper permit a closer examination of some key aspects of entrepreneurship. These data allow us to observe transitions into self-employment and to determine the length of time an individual has operated his business. This will enable us to assess whether unemployed individuals are more prone to become self-employed than paid-employed workers, how long they stay self-employed and what they do afterwards. As a result, we hope to know to what extent individuals use self-employment as a step to other forms of employment. In addition, the panel structure of our data allows us to construct durations for individuals entering self-employment, avoiding stock sample biases, and permits us to analyze a wide cycle of the Spanish economy.

From previous studies we know that the failure to find a job contributes to explain self-employment growth. There is some evidence from Evans and Leighton (1989) that men who are unemployed are more likely to enter self-employment. In this paper we also obtain similar evidence for Spain. Fur-

²See, for example, Blanchflower and Oswald (1991a), Meyer (1990b) and Taylor (1996).

thermore, we investigate the effect of unemployment benefits on the probability of entering self-employment, obtaining a strong negative effect. This reinforces the previous finding that suggests that the self-employed are poor workers and misfits for paid work. However, as regards the self-employment duration, our results show that previous unemployment experience increases the probability of leaving self-employment.³

The impact of liquidity constraints on the decision of becoming an entrepreneur has been also largely examined. Using US or UK micro data, Evans and Leighton (1989), Evans and Jovanovic (1989) and Blanchflower and Oswald (1991a) conclude that imperfect credit markets constrain entrepreneurs. Our empirical findings agree with these results, but we have found that liquidity constraints only affect significantly the probability of becoming self-employed with employees.

Another interesting issue is the role of macro-economic effects, particularly the unemployment rate, on determining self-employment transitions. Evans and Leighton (1989) provide evidence supporting a positive relationship between unemployment rates and entering self-employment, while Blanchflower and Oswald (1991b) point towards the opposite effect. The inconsistency in these findings can be attributed to the differences in the populations under study. Our results suggest that labour market conditions have opposite effects on the transition probabilities of unemployed and wage-employed workers.

As far as the empirical estimation is concerned, we apply binomial and multinomial logit models to analyze the transition from employment and unemployment to self-employment. Self-employment duration is modelled by using discrete survival analysis. We use semiparametric methods to estimate

³Evans and Leighton (1989) obtain similar results for the US.

by maximum likelihood single risk models with unrestricted base-line hazards, by specifying duration dependence in a flexible way. We then estimate a competing risks model to distinguish exit into employment from exit into unemployment. We use an Extreme Value formulation which is consistent with a Proportional Hazards model in continuous time.

The paper is organized as follows. Section 2 describes some theoretical predictions about the effects of certain variables on self-employment transitions. Section 3 describes the data set used. The econometric specifications and estimation methods are described in Section 4, and Section 5 summarizes the main findings. Section 6 states the conclusions and some policy implications.

2 A theoretical framework

The dynamic aspects of self-employment are the focus of our research. Most self-employed started out as wage workers. The unemployed are a less important but still significant source. A number of questions are considered. What induces an individual to leave wage work or unemployment and become an entrepreneur? Are unemployed workers more likely to enter self-employment than are wage workers? How does the exit rate from self-employment change over the self-employment spell, and what is the effect of past unemployment on the exit rates to wage work or to unemployment?

These questions can be addressed within the comparative advantage framework (see for example Evans and Leighton (1989) and Rees and Shah (1986)). Individuals who have found a business opportunity must decide whether to follow it or not. Which they choose depends upon a comparison of the utility they expect to receive in the alternative occupations. Several (and possibly different) factors will affect their relative returns from self-employment ver-

sus wage work or unemployment. We assume that the rates of entry into and exit out of self-employment depend upon personal characteristics and cyclical trends in the economy.

2.1 The determinants of entry into self-employment

We first consider the probability of switching into self-employment from wage work. According to the comparative advantage model, this will occur if the expected value of self-employment exceeds the expected value of wage-work. We discuss some factors that affect employment status.

Education. Certain kind of experience and education individuals may have acquired over the years will improve their entrepreneurial earnings as well as the quality of the business they have discovered. Education serves as a filter such that the more educated tend to be better informed, implying that they are more efficient at assessing self-employment opportunities.

Assets. Entrepreneurship has a different work environment than wage work. It may be a riskier activity, so an individual must weigh the cost of risk in his calculations. Lack of capital may prevent even those individuals for whom the risk-adjusted expected returns from trying entrepreneurship is positive from starting a business. So an individual will be more likely to switch into self-employment the greater his net worth if there are liquidity constraints.⁴

Marital status and number of children. Family characteristics may also be indicators of risk aversion. On the one hand, it is possible that family support may make self-employment less demanding than it would be otherwise. On the other hand, married men will be less willing to take risks. This aspect

⁴For a formalization of entrepreneurial choice under liquidity constraints, see Evans and Jovanovic (1989), Holtz-Eakin et al. (1994a, 1994b) and Blanchflower and Oswald (1991a).

has received much attention in the literature, so it is useful to consider the empirical evidence for it.

Unemployment benefits. Concerning the explanatory factors of the transition from unemployment to self-employment, the key variable which determines the switching is whether the unemployed worker receives unemployment benefits or not. Standard search theory predicts a disincentive effects of benefits.⁵ Since benefits are the main source of income when unemployed, when they are exhausted, search intensity rises and the reservation wage falls, so that the opportunity cost of search decreases, thereby leading to an increase in the probability of leaving unemployment.

Business cycle. Regarding the influence of labour market conditions on self-employment, the theory provides an ambiguous prediction. The sign of the relationship may be analyzed in terms of what has been called "pull" and "push" factors. "Pull" factors are stronger when conditions are good. The prospects for business are better and people may be drawn into self-employment, knowing that if the venture fails another job offer will not be far away. Less favourable market conditions may provide a "push" factors increasing the labour supply for self-employment. High unemployment levels result in few offers of paid employment, and hence that many may prefer self-employment to spending long periods inactive and searching for work. Empirical work has not resolved this issue and there is little consensus on the role of macro-economic effects, particularly unemployment. For example, Evans and Leighton (1989) and Alba-Ramirez (1994), for the US and Spain, provide evidence supporting the unemployment push theory, while Blanchflower and Oswald (1991b) or Taylor (1996) point towards the pull argument

⁵See Bover, Arellano and Bentolila (1996) for a detailed empirical study, in the context of a duration model, of the effects of unemployment benefit duration and the business cycle on unemployment duration.

for UK. In fact, "push" and "pull" factors may operate simultaneously on different groups of individuals depending on certain personal characteristics and on their labour market situation. For example, unemployment rate may affect the transition from wage work and from unemployment in a different way. Assessing this becomes an empirical question.

2.2 Self-employed as "misfits"

Recent work in sociology has sought to explain the unusually high self-employment rate of certain "minority ethnic" groups of individuals. Light (1980) argues that individuals who are disadvantaged in the labour market tend to start business. Discrimination may push some individuals into self-employment. In addition, language barriers, ignorance of customs, poverty and unemployment may make self-employment more desirable than available wage work. In order for this theory to make economic sense one must assume that these disadvantages reduce wage earnings relatively more than self-employment earnings. In terms of the Roy-type models analyzed in Heckman and Sedlacek (1985) the disadvantage theory says that certain characteristics have higher return in self-employment than in wage work and therefore people with these attributes will tend to sort themselves into self-employment. For example, unemployed individuals may be viewed unfavourably by employers and will find it progressively harder to acquire a wage job. They may therefore find that their skills produce a relatively higher return in self-employment than in wage work. We explore these issues empirically analyzing whether unemployed individuals are more likely to switch into self-employment than are wage-workers for our sample of Spanish men below.

2.3 Self-employment duration

Many individuals who start businesses return to wage work or to unemployment and the effect of certain variables on self-employment duration may be different depending on the nature of exit.

Self-employment duration. Some self-employed may learn that either the entrepreneurial opportunity they discovered is not as good as they thought it would be or that they are not quite as good at running a business as they expected (see Jovanovic (1982) for a model along these lines). Such learning will take place during the early years of being an entrepreneur, so the longer an individual has been self-employed, the more likely he is to continue. This may be due both to self-employed businesses taking some time to become securely established and to people less suited to self-employment giving up after relatively short time.

Previous labour market status. Workers' situation before entering self-employment can be very informative about their probability of survival. If the origin state is unemployment, difficulties in finding a job may induce individuals to take self-employment as a temporary state, better than being unemployed. Along the same line, it is possible that people that have been employed have more chances of having success as self-employed. Consequently, the issue of whether the probability of departing from self-employment depends on previous labour market situation seems an interesting question to analyze empirically.

3 Data description

3.1 The data set

The data we use come from the Spanish Continuous Family Expenditure Survey (*Encuesta Continua de Presupuestos Familiares* (ECPF)). The ECPF

is a rotating panel based on a survey conducted by the Instituto Nacional de Estadística (INE - Spanish National Statistics Office). The ECPF reports interviews for about 3200 households every quarter. One eighth of the sample is renewed quarterly and hence we can follow an individual for a maximum of two consecutive years.

The ECPF started in 1985:I and we use the waves up to 1991:IV. This allows us to study the influence of personal characteristics taking into account changes in aggregate conditions during an extended period of time, so that we can assess the relative importance of these factors. Furthermore, we can observe "*entrants*" into self-employment, which avoids stock sample biases in the duration analysis.

This survey contains an extensive set of demographic characteristics, including information about basic variables for this study such as the labour market situation, income and wealth.⁶

Our sample includes men who are household heads⁷, aged 21 to 65. A male sample was chosen because of the well-known differences in male and female labour market behaviour, and the fact that women have very low self-employment rates.⁸ We select the 21-65 age band because we can find different rules of behaviour in the youngest and oldest men, and this can distort the results. We also excluded from our sample the agricultural sector, owing to the special characteristics of self-employment in agriculture and the fact that employment in general is decreasing noticeably since the

⁶Another available data set for Spain is the Labour Force Survey ("*Encuesta de Población Activa*" (EPA)), which allows to observe the labour market situation of an individual for up to six quarters, rather than eight. This longer time dimension is one of the reasons for using the ECPF. Moreover, the EPA does not contain information about wealth variables.

⁷This is the group for which the survey offers the most detailed and exhaustive information.

⁸This is highlighted by our data: as out of 8368 self-employees sampled, only 8.2 percent were women, so this longitudinal data set provide too few observations on self-employment entry and exit for these group of individuals.

60's in this sector.

Our initial sample included 53447 observations. After filtering the sample (see Appendix) we obtain 37174 observations. Table A1 reports the number of observations for each possible transition considered. To study transitions to self-employment we select the subsample of paid-employed and unemployed respectively. In the first case there are 25498 individuals of whom 381 enter self-employment. In the second case the sample size is smaller. As out of 1949 unemployed, the number of entrants into self-employment is 68. The dependent variable used in these estimations equal to 1 if individual who was a wage worker or unemployed in the survey quarterly becomes self-employed in the next survey quarterly observed.⁹

Concerning the duration analysis, the duration variable is the length of the spell of self-employment (completed or censored). After filtering the sample, the number of entrants into self-employment is 413, contributing 997 binary responses. Table A2 provides sample frequencies of duration of self-employment spells.

The explanatory variables used in the estimation can be classified into two groups: demographic variables relating the individual, and economic variables, relating to business cycle conditions. In the first group we include age, education, variables reflecting the family background and variables relating to the income and wealth of the individual. Most of these are grouped into categories and are treated as dummies in the estimation. In the second group, we include the National Unemployment Rate and the GDP growth to account for changes in the general economic conditions. In the Appendix we report information about the sample and the construction of the variables.

⁹We observe the labour force status once per quarter. Thus, if there are additional changes in status, they are missed.

3.2 Self-employment definition

In broad terms, self-employment can be considered to be the residual category of paid employment not remunerated by a wage. Ideally, self-employment may be defined more positively according to economic criteria such as of "risk", "control" and "responsibility". However, there are not available data based on criteria of this kind. Most current information on self-employment come from household interview surveys of the labour force. Individuals are asked to give their own assessment of their employment status. Although their reply can be supplemented by further information concerning their status for administrative purposes (for example whether considered as self-employed by social security administration), there are groups of individuals whose status may not be clear. One example is people simultaneously performing both self-employment and wage employment. In addition, whatever the details of the definition, the self-employed are a highly heterogeneous category, since it includes self-employed with and without employees, professionals and members of producers' cooperatives, which are groups whose labour market behaviour may be very different.

We found in our data a number of possible errors in the self-employment status and made several adjustments and deletions to minimize the effects of such errors. Thus, in our study we consider as self-employed a narrower group than the one defined by the ECPF. Two variables of the survey have been used: the labour market situation and the type of income the individual receives. We include in our definition those individuals who declare being self-employed (with or without employees) as their main activity and who in addition have self-employment earnings, although they may receive income from a secondary paid-work. An advantage of this criterion is that permits to capture clearly the characteristics of self-employed and to have a clean

comparison of the choice between self-employment and other alternatives, since we exclude those individuals that are not "genuine" self-employed.¹⁰

4 Empirical models and estimation methods

4.1 Probability of entering self-employment

To study the effect of economic and demographic variables on the transitions into self-employment, we use discrete choice models. In terms of the random utility framework, individuals will switch from wage-work or from unemployment to self-employment if the expected utility of self-employment exceeds the expected utility of the other alternative.

Let d_i^* represent the expected difference between the utility of the alternatives, given national economic variables, Y_N , as well as other variables in the information set of individual i . We specify d_i^* as follows

$$d_i^* = X_i' \beta_0 + Y_N' \beta_1 (X_i) + \varepsilon_i, \quad i = 1, \dots, I \quad (1)$$

where X_i denotes a vector of individual characteristics and ε_i is a disturbance term that includes unobserved variables. In our empirical model we allow for the possibility of different effects of the macro-economic variables across subpopulations defined by personal characteristics

$$\beta_1 (X_i) = \beta_{10} + \beta_{11} X_i. \quad (2)$$

The probability that an unemployed or paid-employed person in quarter t is observed self-employed in quarter $t + 1$, can be expressed as a conditional expectation

$$P \left(d_{it}^* \geq 0 \mid X_{i(t-1)}, Y_N \right) = F \left(X_{i(t-1)}' \beta_0 + Y_N' \beta_1 \left(X_{i(t-1)} \right) \right), \quad (3)$$

¹⁰A tighter definition considers self-employed exclusively those individuals whose only source of income comes from self-employment yields similar results.

where we specify F as the logistic cumulative distribution function:

$$F(u) = \frac{e^u}{1 + e^u} \quad (4)$$

We have used information about the individual's characteristics a period earlier (i.e. before switching), otherwise possible consequences of transition are likely to be confused with causes of transition. With respect to the general economic variables used, we have considered that when people make their transition decision, they use prior economic indicators in assessing their choice. Therefore, we use macroeconomic variables that are averages of the values over the year ending in the quarter of the survey.

We estimate binary logit models for unemployed and paid workers separately¹¹ and compare the estimated impact of a set of explanatory variables on the probability of switching to self-employment for both types of workers. This will permit us to assess if the unemployed workers are more prone than wage workers to start a business.

Moreover, we have estimated multinomial logit models for each subsample. Regarding the transition from paid-employment, we consider the possibility for an individual to become self-employed without employees or self-employed hiring other people. It is important to make this distinction since in principle may exist differential effects of the variables on the decision of entering one state or another. Respect to the transition from unemployment, we have estimated a multinomial model allowing for the possibility of switching into paid-work.

¹¹In this estimates the dependent variable equals 1 if the individual becomes self-employed in t .

4.2 Probability of leaving self-employment: single and competing risks models with flexible base-line hazards

We examine the dependence of exit from self-employment on the length of time in business by estimating the probability that an individual will survive T periods in self-employment and the probability of leaving self-employment during the next period, given that individual has been self-employed for T periods.¹² The individuals in our dataset are asked for up eight consecutive quarters about their labour market situation. From this information we can construct complete or incomplete self-employment durations for individuals entering self-employment. This allows us to calculate quarterly empirical hazards on the basis of complete durations of entrants and the surviving non-censored samples for up to seven quarters.

In our analysis we treat self-employment duration (T) as a continuous random variable which is observed at discrete intervals. Self-employment duration is right censored when the individual is still self-employed at the time of leaving the sample. Our observational plan is such that spell lengths are unknown but the interval during which spells end are known (i.e. we never observe T_i , we only observe whether $k_i < T_i < k_i + 1$, where k_i is the integer part of T_i , or whether $T_i > C_i$, being C_i the censoring time).

4.3 Single risk models

We first consider a single-risk duration model. Formally, let T_i be the length of a spell of self-employment. At this stage, only one hazard exists which may cause failure: leaving self-employment, without distinguishing exit into paid-employment from exit into unemployment. Then, the continuous time

¹²As pointed out by Evans and Leighton (1989), it is important to note that survival in self-employment is not necessarily equivalent to survival of a business since an individual may remain self-employed as he opens and closes successive business.

hazard for individual i at time t , $\theta_i(t)$, is defined by the equation

$$\lim_{h \rightarrow 0^+} \frac{\Pr[t+h > T_i \geq t \mid T_i > t]}{h} = \theta_i(t). \quad (5)$$

The hazard is parametrized using a Proportional Hazard specification:

$$\theta_i(t) = \lambda(t) \cdot \exp[x_i(t)' \beta], \quad (6)$$

where $\lambda(t)$ is the base-line hazard at time t , $x_i(t)$ is the vector of (in some cases time-dependent) explanatory variables for individual i (not including a constant) and β is a vector of parameters which is unknown.

The discrete time model can be estimated semi-parametrically without restrictions on the base-line hazard (as in Meyer (1990a) and Narendranthan and Stewart (1993)). The probability of a spell being completed by time $t+1$ given that it was still continuing at time t is given by

$$\begin{aligned} h_i(t) &= \Pr[T_i < t+1 \mid T_i \geq t] = 1 - \exp\left[-\int_t^{t+1} \theta_i(u) du\right] \\ &= 1 - \exp\left[-\int_t^{t+1} \lambda(u) \exp(x_i(u)' \beta) du\right]. \end{aligned} \quad (7)$$

Assuming that $x_i(u)$ is constant for $t \leq u < t+1$, i.e. that the changes in the time varying variables occur at integer points, the discrete time hazard can be written as

$$h_i(t) = 1 - \exp\left[-\exp\{\gamma(t) + x_i(t)' \beta\}\right], \quad (8)$$

with $\gamma(t) = \ln\{\int_t^{t+1} \lambda(u) du\}$ being an unrestricted parameter specific of each t that captures additive duration dependence. Thus, the discrete-time hazard takes the form of an Extreme Value distribution.

If d_i is the observed duration of the i th individual (completed or censored) and c_i is an indicator variable equal to 1 if the spell is completed and 0 if

it is censored, the contribution of the i th individual to the log-likelihood is given by

$$L_i = c_i \left(\sum_{t=1}^{d_i-1} \log [1 - h_i(t)] + \log h_i(d_i) \right) + (1 - c_i) \left(\sum_{t=1}^{d_i} \log [1 - h_i(t)] \right). \quad (9)$$

The log-likelihood of the sample, the sum of those contributions, is maximized with respect to β and a full set of γ 's to provide Maximum Likelihood estimates.

An useful alternative way of thinking of this model is to regard each exit or continuation in each period as an observation (see Kiefer (1987), Narendranathan and Stewart (1993), Sueyoshi (1995) and Jenkins (1995), Bover, Arellano and Bentolila (1996)). The i th individual in the sample contributes d_i "observations", so this model can be considered as a sequence of binary choice equations (with cross-equation restrictions) defined on the surviving population at each duration. In the most general case where there are no parameter restrictions across the $h_i(t)$, equation (8) can be estimated by a series of binary models with an Extreme Value distribution function formulation for the exit probability in each quarter.¹³

4.4 Competing risk models

The previous model specifies the determinants of a single risk: that of leaving the self-employment state. But much of the interest comes in the analysis of data in which failure can arise from two (or more) sources. That is, we wish to model duration jointly with the state exited into rather than duration alone.¹⁴

¹³Within this framework, other binary models, not implied by the Proportional Hazards formulation (i.e. Probit or Logit), can be estimated as alternatives.

¹⁴Competing risk models have been used by several authors to study unemployment durations jointly with the states into which the unemployed exit. Katz (1986), Ham and Rea (1987), Katz and Meyer (1988), Han and Hausman (1990) use such models to

So we consider a situation where there are competing risks. In our case, a spell of self-employment can end with either a paid-employment or with unemployment. This distinction may be important, since we can find significantly different behaviour with respect to the two risks. See Lancaster (1990) for a detailed description of competing risk models.

We can formulate these models assuming the existence of 2 independent random variables, T_1 and T_2 , one of each destination, and suppose that the actual destination entered is determined by the minimum of the $\{T_j\}$ ($j = 1, 2$), which is the duration we actually observe.

Assuming unique failure type, the overall hazard function is then given by

$$h_i(t) = h_{i1}(t) + h_{i2}(t). \quad (10)$$

We define indicators $c_{ij} = 1$ if i enters into state j ; 0 else ($j = 1, 2$).¹⁵ Then the log-likelihood contributions are given by

$$L_i = \sum_{j=1}^2 \left[c_{ij} \left(\sum_{t=1}^{d_i-1} \sum_{j=1}^2 \{ \log [1 - h_{ij}(t)] + \log h_{ij}(d_i) \} \right) + (1 - c_{ij}) \left(\sum_{t=1}^{d_i} \sum_{j=1}^2 \log [1 - h_{ij}(t)] \right) \right]. \quad (11)$$

The full log-likelihood is the sum of terms like (11) over $i = 1, 2, \dots, N$. We may interchange the order of summation and write

$$L = L_1 + L_2, \quad (12)$$

where

$$L_j = \sum_{i=1}^N \left[c_{ij} \left(\sum_{t=1}^{d_i-1} \{ \log [1 - h_{ij}(t)] + \log h_{ij}(d_i) \} \right) + (1 - c_{ij}) \left(\sum_{t=1}^{d_i} \log [1 - h_{ij}(t)] \right) \right] \quad (13)$$

distinguish recalls to the same firm from other exits. Narendranathan and Stewart (1993) use this type of model to distinguish exit into employment from exit into other non-employment states and Gil and Serrat (1994) to distinguish exit into employment from exit into self-employment.

¹⁵Note that $c_i = \sum_j c_{ij}$.

Thus, if distinct destinations depend upon disjoint subsets of parameters which are functionally independent, then, so far as the inference about $(\gamma_j(t), \beta_j)$ is concerned, the log-likelihood may be taken simply as L_j given by (13).

From this it can be seen that the parameters of a given cause-specific hazard can be estimated by single-risk methods by treating durations finishing for other reasons as censored at the point of completion. For example, the determinants of conditional probability of leaving self-employment by finding paid-work can be examined by treating spells which end with exit to an unemployment state as censored at the point of exit, and the same applies for the other exit.

4.4.1 Testing for the proportionality of baseline-hazards

Whilst the previous approach is very convenient, there is a potential disadvantage if we wish to test hypotheses involving restrictions across the cause-specific hazards. Then the joint estimation of the hazards is required. In this sense, an interesting restriction on the competing risk framework is the proportional base-line hazards model. The set of restrictions imposed by this hypothesis is the equality of the base-line hazard coefficients up to a factor of proportionality:

$$H_0 : \gamma_{i2}(t) = m \cdot \gamma_{i1}(t) \quad \forall t. \quad (14)$$

This means that at all times the base-line hazards of the two cause-specific hazards are in the same ratio.

Under H_0 , the conditional probabilities of exit into state 1 and 2 at time t , given an exit at that time are given by

$$h_{i1}(t) = F(\gamma_1(t) + x_i(t)' \beta_1), \quad (15)$$

and

$$h_{i2}(t) = F\left(m \cdot \gamma_1(t) + x_i(t)' \beta_2\right), \quad (16)$$

where $F(\cdot)$ is the Extreme Value cumulative distribution function:

$$F(u) = 1 - \exp[-\exp(u)]. \quad (17)$$

Thus, the calculation of the likelihood-ratio test statistic of the hypothesis that the baseline cause-specific hazards are all proportional to one another is carried out by using the maximized log-likelihood values of the restricted competing risk model and the unrestricted model, which in turn is the sum of the maximized log-likelihood values of the single risk models, considering durations finishing for other reasons than the one of interest as censored at the point of completion.

5 Empirical results

In this section we estimate the influence of the business cycle and certain individual characteristics on the transition probabilities into self-employment and on the hazard of leaving self-employment. We first focus on transition for wage workers and unemployed workers separately and follow with a comparison of the predicted probabilities of transition to self-employment between both types of individuals. Finally we report maximum likelihood estimates of the hazard of leaving self-employment for the single risk and competing risk models with unrestricted base-line hazards as described in Section 3. The qualitative impact of the variables are discussed in terms of the sign and statistical significance of the estimated coefficients. In order to assess the economic significance of the effects we also report predicted probabilities and hazards for some individual types.

5.1 Probability of entering self-employment from wage-work

The binomial logit estimates reported in the first column of Table 1 provide first insights into a number of factors affecting entry into self-employment. Column 2 reports multinomial logit estimates in order to account for the differences in the transition probabilities into self-employment with or without employees. The specifications include variables concerning demographic characteristics (age, education¹⁶), family structure (dummies for marital status and children), family assets (wealth measured by return on real state, interest payments and dividends) and demand side situation (unemployment rate and interactions between unemployment and education). We also take into account whether the individual has had a spell as self-employed during the last 12 months. In this way we attempt to control for the fact that the factors behind self-employment decision for individuals with an "unstable" pattern of self-employment experience may respond to seasonal effects.

We begin by considering the effects of family assets. The coefficient on the wealth variable provides evidence of the importance of access to capital markets on the probability of becoming self-employed. This finding is consistent with Evans and Jovanovic (1989) and Taylor (1996) and suggests that individuals face liquidity constraints. However, it appears that this problem does not affect the probability of switching among individuals who decide become self-employed without employees.

The dummies describing the family structure indicates a negative effect of children on the probability of switching, but this effect is only significant for those individuals not self-employed during the last 12 months. It is interesting to note that marital status does not seem to significantly influence

¹⁶Education can act as a proxy for the individual wage.

the probability of becoming self-employed.

Let us now examine the effect of Unemployment Rate. On its own, the effect of this variable suggests that employed individuals are more likely to move towards self-employment when the economic situation deteriorates. However, this effect only has a significant effect if the individual has not had prior self-employment experience and has a low or medium level of education.¹⁷ . From Table 2 we can see that the probability of switching for a person with low level of education when unemployment rate is high is more than twice greater than for a person with a university degree. This implies that self-employment is a more likely choice when demand in the labour market is low, and seems to support the "push" argument explained in Section 2. We also measured the aggregate effects by the rate of growth of GDP. The results are very close. We obtain a negative effect of this macroeconomic variable.¹⁸ This effect again supports the idea that employed individuals enter self-employment when the economic situation worsens.

Finally, we consider the effect of personal characteristics. As expected, the more educated an individual, the higher his probability of entering self-employment. Also it is interesting to point out that we obtain an even stronger positive effect when the individual becomes self-employed with employees. The effect of age is also the expected. The probability of switching is higher for middle-age people, particularly for those aged 35 to 45, and is much lower for those over 55,¹⁹ and for those living in rural areas.

From the estimated personal characteristics and business cycle effects and their interactions with the "not self-employed in the last 12 months"

¹⁷The total effect of the unemployment rate on higher educated individuals is -0.03 (t -statistic = -0.34).

¹⁸The estimated coefficient on the rate of GDP growth is -3.67 (t -statistic = -4.85)

¹⁹This result is again consistent with the view that entrepreneurs face liquidity constraints. Entrepreneurship may in fact not be an option for younger workers because they will have had less time to obtain the capital needed to start a business.

dummy, we can see that the reasons that make individuals with an irregular self-employment behaviour switch into self-employment are different from the reasons that make people without prior self-employment experience doing it.

5.2 Probability of entering self-employment from unemployment

Table 3 reports logit estimates of the probability of switching for unemployed individuals. The most interesting result is that the receipt of unemployment benefits considerably reduces the probability of enter self-employment. This is in agreement with the theoretical prediction of the model presented in Section 2. Further, the coefficient on the benefit variable is the most significant estimated effect to explain the transition from unemployment to self-employment and the one that produces the greatest change in the estimated probabilities. Table 4 shows that not receiving benefits increases the probability of switching by 0.1157 -from 0.0293 to 0.1450-, when the unemployment rate is low, and by 0.0604 -from 0.0142 to 0.0746-, when the unemployment rate is high.

Given the characteristics of the data it is not possible to determine the extent to which this result is due to a disincentive effect of benefits or to their role as a proxy for the attachment of the individual to the wage labour market. The negative effect of benefits is likely to capture state dependence on past spells as self-employed.²⁰ Indeed, when we estimate a multinomial logit model for the transition from unemployment to self-employment and wage employment (column 2, Table 3) we can see that benefits affect negatively both transitions, but the effect is stronger on the probability of switching into self-employment. Therefore, we must be cautious when interpreting the

²⁰Evans and Leighton (1989) find that the probability of entry is higher for individuals who have had prior self-employment experience.

negative effect of benefits on the probability of leaving unemployment.

Turning to the effect of the business cycle, the negative coefficient on the unemployment rate variable suggests that unemployed individuals are more likely to become self-employed when conditions are good.²¹ This implies that for unemployed individuals, self-employment appears to become a more attractive alternative when there is safety of paid employment available in case of failure.²² This result adds to the evidence supporting the prosperity "pull" argument for this type of workers. Moreover, it seems again that the business cycle situation does not affect the transition decision for those individuals with an unstable self-employment conduct.

Finally, the effects of other personal characteristics influence in the expected direction, being the oldest and lowest educated individuals less likely to turn into self-employment.

5.3 Entry from employment versus entry from unemployment

The previous analysis shows some differences in the impact of various characteristics on transition probabilities among employed and unemployed workers, mainly those referred to the business cycle. As explained in Section 2, the theory does not provide a clear prediction of the effect of unemployment on the probability of becoming self-employed. Our results suggest that this effect differs depending on the transition considered: unfavourable business conditions affect positively the probability of becoming self-employed for those individuals coming from employment and having low level of edu-

²¹We also attempted to control for business cycle conditions using the rate of GDP growth. This variable was non significant, with an estimated coefficient of 2.466 (t -statistic= 0.91).

²²By interacting the benefit dummy with the unemployment rate we obtain a less negative effect of this variable on the unemployed who do not receive benefits. However, in this case the direct effect of benefits is not significant.

cation and negatively for those who come from unemployment. So we can conclude that the processes that lead unemployed and employed workers to self-employment are different.

We now turn to compare the predicted probabilities for both groups of workers. In the first column of Table 5 we kept the unemployment rate at its sample mean (19.78%). We can see that unemployed workers are more likely to enter into self-employment than employed workers, mainly if not receiving benefits.

Taking into account the business cycle situation (columns 2 and 3 in Table 5), the results indicate that higher educated individuals are less likely to become self-employed if they are actually employed than if they are unemployed. When the unemployment rate is low, the probability of switching for a person unemployed receiving benefits is twice greater than for a person employed. If the unemployed worker does not receive benefits this figure rises to 9.5. This can reflect the higher opportunity cost (in terms of wages) that this group of individuals face.

We also found that for people with a low level of education, the probability of switching when the unemployment rate is low is higher again if the source state is unemployment, mainly when benefits are not received. However, when the unemployment rate is high, employed workers have a higher probability of starting a business than unemployed workers receiving benefits.

To sum up, a general conclusion from these results is that relatively poor workers -that is, unemployed not receiving benefits- are most likely to switch into self-employment. This agrees with the disadvantage theory presented earlier, which views self-employed as "misfits" for paid-work.²³

²³Rees and Shah (1985) and Evans and Leighton (1989) get similar results for the US and UK.

5.4 Duration of self-employment: flexible base-line hazard models

Maximum likelihood estimates for the single-risk model with unrestricted base-line hazards provides the starting point of the duration analysis. In the formulation given in the equation (8) we control for certain variables, including duration dependence and labour market situation prior to entering the self-employment spell. In particular, we include an indicator of whether the individual had been employed a quarter before the start of the spell. As in the previous section, the National Unemployment Rate is used to capture changes in the general economic conditions. Controls were also included for other individual characteristics. None of the characteristics such as education, age or marital status was statistically important. We should take into account however, that our data set has a serious limitation, in that we only observe entrants into self-employment over a short period of time (the maximum self-employment spell we can observe is 2 years).

First column of Table 6 contains parameter estimates for the single-risk Proportional Hazard model. In terms of the formulation given in equation (8), it implies that $h(\cdot)$ takes an Extreme Value distribution.²⁴ As pointed out before, our specification includes a flexible way to control for duration dependence by including a dummy variable for each quarterly duration. Durations of more than 3 quarters are excluded, due to their relatively small number of observations (see Table A2).

The results indicate that the hazard rate decreases with duration in self-employment -that is, the longer an individual has been self-employed, the more likely he is to continue. This may be due to the fact that a self-employed business takes some time to become securely established and it has

²⁴Probit and Logit models were estimated as alternative functional form specifications for $h(\cdot)$ and the fit of the models as measured by likelihood criterion is very similar.

access to more resources that when it first started.

The estimated effect of the previous labour market situation shows that those individuals who had a spell of unemployment in the 3 months before entering self-employment have a higher probability of moving out of self-employment. Therefore, one important conclusion here is that although unemployed workers are more likely to enter self-employment -as shown in the previous section-, past unemployment experience is negatively associated with staying in self-employment. This result supports the idea that these individuals enter self-employment to avoid unemployment, but at the same time they are less suited to self-employment leaving after a relatively short time. This may be due to the loss of human capital or because the lower quality of the information about their business opportunities. However, single-risk models are not very informative about the genuine effect of the variables on the probability of leaving self-employment. The reason is that the effect of some variables may be more pronounced in the unemployment hazard than in the employment hazard. This point will be considered below.

Another interesting result is shown in Table 7, which summarizes the predicted hazard for workers previously employed and unemployed, keeping unemployment rate at its sample mean. It is apparent from that table that at durations of three months, the hazard for workers previously unemployed is three times greater than the hazard of those previously employed. Moreover, the decline in the probability of leaving self-employment is more pronounced among workers with a previous unemployment spell, falling from 0.40 in the first quarter to 0.26 by the second quarter in self-employment.

Finally, the National Unemployment Rate has a significant upward effect on the probability of leaving self-employment.

5.5 Single-risk versus competing-risk models

The estimation of the single-risk model does not let us specify separately the effect of the variables on the self-employment duration through their effect on the probability of receiving (and accepting) a job offer and the probability of exit into unemployment. For this reason, we now consider a competing-risk model. Specifically, it will allow us to distinguish whether the previous labour market situation has a different effect on the two destination states considered.

The results for the model using the competing-risk framework are given in the second column of Table 6. As we might expect, the downward impact on the hazard of having a job in the 3 months before the start of the current self-employment spell is considerably more marked in the unemployment hazard than in the employment one: about three times the size. We can attribute this in part to those with unemployment experience in the past being more likely to exit into unemployment when they leave their self-employment period.

The results also indicate that dummy variables capturing duration dependence and the unemployment rate are significant in the single-risk model and in the competing-risk model for the exit into employment, although they are not significant for the exit into unemployment. Given the small sample size and the small fraction of sample that switches out of self-employment towards unemployment, this lack of statistical precision is not surprising.

We now turn to the test of the proportionality among the base-line hazard of the exit states. The results are contained in Table 8. The restricted log-likelihood was calculated and the test statistic, distributed as a χ^2 -variate with 2 degrees of freedom is 1.336 (the 5% critical point is 5.99). The null hypothesis of proportionality is accepted.

6 Conclusions

Our principal findings can be summarized as follows. (1) Unemployed individuals are more likely to switch into self-employment. This result is consistent with the view that the disadvantaged tend to become self-employed. (2) However, the business of those entering to self-employment from unemployment suffer more difficulties (higher failure rate) than the business set up by people who had moved to self-employment from an employee status. In addition, the negative effect of previous unemployment experience is much stronger on the probability of switching out of self-employment towards unemployment than on the probability of leaving self-employment and entering a job. (3) Receiving unemployment benefits reduces the probability of entering self-employment. (4) The probability of switching increases with assets. Liquidity constraints therefore appear to be important in determining entrepreneurial selection, but only for those wage-workers who become self-employed with employees. (5) The probability of departing decreases with duration in self-employment. (6) Higher unemployment rates push lower educated employed individuals towards self-employment. However, self-employment appears to become a more attractive alternative for unemployed individuals when economic situation improves. (7) Better educated and middle-age workers are more likely to switch.

Our results are useful not only for the study of entrepreneurship but also for understanding the role of self-employment in the economy. The fact that self-employment provides a escape for poor workers suggests that policies which make it more expensive to start and operate a business will tend to increase unemployment.

Appendix

Individual data

Source. Rotating panel from the Spanish Continuous Family Expenditure ("Encuesta Continua de Presupuestos Familiares") from 1985:I to 1991:IV, provided by the National Statistical Office (Instituto Nacional de Estadística (INE)).

Sample. From a sample of men of 21 to 65 years of age we exclude those

- * always self-employed during the observed period

- * never in the labour force during the observed period

- * observed only once

- * with a missing interview in between two valid interviews

37174 observations satisfy these restrictions, of which 25498 and 2412 are used to estimate the probability of entering self-employment from wage-work and unemployment respectively.

Education. We consider the following categories: Illiterate and no schooling, Primary education, Secondary education and University education.

Age. It is grouped into four categories: 21 to 35 years old, 35 to 45 years old, 45 to 55 years old and 55 to 65 years old.

Marital status. The variable takes the value 1 for married individuals and 0 otherwise.

Children. Dummy for individuals with children younger than 18.

Unemployment benefits. The variable takes the value 1 for unemployed individuals receiving benefits.

Family assets. Income received by the family, including rental income, interest and dividends.

Previous self-employment. The variable takes the value 1 if not observed a spell as self-employed in the last 12 months.

Previous employment. Dummy equal to 1 if the individual was employed one quarter before entering self-employment and 0 if unemployed.

Rural area. Dummy for individuals who live in a rural area.

National economic variables

Unemployment Rate. Source: "Encuesta de Población Activa" (EPA), INE.

Gross Domestic Product. Source: "Cuentas Financieras de la Economía Española", Banco de España.

Table A3 provides the frequencies of the variables used in the analyses.

Table A1. Number of observations per transition

Source State	Destination State			
	Empl.	Unempl.	Self-empl.	Self-empl. without empl.
Empl.	-	-	381	209
Unempl.	463	-	68	-
Self-empl.	96	8	-	-

Table A2. Sample of entrants into self-employment

	Number	Percentage	Non-censored	Censored
Total number of spells	413	100.00	104	309
Duration of the self-empl. spell				
1 quarter	164	39.71	64	100
2 quarters	90	21.79	23	67
3 quarters	74	17.92	13	61
4 quarters	33	7.99	2	31
5 quarters	24	5.81	2	2
6 quarters	17	4.12	0	17
7 quarters	11	2.66	0	11

Table A3. Frequencies of individual variables
Sample of entrants into self-employment

	From employment		From unemployment	
	Number	Percentage	Number	Percentage
<i>Age</i>				
21 to 35 years old	7094	27.82	339	17.39
35 to 45 years old	8190	31.12	427	21.91
45 to 55 years old	6779	26.59	576	29.55
55 to 65 years old	3435	13.47	607	31.14
<i>Education</i>				
Illiterate and no schooling	2898	13.36	688	35.30
Primary education	15969	62.63	1143	58.64
Secondary education	3559	13.96	75	3.84
University education	3072	12.05	43	2.21
<i>Family characteristics</i>				
Married	24558	96.31	1827	93.74
With children	20574	80.69	1385	71.06
<i>Benefit receipt</i>				
Receiving benefits	-	-	1400	71.83

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