

**TRANSITION PROBABILITIES TO EMPLOYMENT
AND NON-PARTICIPATION***

Pablo Antolín Nicolás**

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ABSTRACT

The analysis of the probability of leaving the unemployment pool is commonly done without distinguishing the exit state. All the people who exit unemployment do not do so into employment, instead some become inactive. In this paper I then distinguish and examine the transition probabilities from unemployment to employment and non-participation. I find that the factors that affect the transition probabilities to each state are not necessarily the same, and their effects are different in direction and/or magnitude.

KEY WORDS: Unemployment analysis, qualitative choice models.

RESUMEN

El análisis de la probabilidad de salir del desempleo se hace normalmente sin distinguir el estado al cual se va. Todos los individuos que dejan el desempleo no pasan a ser empleados, sino que algunos pasan a la inactividad. En este trabajo distingo y examino las probabilidades de transición del desempleo a el empleo y a la inactividad. Se encuentra que los factores que afectan a las probabilidades de transición a cada uno de los estados no son necesariamente los mismos, y los efectos van en diferente dirección y/o son de diferente magnitud.

PALABRAS CLAVE: Análisis del desempleo, modelos de elección cualitativa.

I. INTRODUCTION.

Unemployment is one of the major concerns of the Spanish economy. The problem of unemployment comprises three related issues: first, the sharp rise in unemployment in periods of economic crisis; second, the persistence of unemployment at high levels; and, third, the large proportion of people unemployed for a year or longer.

Some studies (e.g. Antolin (1994a)) have pointed out that it is the inability of the flows out of unemployment to keep track with and offset the flows into unemployment where the problem of unemployment must be tackled. That is, the probability of leaving the unemployment pool is one of the main factors in explaining the persistence of unemployment at high levels and the negative duration composition of unemployment. In this paper we examine some issues concerning the probability of leaving the unemployment pool.

The analysis of the exit probability from unemployment or the probability of leaving the unemployment pool is commonly done without distinguishing the exit state. All the people who exit the unemployment pool do not do so into employment, instead some of these people leave the unemployment pool to become inactive. Therefore, studies that examine the probability of leaving the unemployment pool without distinguishing the exit state could be misleading with respect to assess the re-employment probability because some of those who leave unemployment do so to non-participation. This problem may be more acute for the long term unemployed, in periods of slump, and for the case of women.

In this paper we address the issue of distinguishing the exit state when analysing the probability of leaving unemployment. To do so, we examine the transition probabilities from unemployment to employment and to non-participation: we investigate the main determinants of both transition from unemployment and we also address the issue of whether to leave unemployment to move to either employment or non-participation are two different behavioral labour force states or choices (Flinn and Heckman (1983), Tano (1991), and Gonul (1992)).

We will see that the factors that affect the transition probability to employment are not necessarily the same factors that affect the transition probability to non-participation, and their effects are in a different direction and/or magnitude. Different economic conditions seem to entail different responses by women, but they do not seem to affect men. Family circumstances are the main factors distinguishing different behaviours by gender and explaining why women drop out of the labour force.

The paper is organised as follows: Section II describes some issues concerning the probability of leaving the unemployment pool and presents the framework of analysis. Section III examines the data at hand and the main characteristics of our sample. Section IV presents the main results of our econometric analysis. And Section V concludes.

II. THE PROBABILITY OF LEAVING THE UNEMPLOYMENT POOL.

The unemployment rate measures the probability of being unemployed, π_u . We can decompose the unemployment rate into two main components. The inflow rate into unemployment and the average duration of unemployment spells. The former is proxing the probability of entry into unemployment, π_e ; and the latter the unemployment duration, d . The evolution and situation of the labour market is going to determine the inflow into unemployment. To examine the determinants of the unemployment duration (ie. duration of unemployment spells) is equivalent to examine the probability of leaving the unemployment pool conditional to have been unemployed until this moment, π .

The (conditional) probability of leaving unemployment has two components. First, the probability of receiving a job offer (with a certain wage associated), π_o . Second, the probability of accepting the job offer, in other words, the probability of the job offer exceeding the reservation wage, π_a . The probability π_o is associated with the job search behaviour of the unemployed (see Antolin (1994b) for an examination of job search behaviour in the Spanish labour market).

The standard way of examining the unemployment duration is by specifying the conditional probability of leaving unemployment, the hazard function. Under this procedure it is estimated the probability that an individual who is currently unemployed, i.e., at time t , will leave the unemployment pool in the next period, $t+1$, conditional on his having entered unemployment at time $t-s$ and on his being unemployed at t . This is the type of analysis presented in Nickell (1979a,b), Lancaster and Nickell (1980), and, for the case of Spain, Cebrian et al. (1993). The purpose of this type of analysis is to estimate the conditional probability of leaving unemployment given a sample of currently unemployed individuals (e.g., the INEM records of the registered unemployed) and to look at the impact of unemployment benefits on such probability and how this probability changes over the course

of an unemployment spell. Such probability is modeled as a function of personal characteristics, demand side variables, job vacancies and the associated wage offer distribution.

The main findings of this type of studies are: first, expected duration is significantly influenced by the replacement ratio with elasticity about unity. Second, the effect of benefits levels on the probability of leaving the unemployment pool in any given week is significant for the first 20 weeks or so, but it is negligible thereafter. Third, the conditional probability of an individual leaving the unemployment pool declines steadily after the first six months of a spell, falling to a very low level.

These studies model the unemployment duration by specifying hazard function without distinguishing the exit state. They do not consider the possibility that unemployed people can leave the unemployment pool to inactivity, instead of to employment, but some of those who exit the unemployment do not do so into employment. Thus, these studies examine the probability of leaving unemployment rather than the re-employment probability. The analysis of the exit probability from unemployment could be misleading with respect to assess the re-employment probability because some of those who leave unemployment do so to non-participation. This problem may be more acute for the long term unemployed and for women. There is then a need to examine both transitions from unemployment, to employment and to non-participation. We intend to examine whether the transition from unemployment to employment and the transition from unemployment to employment are behavioral meaningful distinctions, that is, the equations governing both transitions are distinctly different.

The studies which examine unemployment duration by estimating the conditional probability of leaving unemployment given a sample of currently unemployed individuals cannot address the issue of distinct behavioral equations governing transitions from unemployment to employment or to non-participation because the type of sample they use, i.e., people who is currently unemployed. However, there is the possibility of estimating the determinants of (or which factors affect) the probability of leaving the unemployment pool and distinguish between transitions to employment and transitions to unemployment, at the same time, by examining such probability in a sample of individuals unemployed at $t-1$ and who are either employed, unemployed, or inactive at t .

We then examine whether both transitions are behavioral different or not and we estimate the probability of leaving the unemployment pool given a sample of individuals who are currently employed, unemployed or inactive but they were previously unemployed. We

want to estimate different behavioral equations for these categories. The dependent variable have then three possible outcomes (employment, non-participation, and unemployment), and it is then a polychotomous variable (unordered in this case). The model to examine unordered polychotomous variables is the Multinomial Logit Model (MLM), presented in Appendix A.

In this paper we apply the MLM to the prediction of labour market status of individuals who were previously unemployed, based on certain personal characteristics and local economic conditions. The purpose of this paper is to study the factors that influence the individual's probability of leaving the unemployment pool and to examine whether to move into employment or into non-participation are two different behavioral choices.

We characterise the probability that an individual who is unemployed leaves the unemployment pool as a function of the individual's personal characteristics, such as personal factors (i.e., sex and age), family characteristics, or human capital factors (i.e., education), and regional economic variables.

Denote X_i as a vector of the individual's observed characteristics, R_i as the vectors of regional or economic conditions, and ϵ_i is a disturbance term which includes unobserved variables. The probability of each event or category j (i.e., employed, inactivity, or unemployed), conditional on R , and X , can be written, following the MLM presented in Appendix A, as

$$P_j = \frac{G(\beta'_j X + \mu'_j R)}{1 + \sum_{j=1}^{m-1} G(\beta'_j X + \mu'_j R)} \quad [1]$$

$$P_m = \frac{1}{1 + \sum_{j=1}^{m-1} G(\beta'_j X + \mu'_j R)}$$

where $j=1, \dots, m-1$, G is the cumulative distribution function of ϵ_i (the exponential function in the case of the MLM), and¹

$$\mu_j = \mu_j(X) = \mu_{oj} + \mu_{1j} X_i \quad [2]$$

¹ Note that we specify such probability by allowing the interaction between personal characteristics and regional economic variables.

Our purpose is to examine which factors determine the probability that an individual leaves the unemployment pool with respect to those who stay, and which are the differential factors between those who move into employment and those who move out of the labour force.

III. THE DATA

The data used in this study come from the Spanish Labour Force Survey ("Encuesta de Población Activa" (EPA)) conducted by the Instituto Nacional de Estadística (INE-the Spanish National Statistics Office). The EPA is conducted on all members of around 60,000 households (approximately 200,000 persons) each quarter. Every second quarter of the year some questions concerning the individual's situation one year prior to the interview have to be answered as part of the EPA. The questions relate to the region of residence, the situation with respect to the labour market, the source of earnings and the economic sector, all these referred to the 2nd quarter of the previous year.

In our study an individual is considered as having left the unemployment pool if s/he was unemployed a year ago and it is currently employed or is non-participating in the labour force². Our sample includes both men and women, aged 16 to 65, who were unemployed last year and they are today unemployed, employed, or out of the labour force. The sample is also confined to Spanish citizens not living abroad at the time of the survey or in the previous year (those in the North African enclaves of Ceuta and Melilla are not included either)³.

It is important to distinguish between variables defined at the time of the survey and those defined one year earlier. When studying the determinants of leaving the unemployment pool we have to use mainly information about the individual's situation a year earlier (i.e.

²There could exist the problem of some people having being unemployed a year ago and having gained employment in some period since then but being unemployed at the moment in which the survey was carried out. We checked this possibility (Q: How long have you been out of work, if worked before?). Our results seem not to vary much.

³ We also exclude those individuals who:
(i) did not answer the questions about their relationship with the labour market the previous year (these are generally people younger than 16 the previous year)
(ii) report being in the army either at the time of the survey or the previous year.

when unemployed), otherwise possible consequences are likely to be confused with causes of leaving the unemployment pool.

In Appendix B, we report detailed information about the construction of the variables used in this work. We also provide Tables with information on the data, both about our sample of individuals from the EPA and about the general economic variables.

We compare two labour force surveys, the one corresponding to the second quarter of 1987 and the one corresponding to the second quarter of 1991. Only in each second quarter questions about the situation a year earlier are asked. During the period from the second quarter of 1986 to the second quarter of 1987 the unemployment rate was very high, 21.1% on average, but the economic perspectives were becoming positive. However, in the period from the second quarter of 1990 to the second quarter of 1991, unemployment reached its lower point, 15.9%, and it remained low, 16.1% on average, but the economic perspectives were beginning to look gloomy and the Spanish economy was entering the slump that we are currently just coming out from. In the first period, 1986-87, unemployment was almost as its highest level and beginning to fall; and in the second period, 1990-91, unemployment was at its lowest level of the last twelve years (see Figure 1).

In Tables 1 and 2 we can examine the main features of our samples. First, in 1987 out of 13270 individuals who were previously unemployed, 8685 (65.45%) were still unemployed, 3862 (29.10%) were employed, and 723 (5.45%) left the labour force. While in 1991 out of 11753 individuals who were previously unemployed, 6989 (59.47%) were still unemployed, 4039 (34.37%) were employed, and 725 (6.17%) left the labour force. Second, the proportion of people who continued unemployed fell between both years, while the proportion of people who became inactive increased slightly. Third, women were more likely than men to become inactive in 1987 as well as in 1991, yet there was a slight improvement in the likelihood of becoming employed with respect to the other two situations. Whereas, men were more likely to become employed. Fourth, people older than 50 were more likely to become inactive in both years, probably due to early retirement policies. The very young, those aged 16 to 19, improved their likelihood of becoming employed. People aged 35 to 49 became slightly more likely to be unemployed and inactive than previously. Fifth, as to education, it seems that people with no studies were more likely to become inactive; other levels of education did not seem to matter much. Sixth, people who were head of household were more likely to become employed, whereas people who were not head of household were more likely to become inactive or remain unemployed, this may have been capturing possible gender and age effects.

Figure 1. Spanish Unemployment Rate
1986.1-1994.2

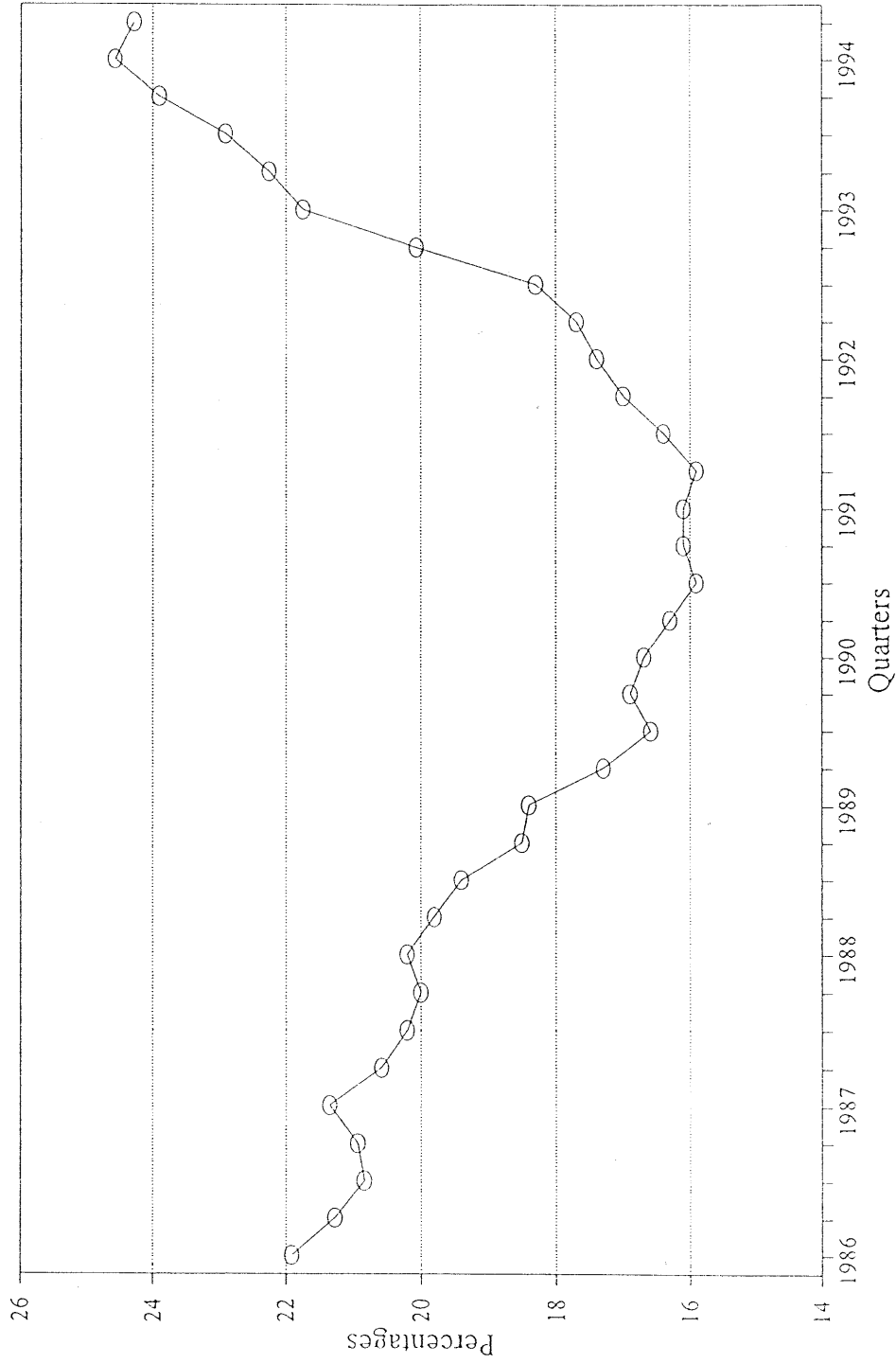


Table 1. Personal characteristics 1987

	Employed	Unemployed	Inactive
Total	3862 (29.10)	8685 (65.45)	723 (5.45)
Sex			
Female	1135 (29.39)	3837 (44.18)	413 (57.12)
Male	2727 (70.61)	4848 (55.82)	310 (42.88)
Age			
16-19 yrs. old	773 (20.02)	1823 (20.99)	163 (22.54)
20-24 yrs. old	1158 (29.98)	2508 (28.88)	157 (21.72)
25-34 yrs. old	1046 (27.08)	2115 (24.35)	173 (23.93)
35-49 yrs. old	614 (15.90)	1343 (15.46)	95 (13.14)
50-64 yrs. old	271 (7.02)	896 (10.32)	135 (18.67)
Education			
No studies	465 (12.04)	1044 (12.02)	136 (18.81)
Primary	2525 (65.38)	5684 (65.45)	435 (60.17)
Secondary	427 (11.06)	991 (11.41)	83 (11.48)
Intermediate	307 (7.95)	639 (7.36)	57 (7.88)
Superior	138 (3.57)	327 (3.77)	12 (1.66)
Marital Status			
Single	2350 (60.85)	5544 (63.83)	355 (49.10)
Married	1512 (39.15)	3141 (36.17)	368 (50.90)
Family Status			
Head of household	1154 (29.88)	1917 (22.07)	165 (22.82)
Status: single	102 (2.64)	244 (2.01)	32 (4.43)
married non-working	841 (21.78)	1319 (15.19)	109 (15.08)
married working wife	211 (5.46)	354 (4.08)	24 (3.32)
Children: no children	153 (3.96)	325 (3.74)	46 (6.36)
children<16	847 (21.93)	1147 (13.21)	69 (9.52)
other	154 (3.99)	445 (5.12)	50 (6.92)
Non-head of household	2708 (70.12)	6768 (77.93)	558 (77.18)
HH status: employed	1541 (39.90)	3515 (40.47)	349 (48.27)
unemployed	254 (6.58)	801 (9.22)	51 (7.05)
inactive	913 (23.64)	2452 (28.23)	158 (21.85)
Children: no children	105 (2.72)	292 (3.36)	40 (5.53)
children <16	1040 (26.93)	2693 (31.01)	280 (38.73)
other	1563 (40.47)	3783 (43.56)	238 (32.92)

Table 2. Personal characteristics 1991

	Employed	Unemployed	Inactive
Total	4039 (34.37)	6989 (59.47)	725 (6.17)
Sex			
Female	1586 (39.27)	3911 (55.96)	470 (64.83)
Male	2453 (60.73)	3078 (44.04)	255 (35.17)
Age			
16-19 yrs. old	694 (17.18)	924 (13.22)	94 (12.97)
20-24 yrs. old	1204 (30.70)	1726 (24.70)	121 (16.69)
25-34 yrs. old	1234 (30.55)	2197 (31.44)	235 (32.41)
35-49 yrs. old	629 (15.57)	1427 (20.42)	141 (19.45)
50-64 yrs. old	242 (5.99)	715 (10.23)	134 (18.48)
Education			
No studies	345 (8.54)	746 (10.67)	110 (15.17)
Primary	2545 (63.01)	4473 (64.00)	450 (62.07)
Secondary	571 (14.14)	968 (13.85)	99 (13.66)
Intermediate	394 (9.75)	474 (6.78)	34 (4.69)
Superior	184 (4.56)	328 (4.69)	32 (4.41)
Marital Status			
Single	2529 (62.61)	3987 (57.05)	296 (40.83)
Married	1510 (37.39)	3002 (42.95)	429 (59.17)
Family Status			
Head of household	954 (23.62)	1401 (20.05)	141 (19.45)
Status: single	116 (2.87)	264 (3.78)	27 (3.72)
married non-working	649 (16.07)	864 (12.36)	93 (12.83)
married working wife	189 (4.68)	273 (3.91)	21 (2.90)
Children: no children	152 (3.76)	250 (3.58)	42 (5.79)
children<16	663 (16.42)	783 (11.21)	45 (6.21)
other	139 (3.41)	368 (5.27)	54 (7.45)
Non-head of household	3085 (76.38)	5588 (79.95)	584 (80.55)
HH status: employed	1766 (43.72)	3106 (44.44)	383 (52.83)
unemployed	221 (5.47)	507 (7.25)	33 (4.55)
inactive	1098 (27.18)	1975 (28.26)	168 (23.17)
Children: no children	168 (4.16)	333 (4.76)	48 (6.62)
children<16	1631 (40.38)	2196 (31.42)	303 (41.79)
other	1886 (46.69)	3059 (43.77)	233 (32.14)

We carried out an examination of the main patterns as to the current labour market status of individuals who were previously unemployed. The main patterns seem to be the following: for women in the 1987 sample, first, the type of women who moved into employment or remained in unemployment seem to be more alike than the type who became inactive (there is a scope for different behavioral equations from transitions to employment and to non-participation); second, the group of women who became inactive were mostly married women with young children and the head of the household was employed. For women in the 1991 sample, first, there are now fewer differences in any of the three labour market categories, but unemployed and non-participation seem to be more alike; second, young, single women seem to be more likely to become employed, but young, married women with young children and living in a household where the head was employed seem to have a higher likelihood of becoming unemployed or inactive.

The main patterns for men, in the 1987 sample, are: first, employment and unemployment status were more alike (in the sense of the type of individuals who became so) than the non-participation status; second, men who became inactive were mostly older men whose wives did not work, but who did not seem to have children to support; on the other hand, men who became employed or remained unemployed had wives and young children to support. Finally, the same pattern is repeated for men in the 1991 sample.

In conclusion, it seems that employment and unemployment status, on one hand, and non-participation status, on the other hand, are different behavioral transitions because different people seem to move to them. The time frame does not seem to affect men, but it does affect women, therefore different economic situations seem to entail different responses by women. It seems that the main reasons why women drop out of the labour force are particularly family circumstances.

IV. THE RESULTS.

In this section we present the main results corresponding to the maximum likelihood estimation of equation (1) assuming a logistic distribution for G , as described in Section II.

Tables 3 and 4 present the results of multinomial logit regressions on the probability of leaving unemployment. The results presented in this table are the estimation coefficients of the explanatory variables, vector X, with respect to $\log_e(P_1/P_3)$ and $\log_e(P_2/P_3)$, where P_1 is the transition probability to employment, P_2 is the transition probability to non-participation, and P_3 is the probability of remaining unemployed. Table 5 provides the estimated probabilities for given characteristics. These estimated probabilities are calculated by applying the following formula:

$$\begin{aligned}
 P_1 &= \exp(\beta_1'X)/(1 + \exp(\beta_1'X) + \exp(\beta_2'X)) \\
 P_2 &= \exp(\beta_2'X)/(1 + \exp(\beta_1'X) + \exp(\beta_2'X)) \\
 P_3 &= 1/(1 + \exp(\beta_1'X) + \exp(\beta_2'X))
 \end{aligned}$$

The whole analysis is carried out with respect to an individual age 35 to 49 (prime working age), with low level secondary education, head of household, non-married, no dependent children, who has not migrated, and in a standard region. The results presented are for the total sample and also for the male and female subsamples, separately. The likelihood ratio test on the male-female sample split is 157.99 for 1987 and 116.34 for 1991, against $\text{Chi-square}(16) = 26.3$ at 95%.

The transition probability to employment in 1987 is quite large, around 44.1%; however the majority of the people who were unemployed are more likely to remain so, with a likelihood of 53.9%. The likelihood of those who move out of the labour force is very low, around 2%.

The dummies controlling for *age* have very distinctive effects. People aged 50 and over, see their probability of moving into employment largely reduced with respect to the standard individual (i.e., prime age, 35-49), and their likelihood of moving out of the labour force improves substantially. Young people are more likely to be employed than prime age individuals and also more likely to move out of the labour force. So young people have a lower tendency to participate in the labour market if they do not find a job.

The effect of having different *educational levels* is not very marked. People with a higher level of education (e.g. university degree) are less likely to move out of the labour force. The transition probability to non-participation falls for individuals with university education, but education has not any statistically distinctive effect on the transition probability to employment. This general pattern varies substantially between women and men. Education level does not seem to have statistically significant effects on the transition probabilities for men. As to women, higher educational levels improve the likelihood of becoming employed and reduce the likelihood of becoming inactive.

Table 3A.
Choice Based ML Estimations of the Status of
previously Unemployed Individuals (1987)

Variables	Employed	Inactive	Unemployed
Constant	-0.1997 (0.2310)	-3.2991* (0.4610)	0
Aged 16 to 19	0.4901* (0.0850)	0.7042* (0.1668)	-1.1943
Ages 20 to 24	0.4998* (0.0777)	0.2669 (0.1593)	-0.7667
Aged 25 to 34	0.3687* (0.0692)	0.2904* (0.1417)	-0.6591
Aged 50 to 64	-0.6139* (0.0901)	0.8752* (0.1544)	-0.2613
No studies	0.0544 (0.0920)	0.2810 (0.1722)	-0.3354
Primary	-0.0372 (0.0653)	-0.1483 (0.1291)	0.1855
High Secondary	0.1742 (0.0924)	0.0388 (0.1822)	-0.2130
Superior	0.0383 (0.1211)	-0.8084* (0.3200)	0.7701
Female	-0.6002* (0.0459)	0.5477* (0.0964)	0.0525
Non HoH	-0.5683* (0.0713)	0.2752 (0.1420)	0.2931
Married	0.0650 (0.0610)	0.7564* (0.1108)	-0.8214
Dep. Child	(0.0633 (0.0448)	0.0185 (0.0869)	-0.0818
Migrate	0.9456* (0.3104)	-0.6975 (1.0285)	-0.2481
Unemployment	-1.5620* (0.3672)	-2.0825* (0.7505)	3.6445
Vacancies	(0.7046* (0.2016)	0.3653 (0.3993)	-1.0699
Real wages	-0.00032 (0.000202)	-0.00006 (0.000404)	0.00038

Table 3A

-2 Log L	20364.813	
Degrees of Freedom	3758	
Likelihood Ratio	3697.13	prob = 0.7575
Sample size	13270	

Notes:

Standard errors in parenthesis

Figures in final column obtained from normalization requirement that the sum of the coefficient for each variable equal zero

* denotes significance at 95%

The likelihood ratio statistic compares the specified model with the unrestricted (saturated) model and it is an appropriate goodness of fit test for the model. Non-significance of the LR implies that the model fits.

Table 3B.
Choice Based ML Estimations of the Status of
previously Unemployed Women(1987)

Variables	Employed	Inactive	Unemployed
Constant	-1.2097* (0.4055)	-1.8865* (0.6285)	0
Aged 16 to 19	0.4312* (0.1521)	0.5353* (0.2203)	-0.9665
Ages 20 to 24	0.2740 (0.1453)	0.4517* (0.1986)	-0.7257
Aged 25 to 34	0.2894* (0.1351)	0.3860* (0.1735)	-0.6754
Aged 50 to 64	-0.4021 (0.2467)	0.4896* (0.2424)	-0.0875
No studies	0.4079* (0.1753)	0.4814* (0.2340)	-0.8893
Primary	-0.0849 (0.1006)	-0.0953 (0.1608)	0.1802
High Secondary	0.2791* (0.1321)	-0.2410 (0.2316)	-0.0381
Superior	0.1195 (0.1792)	-1.5954* (0.5291)	1.4759
Non HoH	-0.3275 (0.1880)	-0.9412* (0.2514)	1.2687
Married	-0.2236* (0.1019)	1.1252* (0.1459)	-0.9016
Dep. Child	0.1144 (0.0753)	0.0642 (0.1180)	-0.1786
Migrate	0.3613 (0.4888)	-0.5697 (1.0459)	0.2084
Unemployment	-1.0156 (0.6657)	-0.4445 (1.0564)	1.4601
Vacancies	0.4743 (0.3292)	-0.2082 (0.5378)	-0.2661
Real wages	0.00006 (0.00033)	-0.00012 (0.00054)	0.00006

Table 3B

-2 Log L	8047.1402	
Degrees of Freedom	1700	
Likelihood Ratio	1684.43	prob = 0.6012
Sample size	5385	

Notes:

Standard errors in parenthesis

Figures in final column obtained from normalization requirement that the sum of the coefficient for each variable equal zero

* denotes significance at 95%

The likelihood ratio statistic compares the specified model with the unrestricted (saturated) model and it is an appropriate goodness of fit test for the model. Non-significance of the LR implies that the model fits.

Table 3C.
Choice Based ML Estimations of the Status of
previously Unemployed Men (1987)

Variables	Employed	Inactive	Unemployed
Constant	-0.2349 (0.2996)	-2.4819* (0.7301)	0
Aged 16 to 19	0.4686* (0.1076)	1.5433* (0.2883)	-2.0119
Ages 20 to 24	0.5860* (0.0951)	0.4886 (0.2893)	-1.0746
Aged 25 to 34	0.3878* (0.0813)	0.3156 (0.2611)	-0.7034
Aged 50 to 64	-0.6222* (0.0978)	1.1824* (0.2285)	-0.5602
No studies	-0.0443 (0.1126)	0.0449 (0.2677)	-0.0006
Primary	-0.0328 (0.0868)	-0.2715 (0.2188)	0.3043
High Secondary	0.1055 (0.1304)	0.4984 (0.2987)	-0.6039
Superior	0.0042 (0.1650)	0.1310 (0.4254)	-0.1352
Non HoH	-0.4299* (0.1045)	-0.5404 (0.2824)	0.9703
Married	0.2819* (0.0932)	-0.0354 (0.2419)	-0.2465
Dep. Child	0.0501 (0.0568)	-0.1908 (0.1341)	0.1407
Migrate	1.4943* (0.4803)	-	-1.4943
Unemployment	-1.9403* (0.4432)	-3.3051* (1.0899)	5.2454
Vacancies	0.8957* (0.2576)	0.8593 (0.6105)	-1.7550
Real wages	-0.00049 (0.00026)	-0.00015 (0.00061)	0.00064

Table 3C

-2 Log L	12159.683	
Degrees of Freedom	2029	
Likelihood Ratio	1854.71	prob = 0.9975
Sample size	7885	

Notes:

Standard errors in parenthesis

Figures in final column obtained from normalization requirement that the sum of the coefficient for each variable equal zero

* denotes significance at 95%

The likelihood ratio statistic compares the specified model with the unrestricted (saturated) model and it is an appropriate goodness of fit test for the model. Non-significance of the LR implies that the model fits.

Table 4A.
Choice Based ML Estimations of the Status of
previously Unemployed Individuals (1991)

Variables	Employed	Inactive	Unemployed
Constant	0.6411* (0.2510)	-1.5444* (0.5070)	0
Aged 16 to 19	0.8725* (0.0860)	0.3970* (0.1666)	-1.2695
Ages 20 to 24	0.7400* (0.0752)	-0.0314 (0.1486)	-0.7086
Aged 25 to 34	0.4078* (0.0669)	0.1555 (0.1193)	-0.5633
Aged 50 to 64	-0.6341* (0.0973)	0.8716* (0.1494)	-0.2375
No studies	-0.0266 (0.0960)	0.0353 (0.1700)	-0.0087
Primary	-0.0453 (0.0612)	-0.1202 (0.1206)	0.1655
High Secondary	0.4392* (0.0886)	-0.3541 (0.2081)	-0.0851
Superior	0.0650 (0.1095)	0.0347 (0.2167)	-0.0997
Female	-0.7068* (0.0463)	0.2861* (0.1042)	0.4207
Non HoH	-0.4793* (0.0704)	0.4539* (0.1433)	0.0254
Married	0.0960 (0.0595)	0.6045* (0.1119)	-0.7005
Dep. Child	-0.0499 (0.0484)	0.0966 (0.0928)	-0.0467
Migrate	1.0958* (0.3954)	0.7882 (0.7820)	-1.884
Unemployment	-2.1742* (0.4149)	-0.4782* (0.8114)	2.6524
Vacancies	-0.0885 (0.1500)	-0.3825 (0.3058)	0.471
Real wages	-0.00056* (0.00023)	-0.00173* (0.00048)	0.00229

Table 4A

-2 Log L	19026.458	
Degrees of Freedom	3634	
Likelihood Ratio	3682.43	prob = 0.2832
Sample size	11753	

Notes:
Standard errors in parenthesis
Figures in final column obtained from normalization requirement that the sum of the coefficient for each variable equal zero
* denotes significance at 95%
The likelihood ratio statistic compares the specified model with the unrestricted (saturated) model and it is an appropriate goodness of fit test for the model. Non-significance of the LR implies that the model fits.

Table 4B.
Choice Based ML Estimations of the Status of
previously Unemployed Women (1991)

Variables	Employed	Inactive	Unemployed
Constant	0.0890 (0.3718)	-0.4586 (0.6487)	0
Aged 16 to 19	0.7097* (0.1273)	0.3968 (0.2165)	-1.1065
Ages 20 to 24	0.5516* (0.1113)	0.1010 (0.1795)	-0.6526
Aged 25 to 34	0.2339* (0.0994)	0.3056 (0.1371)	-0.5395
Aged 50 to 64	-0.3887 (0.2037)	0.5997* (0.2207)	-0.211
No studies	0.0474 (0.1648)	0.1172 (0.2254)	-0.1646
Primary	-0.1749* (0.0833)	-0.0722 (0.1423)	0.2471
High Secondary	0.4768* (0.1127)	-0.3700 (0.2407)	-0.1068
Superior	0.1854 (0.1414)	-0.1722 (0.2800)	-0.0132
Non HoH	-0.3194* (0.1496)	-0.2761 (0.2535)	0.5955
Married	-0.1261 (0.0853)	0.8104* (0.1438)	-0.6843
Dep. Child	0.0172 (0.0699)	0.1912 (0.1166)	-0.2084
Migrate	1.6543* (0.6048)	0.7536 (1.1304)	-2.4079
Unemployment	-1.9661* (0.6230)	0.9908 (1.0207)	0.9753
Vacancies	-0.2622 (0.2192)	-0.5853 (0.3849)	0.8475
Real wages	-0.00058 (0.00033)	-0.00237* (0.00060)	0.00295

Table 4B		
-2 Log L	9569.8119	
Degrees of Freedom	1882	
Likelihood Ratio	1894.19	prob = 0.4172
Sample size	5967	

Notes:

Standard errors in parenthesis

Figures in final column obtained from normalization requirement that the sum of the coefficient for each variable equal zero

* denotes significance at 95%

The likelihood ratio statistic compares the specified model with the unrestricted (saturated) model and it is an appropriate goodness of fit test for the model. Non-significance of the LR implies that the model fits.

Table 4C.
Choice Based ML Estimations of the Status of
previously Unemployed Men (1991)

Variables	Employed	Inactive	Unemployed
Constant	0.1286 (0.3575)	-1.5461 (0.8643)	0
Aged 16 to 19	0.9450* (0.1217)	0.4971 (0.2802)	-1.4421
Ages 20 to 24	0.8436* (0.1056)	-0.2681 (0.2724)	-0.5755
Aged 25 to 34	0.5180* (0.0918)	-0.4660 (0.2574)	-0.052
Aged 50 to 64	-0.6463* (0.1130)	0.9624* -0.2232)	-0.3161
No studies	0.0013 (0.1246)	-0.0305 (0.2786)	0.02924
Primary	0.0632 (0.0908)	-0.2336 (0.2286)	0.1704
High Secondary	0.3554* (0.1427)	-0.2617 (0.4189)	-0.0937
Superior	-0.1214 (0.1710)	0.5614 (0.3571)	-0.44
Non HoH	-0.1693 (0.1242)	0.1453 (0.2961)	0.024
Married	0.5145* (0.1132)	-0.0337 (0.2638)	-0.4808
Dep. Child	-0.0729 (0.0692)	-0.2510 (0.1653)	0.3239
Migrate	0.7128 (0.5166)	0.7323 (1.0990)	-1.4451
Unemployment	-2.6014* (0.5636)	-2.3503 (1.3310)	4.9517
Vacancies	0.0616 (0.2084)	0.0564 (0.5022)	-0.118
Real wages	-0.00052 (0.00032)	-0.00065 (0.00079)	0.00117

Table 4C		
-2 Log L	9340.3069	
Degrees of Freedom	1722	
Likelihood Ratio	1671.89	prob = 0.8026
Sample size	5786	

Notes:

Standard errors in parenthesis

Figures in final column obtained from normalization requirement that the sum of the coefficient for each variable equal zero

* denotes significance at 95%

The likelihood ratio statistic compares the specified model with the unrestricted (saturated) model and it is an appropriate goodness of fit test for the model. Non-significance of the LR implies that the model fits.

Table 5A. Predicted Probabilities 1987

	Men			Women		
	ED	OLF	UED	ED	OLF	UED
Constant	0.4219	0.0446	0.5336	0.2057	0.1046	0.6897
Aged 16 to 19	0.4759	0.1474	0.3767	0.2672	0.1507	0.5821
Ages 20 to 24	0.5673	0.0334	0.3993	0.1941	0.1550	0.6509
Aged 25 to 34	0.5181	0.0372	0.4447	0.2457	0.1375	0.6167
Aged 50 to 64	0.2501	0.1607	0.5893	0.1930	0.1600	0.6470
No studies	0.4219	0.0446	0.5336	0.2648	0.1448	0.5904
Primary	0.4219	0.0446	0.5336	0.2057	0.1046	0.6897
High Secondary	0.4219	0.0446	0.5336	0.2551	0.0981	0.6469
Superior	0.4219	0.0446	0.5336	0.2244	0.0231	0.7524
Non HoH	0.3219	0.0523	0.6258	0.2197	0.0436	0.7367
Married	0.4917	0.0392	0.4691	0.1398	0.2738	0.5863
Dep. Child	0.4219	0.0446	0.5336	0.2057	0.1046	0.6897
Migrate	0.7648	0.0181	0.2171	0.2057	0.1046	0.6897
Unemployment	0.1017	0.0027	0.8955	0.2057	0.1046	0.6897
Vacancies	0.6412	0.0277	0.3311	0.2057	0.1046	0.6897
Real wages	0.4219	0.0446	0.5336	0.2057	0.1046	0.6897

Table 5B. Predicted Probabilities 1991

	Men			Women		
	ED	OLF	UED	ED	OLF	UED
Constant	0.4839	0.0907	0.4255	0.4011	0.2320	0.3669
Aged 16 to 19	0.7069	0.0515	0.2416	0.5766	0.1640	0.2594
Ages 20 to 24	0.6855	0.0552	0.2593	0.5376	0.1791	0.2833
Aged 25 to 34	0.6115	0.0682	0.3203	0.4583	0.2098	0.3319
Aged 50 to 64	0.2767	0.2590	0.4643	0.3369	0.3549	0.3087
No studies	0.4839	0.0907	0.4255	0.4011	0.2320	0.3669
Primary	0.4839	0.0907	0.4255	0.3599	0.2479	0.3932
High Secondary	0.5722	0.0751	0.3527	0.5190	0.1869	0.2947
Superior	0.4839	0.0907	0.4255	0.4011	0.2320	0.3669
Non HoH	0.4839	0.0907	0.4255	0.3273	0.2605	0.4121
Married	0.6106	0.0684	0.3210	0.3110	0.4045	0.2845
Dep. Child	0.4839	0.0907	0.4255	0.4011	0.2320	0.3669
Migrate	0.4839	0.0907	0.4255	0.7779	0.0860	0.1361
Unemployment	0.0650	0.1642	0.7708	0.0857	0.3541	0.5602
Vacancies	0.4839	0.0907	0.4255	0.4011	0.2320	0.3669
Real wages	0.4839	0.0907	0.4255	0.4013	0.2315	0.3671

Notes:

ED denotes employed; OLF denotes inactive; UED denotes unemployed

The dummy controlling for *gender*, in this case female, shows that it is a very important distinction with respect to transition probabilities. Women have a significant lower transition probability to employment than their male counterparts (around half of that of men). Moreover, the transition probability to inactivity is significantly higher for women, it more than double that of men. Women also tend to remain unemployed more than men.

The *head of household status* dummy variable has also relevant effects. Individuals who are not head of households are less likely to become employed than those who are

head of household. This is an effect completely due to males, as the male subsample corroborates. As to the transition probability to inactivity or non-participation, women who are not head of households see significantly reduced their likelihood of becoming inactive with respect to women who are head of households.

Marital status is another of the strongly significant effects in the transition probabilities of both men and women. Married individuals are more likely to become inactive than non-married individuals, this is an effect strongly dominated by gender distinctions. To be men and married has only a significant effect on the transition probability to employment by improving their chances. Married women have a lower likelihood of becoming employed, and their chances of becoming inactive are largely higher than non-married women, as well as than men, in general.

If we further interact the dummies of marital and head of household status we find important distinctive effects which are worth mentioning. The marital status of men who are head of household does not significantly affect their transition probabilities; however, for women who are head of household, married, and their spouse does not work, the transition probability to non-participation increases strongly. This could be due to the way the unemployment benefit system works: men with family responsibilities and no other person in the family working would be eligible to unemployment subsidy benefits. Individuals who are not married and non-head of household significantly see their transition probability to non-participation reduced for the case of both men and women, and their transition to employment also reduced for the case of men. For women, this effect is independent of the labour market status of the head of household, it is the same whether the head of household is employed, unemployed or inactive. For men, the reduction on both transition probabilities when they are single and non-head of household occurs when the head of household is either unemployed or inactive, but not when the head of household is employed. Women who are married and non-head of household significantly see their transition probability to employment reduced, this effect is independent of the labour market status of the head of household. To be a married man and non-head of household does not statistically affect their transition probabilities as

compared to men who are head of household and single.

To have dependent children in the household does not significantly affect the transition probabilities, neither for men nor for women. However, if we further interact personal characteristics we find that men who are head of household experience an improvement in their transition probability to employment if they have dependent children. Furthermore, married women see their transition probability to non-participation increased when they have dependent children in the household. The fact that an individual has migrated largely increases the likelihood of becoming employed, and it does not affect the transition to inactivity. The effect of mobility is mainly on men.

The *economic conditions* in the region of residence have also important and differential effects on the transition probabilities, and these effects are also different whether the individuals are men or women. The transition probabilities of women do not seem to be significantly affected by local economic conditions. However, the transition probabilities of men are significantly affected. Men who live in regions with higher unemployment rates see their transition probability to employment largely reduced, as well as their transition probability to inactivity. Men who live in regions with higher vacancy rates see significantly improved their transition probability to employment. The regional differences in real wages does not seem to have any relevant effect on the transition probabilities, neither for women nor for men.

All of these effects are with respect to a period, 1986 to 1987, in which unemployment was very high, around 21% (see Figure 1), but starting to decline. We now examine the main changes in the determinants of the transition probabilities to employment and out of the labour force occurred in a posterior period: the period from 1990 to 1991, in which the Spanish economy reached the lower level of unemployment since the first quarter of 1982.

The transition probability to employment improved substantially, in general and for both women and men, but more so for women. The transition probability to non-

participation or inactivity also increased, it doubled for both men and women. Therefore, the likelihood that an unemployed individual remained unemployed in 1990-91 largely fell as to 1986-87, due, of course, to the better economic conditions.

So, when the probability of leaving the unemployment pool increases, increases for both transitions, to employment and to non-participation. The increase to employment is mainly on women, and to non-participation on both men and women. It then seems that tough times induce people mainly to remain in the labour market despite the lower likelihood of becoming employed.

The age pattern on both transitions does not change from the period 1986-87 to the period 1990-91. The effect of education on the transition probabilities seems to change slightly. Individuals, either men or women, with intermediate or upper secondary educational level experience an improvement in their probability of becoming employed. The effect on the non-participation transition probability of higher levels of education seem to disappear. Higher levels of education seem now to affect men. The gender and marital distinction is still much the same. Women are less likely to become employed and more likely to become inactive than their male counterparts. Married individuals experience an improvement in their transition probability to employment, if they are men, and to non-participation, if they are women.

Individuals who are not head of households, experience a significant reduction in their transition probability to employment, and this is a female dominated effect. The dummy for non-head of households does not affect men transitions as it did in the 1986-87 period. Interacting further the head of household and marital status, as previously, we obtain the following results. Women who are head of household, whether married or not, do not experience significant effects on their transition probabilities. Women who are not head of household experience a statistically significant reduction in their transition probability to employment, independently on whether they are single or married. The effect if they are single, occurs when the head of the household, where they live in, is either unemployed or inactive (if the head of household is employed there is not a statistically significant effect). The effect if they are married, occurs if the head of household

is employed, in this case it also improves the transition probability to non-participation. Men who are head of household, as opposed to the period 1986-87, experience an improvement in their transition probability to employment if they are married, and more so if their spouse does not work. Married men who are not head of household, see their transition probability to employment improved, only in the case in which the head of the household, where they live in, is inactive.

To have dependent children does not have any significant effect, and comparing with the period 1986-87, only married women experience a reduction in their transition probability to employment when there are dependent children in the household. To have moved region of residence improves the transition likelihood to employment, this time mainly for the case of women.

Finally, local economic conditions effects on the transition probabilities to employment and non-participation of both men and women changed slightly. Individuals, both men and women, who live in regions with higher unemployment rates experience a substantial reduction in their transition probability to employment, as compared to the 1986-87 period, in which only men experienced this negative effect. Vacancy rates does not have any statistically significant effect as they did on men in the 1986-87 period. Women, not men, who live in regions with higher real wages experience a reduction in their transition probability to non-participation. Therefore, in the period 1990-91 local economic conditions have relevant and important effects on the transition probability of women as well as of men, compared with the 1986-87 period in which they only affected men.

V. CONCLUSIONS.

We have examined in this paper the transition probabilities to employment and non-participation at two different points in time: 1986-87 (period of high unemployment rates) and 1990-91 (the period of lower unemployment rate in the last twelve years). The purpose

of the paper was to examine the main determinants of these transitions and to examine whether the transitions to employment and non-participation are two distinctive behavioral transitions from the unemployment pool, that is, the factors that affect the probability of leaving unemployment are different whether the individual leaves unemployment to employment or to non-participation. The main results of this analysis can be summarised in the following main points.

First, the transition probability to employment increased substantially, in particular for women, from the period 1986-87 to the period 1990-91. Interestingly enough, the transition probability to non-participation also experienced a substantial, two-fold, increase for both men and women, despite the better economic conditions. It may be the case that the gloomy prospects were already beginning to show.

Second, the more important individual effect, on both transition probabilities, is gender. Women have different behavioral transitions to both employment and non-participation than men. Women have lower transition probability to employment than men, and higher transition probability to non-participation. Therefore, our results are presented separately for men and women.

Third, the factors that affect the transition probabilities to employment and non-participation are not necessarily the same, and when they are the same factors, their effects are in a different fashion.

All age ranges have a significant effect on *the transition probability to non-participation* in the case of women. For men, only the younger and the older are the more likely to move to non-participation. Education only affects this transition probability when the individual is a woman and has a high education level; however, in the 1990-91 period, does not seem to be a relevant variable at all. In the case of women, to be married, to be non-head of household (only in the 1986-87 period), and to have dependent children have a distinctive effect on the transition probability to non-participation. In the case of men,

only to be non-head of household and not married have an effect on this transition probability. As to local economic conditions, only the unemployment rate, for the case of men in the 1986-87 period, and the real wage, for the case of women in the 1990-91 period, have a significant effect.

The transition probability to employment is affected by all age ranges (in a u-shape) in the case of men. For the case of women, only the very young distinctively affect such probability. People with upper secondary levels of education have a higher transition probability to employment, particularly in the 1990-91 period. To be married affects the probability of moving into employment if the individual is a man. Non head of household who are men, in the 1986-87 period, and women, in the 1990-91 period, affect this transition probability. Regional mobility seem to increase the change of getting a job, and it does not affect the transition probability to inactivity significantly. Finally, the unemployment rate and the vacancy rate largely affect the likelihood of becoming employed.

Due to lack of data in the Spanish labour force survey about the previous labour market situation of the people who were unemployed previously and are now employed, we could not include in the analysis variables such as time unemployed, previous labour market experienced (i.e., worked before), previous economic sector and economic situation, etc. However, the next step in our research agenda is to carried further this analysis to examine the probability of leaving the labour force when previously unemployed. In this case we will have to control for sample selectivity bias (Heckman (1974)), and we will be able to extent our set of explanatory variables to include time out of work, previous labour market experience, unemployment benefits perceived, and so on.

APPENDIX A: The Multinomial Logit Model⁴

Categorical variables can be classified into two categories (e.g. mobility, participation) or into many categories (e.g. labour force status). The former are called binary or dichotomous variables, and the latter polychotomous variables. Polichotomous variables can be unordered (e.g. employed, unemployed, or inactive), sequential (e.g. no search, search with intensity, search without intensity) or ordered (e.g. first, second, third, etc.) In our analysis, our dependent variable is an unordered polychotomous variable. The model to examine unordered polychotomous variables is the Multinomial Logit Model (MLM):

Suppose we have m categories. Let $P_1 P_2 \dots P_m$ be the probabilities associated with these m categories. The idea is to express these probabilities in binary form. Let

$$\begin{aligned} P_1/P_1+P_m &= F(\beta_1'x) \\ P_2/P_2+P_m &= F(\beta_2'x) \\ P_{m-1}/P_{m-1}+P_m &= F(\beta_{m-1}'x) \end{aligned} \quad [1]$$

These implies $P_j/P_m = F(\beta_j'x) / (1 - F(\beta_j'x)) = G(\beta_j'x) \quad j = 1 \dots m-1$ [2]

Because $\sum_{j=1}^{m-1} P_j/P_m = 1 - P_m/P_m = (1/P_m) - 1$

we have $P_m = [1 + \sum_{j=1}^{m-1} G(\beta_j'x)]^{-1}$ [3]

and hence, from (2) $P_j = G(\beta_j'x) / [1 + \sum_{j=1}^{m-1} G(\beta_j'x)]$ [4]

⁴ See Maddala (1983), pp. 34-37, Theil (1969), and Schmidt and Strauss (1975).

One can consider the observations as arising from a multinomial distribution with probabilities given by (3) and (4). Although, any of the common distributions of u can be used, from the computational point of view the logistic is the easiest to handle. In this case $G(\beta_j'x)$ is nothing but $\exp(\beta_j'x)$. In this case the model is commonly referred as the multinomial logit model.

We can now consider the estimation of the MLM based on samples of size n . Each of the n individuals will fall into one of the m categories, with probabilities given by equations (3) and (4), where $G(\beta_j'x)$ is substituted by $\exp(\beta_j'x)$. Let x_i denote the vector of observations on the variables x for individual i . Then the probabilities P_{ij} ($j=1\dots m-1$) and P_{im} for the i th individual are obtained by substituting x_i for x in equations (3) and (4). We also define a set of dummy variables:

$$\begin{aligned} y_{ij} &= 1 \text{ if the } i\text{th individual falls in the } j\text{th category} \\ y_{ij} &= 0 \text{ otherwise} \end{aligned}$$

Then the likelihood function for the multinomial logit model can be written, in its logarithmic form, as

$$\log L = \sum_{i=1}^n \sum_{j=1}^m y_{ij} \log P_{ij} \quad [5]$$

because
$$P_{ij} = \frac{\exp(x_i' \beta_j)}{1 + \sum_{k=1}^{m-1} \exp(x_i' \beta_k)} \quad j=1\dots m-1$$

and
$$P_{im} = 1 / (1 + \sum_{k=1}^{m-1} \exp(x_i' \beta_k))$$

We get, on simplifying the relevant expressions,

$$\begin{aligned} \partial P_{ij} / \partial \beta_j &= P_{ij} (1 - P_{ij}) x_i \\ \partial P_{ij} / \partial \beta_k &= -P_{ij} P_{ik} x_i \quad j, k = 1 \dots m-1 \\ \partial P_{im} / \partial \beta_j &= -P_{ij} P_{im} x_i \end{aligned}$$

Hence, we have

$$\partial \log L / \partial \beta_k = \sum_{i=1}^{m-1} (y_{ik} - P_{ik}) x_i \quad [6]$$

Thus, the equations to solve for obtaining the Maximum Likelihood estimates are

$$\sum_{i=1}^n (y_{ik} - P_{ik}) x_i = 0 \quad k=1 \dots m-1 \quad [7]$$

The above equations are similar to those in the case of the simple logit model and can be interpreted similarly. For instance, if x_i consists of a constant term, then the predicted and actual frequencies will be identical for each of the m categories. Similarly, if x_i contains a dummy variable denoting, say, sex, then the predicted frequencies and actual frequencies will be identical for each of the two sex groups in each of the m categories.

The equations (7) are not linear in β_k , because P_{ik} is a nonlinear function of all the β 's. However, one can use some iterative procedure like the Newton-Raphson method, used in the SAS program. The matrix of second derivatives is easily seen to be negative definite. Hence, there is a unique maximum, and the iterative procedure converges to the maximum.

APPENDIX B: The data.

Individual Characteristics dummies

The data comes from the Spanish labour force survey (EPA: "Encuesta de la Poblacion Activa") years 1987 and 1991 (2nd quarters), provided by the "Instituto Nacional de Estadística" (INE-National Statistics Office).

The sample includes individuals, both men and women, who were unemployed a year ago. They can be currently employed, unemployed, or inactive. The dummy variables used in the analysis are defined in the following way:

Age We consider the following age groups:

people aged 16 to 19

people aged 20 to 24

people aged 25 to 34

people aged 35 to 49

people aged 50 to 65

Gender The sample is split between men and women.

Educational level. We consider the following categories:

Illiterate and no schooling

Primary education

Low secondary education

Upper secondary education

Higher education

Household composition. The persons living in a household are asked about their relationship with the household. Taking into account the organisation of the survey we constructed a coding system to be able to assign to each head of household variables such as wife working the previous year, children, children younger than 16, and children working the previous year.

If the individual is not head of household, we only know whether he is single or married, the labour market status of the head of the household where they are living in. In Table A1 we provide the sample frequencies of the individual variables.

Regional Economic Variables.

We assign to each individual his corresponding regional economic variables, according to his region of residence the previous year. It is important to emphasise that the survey data for the 2nd quarter of 1991 (or 1987) assesses the labour market status with respect to the 2nd quarter of the previous year. We assume that the individual makes the labour market status decision between both quarters taking into account the economic information of the year prior to the 2nd quarter of reference.

Therefore, the economic information relevant to the labour market status decision between 1990 (2nd quarter) and 1991 (2nd quarter) will be the one prevailing between the 2nd quarter of 1989 and the 1st quarter of 1990, both included. In the Tables labelled A2 the series under 1990, for example, are the average between 1989 (2nd quarter) and 1990 (1st quarter) and will be used as explanatory variables of the migration decision observed in the 1991 (2nd quarter) EPA.

The variables considered are:

Unemployment rate. Source: "Encuesta de Población Activa" (EPA) and "Series Revisadas EPA (1977-87)", INE.

Vacancies. The vacancy rate is defined as the ratio of the region's vacancies to the region's labour force. Source: "Estadísticas de Empleo", "Instituto Nacional de Empleo" (INEM).

Cost of living. The cost-of-living variable is the Consumer Price Index (IPC). Source: INE.

Real wage. The differential is taken to be the difference between the logarithms of regional real wages and national real wages. Source: "Contabilidad Regional de España" and "Encuesta de Salarios" (INE).

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