The regional distribution of unemployment. A microeconomic perspective.

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Abstract: Regional disparities in unemployment rates are large and persistent, particularly in some western economies such as Spain. Previous contributions to the literature have provided evidence on their magnitude and evolution, as well as on the role of some economic, demographic and environmental factors in explaining the gap between low and high unemployment regions. Most of these studies have used an aggregate approach. That is they have not accounted for the individual characteristics of the unemployed in each region. This paper aim at filling this gap, as it addresses the analysis of regional differentials in unemployment rates by using the information from the Spanish wave of the Labour Force Survey. An appropriate decomposition of the regional gap in the average probability of being unemployed allows us to tell the contribution of differences in the regional distribution of worker characteristics from that attributable to a different impact of these characteristics on the probability of unemployment. The results suggest that the well-known disparities in regional unemployment are not just the result of regional heterogeneity in the distribution of worker and job characteristics. Non-negligible differences in the probability of unemployment remain after controlling for that type of heterogeneity, as a result of differences across regions in the effect of the individual characteristics. Among the factors considered in the analysis, regional differences in the individuals endowment of human capital, and in its effect, play an outstanding role.

1. INTRODUCTION

Regional disparities in unemployment rates are sizeable and persistent in many countries (Blanchard and Katz, 1992; Decressin and Fatas, 1995, López-Bazo et al, 2002, Bande et al 2008, Cracolici et al, 2007, Filiztekin, 2009). Aside from the fact that labour markets remain essentially regional, there are reasons for considering unemployment from a regional perspective. Following Elhorst (2003) they can be summarised in i) the magnitude of regional differences between regions within countries, ii) the absence of explanations for the existence of regional unemployment disparities in macroeconomics, and iii) the inefficiency created by such disparities in the economy as a whole.

Most previous contribution in the literature (Elhorst 1995; Partridge and Rickman 1997; Taylor and Bradley 1997; López-Bazo et al, 2002, 2005) have aimed at analysing the determinants of regional unemployment by means of an aggregate specification in which the unemployment rate in each region is related to regional magnitudes proxying for both the disequilibrium and the equilibrium determinants of unemployment. It should be notice that this aggregate approach imposes the same effect in all regions to each variable, while only partially (and thus imperfectly) accounts for regional heterogeneity in individual, household, and job characteristics).

The expected effect of education on unemployment can be used to illustrate our argument. The level of education in a region is supposed to have a downward effect on its unemployment rate, as education improves individuals' probability of not being unemployed. Accordingly, the effect of education is estimated to be negative and significant in 6 out of the 9 studies summarized by Elhorst (2003), but it is no significant in the remaining three studies. The effect is positive, and in some cases significant for the set of Canadian regions in the study by Partridge (2001), and no significant for the Spanish regions in López-Bazo et al

(2002, 2005). Therefore, it seems to be some contradiction between the expected effect of education on individuals' probability of unemployment and the evidence from the empirical evidence obtained using micro-data, and (at least part of) the evidence from aggregate studies using regional data.

In this paper we aim at complementing the previous evidence on regional unemployment disparities obtained from studies using aggregate data, with results based on exploitation of information from micro-data. By using information for individuals in each region we assess the contribution of differences in endowments and in returns to characteristics that determine the probability of unemployment to the regional unemployment rate gap. It should be stressed that the decomposition of the gap between two groups of workers (men and women, natives and immigrants, etc) in a magnitude of interest (usually wages) has been standard practice in the labour economics literature since the seminal proposal of Oaxaca (1973) and Blinder (1973). However, the application of this methodology to the regional economics literature is scarce (exceptions include García and Molina, 2002 and López-Bazo and Motellón, 2009). In addition, the standard decomposition can only be applied to linear model. As a consequence, it is not suitable to decompose the gap in the probability of unemployment. Instead, we apply the generalized decomposition method suggested by Yun (2004), which allows the decomposition in the case of non-linear models. Such approach has recently been applied by Motellón (2008) to analyse the gap in the probability of being hired by a temporary contract in the Spanish regions. Finally, we focus special attention to the role of individual's education in explaining regional unemployment rate differentials.

2. DATA AND DESCRIPTIVE ANALYSIS

The data source in this paper comes from the second quarter of the Spanish Labour Force Survey (LFS) in the period from 1999 to 2009. The LFS published by the Spanish National Institute for Statistics allows obtaining information on the status of individuals in the labour market (non-participant, employed, unemployed) and personal and household characteristics (gender, nationality, age, education, occupation, industry, number and characteristics of household members, etc). The sample used for our analysis is composed by individuals aging between 16 and 65 years old in each of the 17 NUTS 2 regions in Spain, which are the historical and administrative regions with a high level of political and financial autonomy. It should be mentioned that the design of the sample in the LFS guarantees its representativeness at the regional level.

The unemployment rates in each of the regions and in the country as a whole at the beginning (1999), in the mid-point (2004) and at the end of the period under analysis (2009) are shown in Table 1. It also includes the average unemployment rate for each region and Spain in the complete period. These figures confirm that unemployment rate differentials across the Spanish regions are sizeable and persistent. Figure 1 summarizes the regional distribution of unemployment rates in Spain. High unemployment is localised in the South-West while the low unemployment rate regions are located in the North and East of the country, plus the capital city of Madrid.

Unemployment rates in regions such as Andalucía and Extremadura are systematically above the average in the country, while those for regions such as País Vasco, Navarra, Aragón, and La Rioja are steadily below the average. Actually, based on the average unemployment rates in the entire period 1999-2009 we define two groups of regions. The group of high unemployment rates (HUR) is composed by the first two regions mentioned above, whereas

the latter four regions compose the group with low unemployment rates (LUR). Table 2 shows that the gap in unemployment rates between the two regional groups is large and persistent, though it decreases somewhat over the period under analysis, from 16 to 12 percentage points.

These two groups of regions may have different unemployment rates because there are differences between regions in the distribution of individuals' characteristics that determine the individual probability of unemployment. That is to say, the regional gap in unemployment rates might be explained by differences in regional endowments of the above-mentioned characteristics. Following with the example in the introductory section, the gap between HUR and LUR groups would be explained by the lower educational attainment of individuals in the HUR regions. Actually, the simple description of the observable characteristics in the two groups of regions in Table 3 shows that, although there are not significant differences in some of them (gender, nationality, age), regions differ markedly in the endowment of some other determinants of the probability of unemployment. Briefly, it can be observed that HUR regions show lower educational attainment and greater family size.

Therefore, the key point is to know whether these endowment disparities explain most of the observed regional unemployment rate gap. To have some preliminary evidence on such issue, we computed the unemployment rate in each region within the categories of the observable characteristics. The results are summarized in Table 4. Were differences in the aggregate probability of unemployment between regions explained by the different distribution of endowments, we would not observe differences in that probability within each of the categories. This is against the evidence obtained in Table 4 as the probability is much higher in the HUR group for almost all the categories. This suggests that there can be a role for differences in the effect of the observed characteristics (i.e. their return) when explaining the

regional gap in unemployment rates. In the remaining sections we estimate those effects in each group of regions and decompose the unemployment rate gap in the contribution of differences in endowments and in returns to the characteristics.

3. METHODOLOGY

As in some previous studies (ref?????), our empirical setting assumes that the probability of being unemployed in a group of regions G (=HUR, LUR) depends on a set of endowments of the individual (such as gender, nationality, age and education), on household characteristics, and on the density of economic activity in each region:

$$\text{prob}(U=1)_G = \Phi(X_G \beta_G) \tag{1}$$

where prob(U=1) denotes the probability of unemployment, Φ the cumulative normal distribution function, X includes the above-mentioned characteristics, and β is the corresponding vector of coefficients.

From the probabilistic specification in (1), the difference in prob(U=1) at the first moment — i.e. the mean difference of prob(U=1)— between groups HUR and LUR can be decomposed as:

$$\overline{\text{prob}(U=1)_{HUR}} - \overline{\text{prob}(U=1)_{LUR}} = \left[\overline{\Phi(X_{HUR}\beta_{HUR})} - \overline{\Phi(X_{LUR}\beta_{HUR})}\right] + \\ \left[\overline{\Phi(X_{LUR}\beta_{HUR})} - \overline{\Phi(X_{LUR}\beta_{LUR})}\right] \tag{2}$$

where "over bar" represents the value of the sample's average. The first term in the RHS of (2), $\left[\overline{\Phi(X_{HUR}\beta_{HUR})} - \overline{\Phi(X_{LUR}\beta_{HUR})}\right]$, corresponds to differences in characteristics between individuals of different groups of regions, while the second term, $\left[\overline{\Phi(X_{LUR}\beta_{HUR})} - \overline{\Phi(X_{LUR}\beta_{LUR})}\right]$, is the effect of differences in coefficients.

The overall decomposition in (2) is thus of the form of the traditional Blinder (1973) and Oaxaca (1973) decomposition. But the non-linearity in $\Phi(.)$ prevents computing the particular contribution of each of the characteristics following the traditional decomposition. Instead, we follow the approach suggested in Yun (2004) in obtaining a detailed decomposition of the gap in the probability between the two groups of regions. In the case of our probabilistic specification, the detailed decomposition can be obtained from:

$$\overline{prob(U=1)HUR} - \overline{prob(U=1)_{LUR}} = \sum_{i=1}^{k} W_{\Delta X}^{i} \left[\overline{\Phi(X_{HUR}\beta_{HUR})} - \overline{\Phi(X_{LUR}\beta_{HUR})} \right] +$$

$$\sum_{i=1}^{k} W_{\Delta\beta}^{i} \left[\overline{\Phi(X_{LUR}\beta_{HUR})} - \overline{\Phi(X_{LUR}\beta_{LUR})} \right] \qquad (3)$$

where:

$$W_{\Delta X}^{i} = \frac{\left(\overline{X}_{HUR}^{i} - \overline{X}_{LUR}^{i} \right)\beta_{HUR}^{i}}{\left(\overline{X}_{HUR} - \overline{X}_{LUR} \right)\beta_{HUR}}, \qquad W_{\Delta\beta}^{i} = \frac{\overline{X}_{LUR}^{i} \left(\beta_{HUR}^{i} - \beta_{LUR}^{i} \right)}{\overline{X}_{LUR} \left(\beta_{HUR} - \beta_{LUR} \right)}$$

$$\sum_{i=1}^{k} W_{\Delta X}^{i} = \sum_{i=1}^{k} W_{\Delta\beta}^{i} = 1$$

Therefore, $W_{\Delta X}^{i}$ and $W_{\Delta\beta}^{i}$ allow to properly weight the contribution of each variable to the effects of the characteristics and of the coefficients. They can be computed by using the sample average of the characteristic of the LUR and HUR groups of regions, and the estimate of β for the two groups from the probit model in (1).

4. RESULTS

The first step in our assessment of the role played by differences in endowments and in returns is the estimation of the effects of the observed characteristics on the probability of unemployment in each group of regions. Marginal effects are computed based on the estimation of the coefficients in the probabilistic model in (1). The variables included in the model are those for the individual characteristics: gender, nationality, age, years of schooling as the proxy for education, marital status; and those accounting for the characteristics of the household: number of members, dummy for the head of the household, number of children, dummy for children under 9, and dummy for another employee. In addition, we have included an aggregate variable for controlling for density. Specifically, for each individual in the sample we control for the density of the province in which he/she lives.

Table 5 collects the estimated marginal effects (in the sample average) from the estimates of the probit model in the three years under analysis. It can be observed that most of the marginal effects for the categories of the individual characteristics are statistically significant and display the expected sign. Briefly speaking, being a male and having Spanish nationality reduce the chance of unemployment in both types of regions. Age and educational attainment reduce the probability of unemployment while being single increases the probability with respect to the others types of marital status in 1999 and 2004. In 2009, there is a positive and significant (at 5%) coefficient as well for being widow and divorced. As for the household characteristics there is greater heterogeneity in the significance of the estimated effects as they sharply varies across years and between the two groups. In any case, the relevance of those characteristics seems to be clearer in the case of the HUR group. Finally, the coefficient of density is only significant for the HUR regions in 1999 and 2009 and for the LUR group in 2009.

Above all, results in Table 5 confirm the existence of sizeable regional differences in the (marginal) effects of the observed characteristics. As a matter of example, an additional year of schooling reduces the probability of unemployment in the three years. But its effect is clearly more intense in the HUR group. This result suggests that regions have different unemployment rates because, as stressed in the previous section, there are regional differences in the distribution of individuals' characteristics (differences in endowments). But also because there is regional heterogeneity in their effect of on the probability of unemployment (differences in returns). Following the example on the role of education, the regional unemployment gap could be explained both by the fact the individuals in the HUR have lower educational attainment, and because the effect of education of individuals in those regions on the probability of unemployment is also higher.

The estimate of the coefficients of the probit models for the two groups in the years under analysis, and the sample averages of the observable characteristics in each group are used to compute the detailed decomposition in (3). It should be mentioned that the probit models where estimated including the parametric constraints suggested in Gardeazabal and Ugidos (200?) to guarantee the robustness of the decomposition to the omitted category for the discrete variables. The results of the decomposition are summarized in Table 6. The first row of data in that table shows the magnitude of the gap between the two groups in each of the years. It is simply the difference in the average probability of unemployment from the sample of individuals in each macro-region (showed in Table 2). The following rows of results are the part of the difference attributable to each characteristic, or sets of characteristics, distinguishing between the part corresponding to differences in the endowment and that from differences in returns.

It is observed the important contribution of differences in education, particularly since the mid nineties. In the last two years under analysis, the lower educational attainment in the HUR

regions explains around 2.5 percentual points of the gap of 12 percentual points. Interestingly, the size of the contribution of differences in the return to education is even greater, though the sign of this component is negative. To interpret the negative contribution of differences in the return to education, it should be kept in mind that the estimated effect is negative in the two groups and its effect is higher in the HUR group. Therefore, in regions with high unemployment, additional education reduces more intensively unemployment than it does in regions with low unemployment. This means that if the effect of education in HUR regions will reduce to that observed for the LUR group, the probability of unemployment among individuals with high levels of education in the HUR regions will increase, contributing to widen the regional gap in unemployment rates.

The contribution of differences in the endowment of other personal characteristics seems to be modest. But once again, a more intense contribution is related to the return of those characteristics, although it decreases over the period under analysis. As for the household characteristics, the difference in endowments plays against the HUR group, but the negative contribution of returns counterbalances that effect. A similar argument applies to the case of density.

Summing up, the results of the decomposition confirm the role played by regional differences in the effect of the observable characteristics. Its contribution is at least as intense as the one due to differences in endowments. They also support the hypothesis that regional differences in individuals education (both endowment and return) is a key ingredient to understand regional disparities in unemployment rates. In any case, it should be stressed that the gap attributable to differences in the constant term of the probabilistic model is very large. As we can assume that the constant term incorporates the effect of factors that do not vary across

individuals within each group of regions, this result should be read as evidence favouring the combination of results from both a micro and an aggregate perspective.

5. CONCLUDING COMMENTS

In this paper we have shown that the usage of micro-data allows adding further evidence on the knowledge of regional disparities to that obtained from studies using aggregate regional data. It allows more detailed control of regional differences in the distribution of personal, household, job, firm, and other individual characteristics. And it does not impose similar return/effect for the characteristics across regions. Furthermore, the decomposition of the regional gap in the magnitude under analysis allows assessing the contribution of regional differences in characteristics and in returns. This is particularly important to analyze, for instance, the contribution of education in explaining regional disparities.

In the case of the regional gap in unemployment rates in Spanish the results confirm that they are large and persistent, and that differences in endowments of individual and household characteristics can only explain partially that gap. Actually, regional heterogeneity in the effect of the characteristics on the probability of unemployment account for as much as the explanation attributable to endowments. Among the characteristics considered in the analysis, our results confirm the important role played by differences in education, endowment and return, across regions. Homogenization of levels of education and of its return will contribute to decrease the regional unemployment gap.

In any case, the large contribution assigned to the intercept of the probabilistic model suggests that the micro-analyses must be combined with evidence from aggregate data, in order to open the black-box behind the effect of the constant term. Improvements in the analysis include the treatment of the likely endogeneity of education (through the consideration of instrumental variables using information about the effect of the Spanish Civil War and the

post-war period, and the major change in the educational system in the seventies), sample selection (considering regional differences in participation rates, and its connection to education), and consideration of additional controls (industry, occupation, etc).

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Table 1. Unemployment rates in the Spanish regions.

	1999	2004	2009	Average
Spain	15,40%	11,08%	17,92%	11,52%
Andalucía	25,58%	17,43%	25,41%	18,46%
Aragón	9,69%	5,47%	13,01%	6,79%
Asturias	17,63%	10,42%	14,04%	11,12%
Balears	7,02%	9,14%	18,15%	8,64%
Canarias	13,70%	12,79%	25,74%	13,54%
Cantabria	14,96%	10,20%	11,70%	9,63%
Castilla y León	15,14%	10,93%	14,14%	10,63%
Castilla - La Mancha	15,09%	8,86%	19,52%	10,93%
Cataluña	10,54%	9,74%	15,87%	9,21%
Comunidad Valenciana	13,73%	10,18%	21,22%	11,29%
Extremadura	24,89%	17,94%	20,09%	17,60%
Galicia	16,28%	14,19%	12,93%	11,53%
Madrid	12,76%	6,81%	13,60%	8,47%
Murcia	14,04%	10,82%	20,16%	11,29%
Navarra	8,24%	5,38%	12,22%	6,19%
País Vasco	13,92%	9,50%	10,51%	9,17%
La Rioja	6,65%	4,86%	12,74%	6,97%

Table 2. Unemployment rates in the two macro-regions

	1999	2004	2009	Average
Spain	15,40%	11,08%	17,92%	11,52%
Region HUR	25,50%	17,49%	24,82%	18,36%
Region LUR	8,88%	5,36%	12,75%	6,65%

Table 3. Description of some characteristics in the two macro-regions

	1999		2004		2009	
	REGION HUR	REGION LUR	REGION HUR	REGION LUR	REGION HUR	REGION LUR
	Mean Std. Dev.	Mean Std. Dev.	Mean Std. Dev.	Mean Std. Dev.	Mean Std. Dev.	Mean Std. Dev.
Age						
16_19	0,04 (0,21)	0,03 (0,16)	0,03 (0,18)	0,02 (0,13)	0,03 (0,17)	0,02 (0,14)
20_24	0,13 (0,34)	0,10 (0,30)	0,11 (0,31)	0,09 (0,28)	0,09 (0,29)	0,07 (0,25)
25_29	0,15 (0,36)	0,14 (0,34)	0,14 (0,35)	0,12 (0,32)	0,12 (0,33)	0,10 (0,30)
30_34	0,14 (0,35)	0,13 (0,34)	0,13 (0,34)	0,14 (0,35)	0,13 (0,33)	0,13 (0,33)
35_39	0,14 (0,35)	0,14 (0,35)	0,14 (0,35)	0,14 (0,34)	0,14 (0,34)	0,14 (0,35)
40_44	0,12 (0,33)	0,13 (0,34)	0,14 (0,34)	0,15 (0,36)	0,14 (0,35)	0,15 (0,36)
45_49	0,10 (0,29)	0,12 (0,32)	0,11 (0,32)	0,13 (0,34)	0,14 (0,34)	0,14 (0,35)
50_54	0,08 (0,28)	0,11 (0,31)	0,09 (0,28)	0,10 (0,30)	0,11 (0,31)	0,12 (0,32)
55_59	0,06 (0,23)	0,07 (0,26)	0,06 (0,25)	0,08 (0,27)	0,07 (0,26)	0,09 (0,29)
60_64	0,03 (0,17)	0,03 (0,17)	0,04 (0,19)	0,04 (0,19)	0,04 (0,20)	0,05 (0,21)
Educational Att.						
Years Schooling	8,71 (4,24)	9,77 (4,14)	9,44 (4,19)	10,55 (4,03)	9,90 (3,95)	10,97 (3,88)
No Schooling	0,11 (0,31)	0,02 (0,12)	0,06 (0,24)	0,01 (0,10)	0,04 (0,21)	0,01 (0,10)
Primary	0,24 (0,43)	0,27 (0,44)	0,20 (0,40)	0,18 (0,39)	0,13 (0,33)	0,12 (0,32)
First Second	0,29 (0,46)	0,24 (0,43)	0,30 (0,46)	0,24 (0,43)	0,36 (0,48)	0,25 (0,43)
High School	0,09 (0,28)	0,10 (0,30)	0,10 (0,30)	0,11 (0,32)	0,11 (0,31)	0,14 (0,35)
Voc Training 1st level	0,05 (0,23)	0,08 (0,27)	0,08 (0,26)	0,10 (0,30)	0,09 (0,28)	0,11 (0,31)
Voc Training 2nd level	0,07 (0,26)	0,10 (0,30)	0,06 (0,24)	0,11 (0,32)	0,08 (0,28)	0,12 (0,32)
University 1st level	0,08 (0,27)	0,11 (0,31)	0,09 (0,29)	0,12 (0,33)	0,10 (0,30)	0,12 (0,33)
University 2nd level	0,07 (0,26)	0,09 (0,29)	0,09 (0,29)	0,12 (0,32)	0,09 (0,29)	0,13 (0,33)
Household Char.						
N members	4,07 (1,41)	3,63 (1,28)	3,76 (1,31)	3,37 (1,20)	3,51 (1,25)	3,24 (1,17)
Head of household	0,43 (0,49)	0,46 (0,50)	0,44 (0,50)	0,46 (0,50)	0,43 (0,50)	0,46 (0,50)
N children	0,70 (0,91)	0,53 (0,80)	0,62 (0,86)	0,51 (0,81)	0,60 (0,83)	0,57 (0,84)
Children under 9	0,27 (0,45)	0,22 (0,42)	0,25 (0,44)	0,23 (0,42)	0,26 (0,44)	0,24 (0,43)
Another employee	0,83 (0,87)	0,96 (0,85)	0,91 (0,90)	0,99 (0,84)	0,82 (0,79)	0,93 (0,77)
N Obs	17092	6233	16284	6113	16057	6837

Table 4. Unemployment rates within categories of characteristics

	1999 REGION HUR	1999 REGION LUR	2004 REGION HUR	2004 REGION LUR	2009 REGION HUR	2009 REGION LUR
Gender						
Male	19,40%	5,08%	12,67%	4,05%	23,42%	12,91%
Female	36,55%	15,68%	25,53%	7,46%	27,30%	12,78%
Nacionality						
Spanish	25,85%	8,65%	17,75%	4,81%	24,32%	10,00%
Inmigrant	21,04%	29,00%	16,15%	11,56%	31,58%	27,35%
Age						
16_19	48,35%	21,15%	36,80%	21,05%	62,35%	51,74%
20_24	39,06%	14,59%	26,99%	11,32%	40,64%	30,18%
25_29	31,22%	13,57%	20,48%	8,33%	29,61%	14,49%
30_34	23,87%	7,32%	16,63%	5,53%	23,03%	12,11%
35_39	21,77%	6,57%	14,27%	4,67%	22,12%	13,46%
40_44	19,42%	7,37%	14,20%	4,05%	20,90%	10,74%
45_49	17,30%	7,52%	14,55%	2,64%	19,78%	9,93%
50_54	16,47%	5,43%	13,80%	2,95%	19,42%	7,47%
55_59	22,95%	7,39%	14,63%	1,96%	20,65%	7,00%
60_64	19,19%	3,33%	12,52%	2,77%	16,32%	4,59%
Educational Att.						
No Schooling	32,56%	14,64%	24,84%	8,32%	36,84%	35,70%
Primary	26,46%	7,41%	18,91%	5,23%	33,57%	17,16%
First Second	27,51%	9,12%	20,64%	5,31%	30,90%	16,97%
High School	25,42%	13,02%	13,99%	5,23%	18,87%	13,25%
Voc Training 1st level	29,51%	9,41%	19,99%	3,63%	24,12%	13,84%
Voc Training 2nd level	24,53%	7,01%	14,64%	7,00%	18,72%	9,49%
University 1st level	17,71%	8,47%	10,39%	6,25%	13,36%	5,81%
University 2nd level	14,33%	10,20%	11,73%	4,94%	10,76%	6,46%
Marital Status						
Single	35,52%	12,75%	23,25%	8,32%	32,55%	18,65%
Married	19,77%	6,68%	14,20%	3,85%	20,65%	9,47%
Widowed	20,54%	10,05%	15,18%	2,70%	24,91%	14,31%
Divorced	28,24%	10,30%	17,85%	4,67%	23,96%	14,03%
Household Char.						
Head of household (=Y)	13,89%	4,50%	10,14%	3,18%	20,69%	10,66%
Head of household (=N)	34,98%	12,76%	23,58%	7,40%	28,50%	14,71%
Children (=Y)	22,72%	8,23%	15,82%	5,38%	23,99%	13,17%
Children (=N)	28,37%	9,44%	18,98%	5,43%	25,85%	12,67%
Another employee (=Y)	26,16%	9,82%	17,55%	5,60%	23,56%	11,84%
Another employee (=N)	25,24%	7,12%	17,89%	4,94%	27,65%	15,27%

Table 5. Marginal Effects from a probit model – prob(U)

	1999 HUR	1999 LUR	2004 HUR	2004 LUR	2009 HUR	2009 LUR
male	-0,1453 ***	-0,0816 ***	-0,1147 ***	-0,0280 ***	-0,0670 ***	-0,0157 **
Spanish	-0,0305	-0,1384 ***	0,0029	-0,0487 ***	-0,0596 ***	-0,1103 ***
e20_24	-0,0534 ***	-0,0257 *	-0,0365 **	-0,0194 *	-0,0969 ***	-0,0439 **
e25_29	-0,0861 ***	-0,0261 *	-0,0523 ***	-0,0320 ***	-0,1375 ***	-0,0847 ***
e30_34	-0,1116 ***	-0,0468 ***	-0,0722 ***	-0,0426 ***	-0,1663 ***	-0,0917 ***
e35_39	-0,1282 ***	-0,0569 ***	-0,0956 ***	-0,0412 ***	-0,1800 ***	-0,0914 ***
e40_44	-0,1538 ***	-0,0514 ***	-0,0971 ***	-0,0428 ***	-0,1926 ***	-0,1029 ***
e45_49	-0,1650 ***	-0,0558 ***	-0,0944 ***	-0,0463 ***	-0,2022 ***	-0,1039 ***
e50_54	-0,1650 ***	-0,0531 ***	-0,0923 ***	-0,0403 ***	-0,2009 ***	-0,1066 ***
e55_59	-0,1142 ***	-0,0367 **	-0,0810 ***	-0,0411 ***	-0,1922 ***	-0,1026 ***
e60_64	-0,1574 ***	-0,0503 ***	-0,1054 ***	-0,0376 ***	-0,2085 ***	-0,1013 ***
Schooling	-0,0167 ***	-0,0022 **	-0,0140 ***	-0,0009	-0,0237 ***	-0,0099 ***
Single	0,0438 ***	0,0319 ***	0,0414 ***	0,0169 **	0,0454 ***	0,0339 ***
Widowed	-0,0389	0,0469	-0,0077	0,0021	0,0432	0,0770 **
Divorced	0,0291	0,0479 **	0,0152	0,0171	0,0318 **	0,0371 **
N members	0,0228 ***	0,0042	0,0035	0,0004	0,0211 ***	0,0081 *
Head Household	-0,1036 ***	-0,0224 **	-0,0717 ***	-0,0162 **	-0,0161 **	-0,0062
N children	-0,0141 **	0,0086	0,0035	0,0080	-0,0268 ***	-0,0018
Children under 9	-0,0050	-0,0114	0,0002	-0,0037	0,0297 **	0,0020
Another employee	-0,0608 ***	-0,0073	-0,0348 ***	-0,0042	-0,0536 ***	-0,0158 ***
Density	0,0002 ***	0,0003	0,0001	0,0001	0,0002 ***	0,0005 **
Obs	17092	6233	16284	6113	16057	6837
LR (chi2)	1965,16	319,06	1302,15	176,79	1594,72	523,55
prob>chi2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000

Table 6. Unemployment rate gap decomposition

	1999		2004		2009	
Gap	0.1662		0.1213		0.1207	
	Endowment	Return	Endowment	Return	Endowment	Return
Education	0.0170	-0.0759	0.0270	-0.0483	0.0250	-0.0477
Age	0.0091	0.0014	0.0101	-0.0007	0.0093	0.0000
Personal Ch.	0.0005	0.0889	-0.0013	0.0451	-0.0025	0.0399
Household Ch.	0.0180	-0.0115	0.0105	-0.0149	0.0106	-0.0143
Density	0.0099	-0.0121	0.0084	-0.0227	0.0080	-0.0213
Constant	0.1291		0.1271		0.1200	

Figure 1. Spatial distribution of unemployment rates