Mobility, wages and gender across Europe

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Abstract:

In this paper, the socioeconomic and individual characteristics that favor mobility are analyzed. The stochastic frontier technique is used as an instrument of analysis to measure the differences that arise between the potential wage and the one that should be obtained for an individual with particular socioeconomic characteristics given his/her investment in human capital. A data panel of young workers who have been working at least for seven consecutive years is used for this analysis. The data set comes from the European Community Household Panel for the period 1995-2001. The results show that Spanish and Italian women have the higher changing probability; this high probability has a negative effect on the potential wage because it increases the gap between the potential and the observed wage.

JEL: J31, J63, J71
Key words: Wage differentials, mobility, Europe, labor economic.

1. Introduction

The recent crisis has exacerbated the imbalances on the labour markets in the euro area. Unemployment figures in Spain remain at record highs whilst other euro countries are unable to satisfy their demand for skilled workers. The potential for internal labour migration is particularly high among young, well-qualified workers, who are especially hard hit by high unemployment in the peripheral countries despite their good qualifications. Immigrations from the euro periphery to Germany are likely to increase in the coming years given the relatively promising employment outlook in that country.

Nowadays in Spain some people enhanced mobility as a way of solving some part of the extraordinary high level of unemployment. Migrations to a higher paid job are also a human capital investment since it entails present sacrifices to obtain higher future earnings. During the 1950s and 1960s workers from Italy and Spain migrated to the core European countries. Since the 1990's these movements have evolved from outward into inward migration countries. The boom increasingly drove by growth in sectors with heavy demand for low-skilled workers, such as the construction industry, services and tourism, attracted massive inward migrations flows. But after the slowdown of 2007 European unemployment increased very fast, particularly in Spain.

This paper analyses the determinants of mobility for young workers, from another area region or country. These young people have been selected with the following characteristics: to have a job, at least, for seven consecutive years without interruptions; to be younger than 40 and to work a minimum of 15 hours per week. These sample selection is important to ensure a strong commitment of these young people towards work. To achieve that goal, firstly, the personal and socioeconomic factors that affect mobility are analyzed and secondly, how this mobility increases the efficiency of obtaining better results in the labor market by comparing wages of both women and men with and without mobility. A stochastic frontier approach is used as an alternative method that includes one-sided error term to capture the possibility of inefficient behaviour of an economic unit when trying to reach an economic objective, LOVELL, 1993. The frontier approach is usually

applied to the analysis of inefficiency in firms' production. This methodology is very adequate to explain wage's differentials, that is, the differences between the potential and the observed wage that an individual could obtain, given his or her human capital investment. The earnings frontier will describe the highest potential income associated with a given stock of human capital. If a worker earns less than the potential wage, the difference in wages indicates inefficiency in the transformation of human capital variables (schooling, experience and tenure) into earnings, and also the differences between the potential and the effective wage maybe analysed in terms of the factors they are affected by. In this approach, the focus is set in the differences in the wage gap among men and women that have experienced labour mobility. There is a growing literature in which the stochastic frontier approach is used to estimate earning functions. Attempts to measure discrimination include, among others, the work of ROBINSON et al., 1989; ROBINSON, 1993; HUNT-MCCOOL et al., 1993; SLOTJE et al., 1994; DAWSON et al., 2001, and BISOHP et al., 2007.

It is a known fact that women earn less than men. Even when controlling for human capital endowment and other personal characteristics this result persists. The huge gender gap literature[ii] has tried to explain the factors that account for this difference in earnings. In particular, literature has showed that differences in human capital accumulation could explain a fraction of the earnings gender gap. Different decisions related to education, commitment to labour market and types of occupation lead women to work fewer hours and accumulate less experience than men, reducing their human capital endowment and their potential wage and explaining a part of the earnings gender gap. In this paper it is shown that, even though, Spanish or Italian women have a higher probability of moving from one position to another, this mobility doesn't reduce the inefficiency of getting better wage in the labour market. In this sense, ALTONJI et al., 1992, found that women are more likely to adjust their working hours when they change jobs as they face major family responsibility. Also, it can be seen that wages are less important in the decision to change jobs for women than for men. In Spain gender differences in job mobility have been studied by GARCIA-CRESPO, 2001, that focuses on gender differences in promotions, and CAPARRÓS et al., 2004, that study mobility and wage discrimination. SERRANO-

PADIAL, 2007, and HOSPIDO, 2009, establish the analysis on the relationship between job mobility and wages using the data from ECHP, the same data set used in this paper.

The paper is organised as follows: Section 2 analyses the stochastic frontier methodology and its application to the earning functions. Section 3 shows the data set and the variables. Section 4 provides a discussion of the results. Finally, in Section 5 concluding remarks are set up.

2. The stochastic frontier.

In this work the stochastic frontier approach developed by AIGNER et al., 1977, is applied to estimate an earning frontier, adding to the standard earning equation an asymmetric error term representative of wage inefficiency. Specifically, a panel data version of this approach is used, following the random effect model of PITT and LEE, 1981, who showed how a time invariant composed error model, could be extended to a panel data version of the stochastic frontier model. Moreover, heterogeneity in the mean of the inefficiency term that has a truncated normal distribution is included, as suggested by STVENSON, 1980. That is, wage inefficiency is estimated and explained by a set of variables[iii]. This approach avoids the inconsistency problems of the two-stage procedure when analysing the inefficiency determinants[iv].

A standard semi-logarithmic earnings equation following MINCER, 1974, is adopted and is assumed that the potential or theoretical wage could differ from the observed wage, that is, workers might not be able to transform the whole of their human capital stock into earnings. This difference is called “wage inefficiency” and it is included in the analysis through the addition of a one-sided error term to the standard earning function, obtaining a frontier. Simultaneously the determinants of this wage inefficiency (the inefficiency model) are estimated.

The estimated model is:

$$\ln W_{it} = \ln W^{*}_{it} - u_i = \alpha + \beta' X_{it} + v_{it} - u_i \qquad (1)$$

Equation 1 shows the earnings frontier, which describes the highest potential income associated with a given stock of human capital. Then, W^* is the potential or theoretical wage, β the set of parameters and X the set of human capital variables. A composed error term is included: the first component, v_{it}, is a two-sided term representing the random error, assumed to be iid N(0, σ_v^2) and the second component, u_i, is a non-negative random variable representing the inefficiency, which is assumed to be distributed independently as N(μ_i,σ_u^2).

The difficulty of transforming individual characteristics into outcomes is measured by the ratio of observed wage over the maximum or potential wage obtainable for an individual (when there is no inefficiency); the efficiency (EF) of an individual is[v]:

$$EF = \frac{f(X_{it};\beta)\exp(v_{it} - u_i)}{f(X_{it};\beta)\exp(v_{it})} = \exp(-u_i) \tag{2}$$

The scores obtained from Equation (2) take value 1 when the individual totally transforms their characteristics into earnings and less than 1 otherwise.

The mean of the inefficiency term (μ) is a function of variables that could explain the difficulties of transforming human capital into market earnings.

$$\mu_i = \delta_0 + \delta' Z_i \tag{3}$$

Here, Z_i is a (Mx1) vector of variables that could explain the degree of inefficiency in the transformation of human capital into earnings, and δ' is a (1xM) vector of parameters to be estimated.

Then, the earning function is estimated, adding a term of inefficiency whose mean is a function of a set of inefficiency determinants. The function coefficients (β) and the inefficiency model parameters (δ) were estimated using a panel data technique to control for unobserved heterogeneity.

3. Description of the data.

The European Community Household Panel (ECHP) is a harmonized cross-national longitudinal survey focusing on household income and living conditions. The ECHP is a standardized questionnaire that involves annual interviewing of a representative panel of households and individuals in each country. The analysis is carried out for the corresponding balanced panel of wage earners currently working 15 or more hours per week, from 1995 to 2001. The number of observations by country is: Italy with 1,484 (212 individuals), Spain with 1,169 (167), Germany with 3,745 (535 individuals) and United Kingdom with 2,653 (379 individuals).

These samples are young employed people with ages ranging from 18 to 40 years who have been working at least for seven consecutive years. The dependent variable is the hourly wage. As usual, the individuals that report an extremely high or low record for wages, working hours or other relevant variables are deleted.

The percentages of female workers in the sample ranged from Germany (37.6%), which had the highest percentage, to Spain (16.8%), which had the lowest. The average age, range from 31.6 years for Italy to 33.1 for Spain. A sample selection of young working people is established and this selection increased the average level of education for both men and women. The proportion of workers with a higher education degree in the sample ranged from the United Kingdom (54.8%), which had the highest percentage, to Italy (8.4%), which had the lowest. Mobility allows workers to obtain a better fit in the labor market, so this variable contributes to explain the potential wage. The main results are that on average, 58.5% of young workers in United Kingdom were willing to relocate, followed by Spain with 50%, while the percentages were lower for Germany (38.7%) and Italy (40.2%). By comparing the differences in type of contract, we found that Spain had the lowest percentage of permanent workers. In ECHP, seniority is defined as the number of years working to the same employer and here the values are: UK with a mean of 6, Germany 7.8, Italy 10.7 and Spain 11.10 years.

4. Mobility and wages.

First of all, the socioeconomic and individual characteristics that favor mobility are analyzed. The analysis is focused on young workers who have been working at least for seven consecutive years in the same place using this information as a sign of mobility. For the time period considered a random effect probit model is estimated, where the dependent variable indicates whether the individual have moved from previous area, region or country. The explanatory variables express the workers socioeconomic and human capital characteristics. Secondly, it is important to consider the advantages generated by mobility as a mean of transforming the potential wage when measured in terms of human capital. In order to get that information we apply the stochastic frontier technique using data for four countries, Germany, Spain, United Kingdom and Italy. Once the results are achieved, comparisons are established among them.

4.1. The determinants of job mobility.

The maximum likelihood estimates of random effects probit model are presented in Table 1.

[Insert Table 1]

As it is already said a balanced random effect probit model to study the determinants of mobility is estimated. The dependent variable is a dummy that takes value 1 if the individual has moved from another area, region or country 0 otherwise. To be older than thirty increases the probability of a change in the residence of the household for young Italians, British and Spaniards but Germans don't exhibit that characteristic.

When comparing primary to secondary education, it can be observed that having primary education reduces the probability of change for Spaniards but increases that of the Germans. Otherwise, college education compare to secondary education only increases the probability of change for British youngsters. People with high education qualifications show the lowest probability level of a change, given the greatest opportunities of those jobs in their country, region, etc.

An outstanding result is the particular case of both Italians and Spaniards women, in these countries to be a woman increases the probability of a change when comparing this same probability for men. One possible explanation is the classical one that women have more problems when looking for a job and not only that but also lower wages, both problems together may have an influence producing a high mobility. Another interesting result is given by the fact of being married. To be married increases mobility for the four countries considered. There is also an interesting result for the British. For them, to have children below twelve have a positive effect on the probability of a change, being just the opposite for the other countries analysed.

Surprising different results are obtained, therefore, to be unemployed at least for twelve months, increases Italians mobility but reduces that of the Germans. Considering the kind of contract, it is verified that it is not relevant but for the Spanish workers, in particular, for this country a permanent contract increases the probability of a change. The size of the firm affects German workers, for them to be in a firm with more than 500 employee's increases their mobility, but in the other countries workers are not affected by this fact.

Married people are also willing to change job, if that change means an improvement, giving the greatest responsibility of their situation (being in charge of dependent people, children etc.) The above mentioned results show a twofold effect, on the one hand mobility is greater for individuals with a high level of qualifications but on the other hand it is also greater for individuals with insertion problems, situation which is more frequently face by women in the labor market.

4.2. Mobility and wages by gender.

The maximum-likelihood estimates of the earning frontier parameters, defined in equation (1), given the specification for the inefficiency effects, defined in equation (3), are presented in Table 2. At the end of table 2 it is shown the average level of wage inefficiency and the variance model components estimated by the statistical package. The relevance of the inefficiency effects is tested using the generalised likelihood ratio (LR) test[vi].

[Insert Table 2]

The lambda parameter indicates that inefficiency is stochastic and thus, the frontier model cannot be reduced to a mean-response wage equation (OLS estimation). The generalised likelihood ratio test reported in Table 2 reinforces the relevance of the inefficiency effects in the model. The obtained results reject the null hypothesis, which considers that inefficiency effects are not present in the model.

For the analysed period, the estimated degree of wage inefficiency is around 15% for Italy, 19% for Germany, 38% for Spain and 12 % for UK. This means that, on average, these European young workers obtained a salary that was lower than the salary they could have achieved given their human capital and other personal characteristics. Human capital variables were significant and had the expected sign. In this work there are two sets of variables that show the effect of age and education related to the potential wage of the individuals.

Age is only significant in the case of Germany and Spain, where being older than 30 years increased the potential wage by 0.5% compared to be younger than 30 in Germany and 1% in Spain. For Italy and UK this variable is not significantly different from zero, that is, it has not impact in the determination of wages for young workers

Also, as expected, having primary education reduced the potential wage that an individual could obtain with respect to secondary education in Italy and Germany while has not a significant impact in Spain and UK. It is verified that to have higher education increase the potential wage of Italy Germany and Spain while it does not happen for UK. With the occupational variables, wage differentials generated by differences in occupations are controlled. The reference category was elementary occupations. The sign obtained is the expected one; the potential wage is higher as the occupational skills increased.

In absence of discrimination, gender is a variable that should not affect the potential earnings of individuals. However, the sign of this variable in the estimation is negative and significant. That means that to be a woman reduces the potential available earnings related to be a man. In this type of estimation, the coefficient of this variable measures the extent

of the wage discrimination against women. The results give a negative and significant coefficient for Italy, Germany, and Spain but not for UK, where the coefficient is negative and insignificant. Germany is the country where the reduction in the women potential wage is higher (33%). In DIAZ et al., 2011, the gender coefficient was estimated in the inefficiency model. Also they obtained different results among Anglo-Saxon and Southern countries. Some part of these differences could be explained by the higher wage inequality, decentralized collective bargain and higher female employment of the former.

As another source of wage differentials the variable type of contract is included. Two categories are established: permanent contract and other type of contract, inside this category, temporary contract, which accounted for the higher number of individuals, and was considered the reference category. Spain is the country with the highest level of temporality especially for young workers as it was analysed by DIAZ et al., 2008. The results achieved show that this coefficient is positive and significant for Germany and Spain.

Large firms tend to pay higher wages than small and medium-sized firms. Large firms might be more efficient in organising the work, in selecting employees and in adopting new technologies. This increases labour productivity, thus raising wages. The dummy of firm's size affected the workers' potential wage positively and significantly in the case of Germany, Spain and UK.

The estimated frontier defines the highest wage that an individual could obtain according to his or her human capital investment (potential wage). The wage inefficiency measures the distance to the frontier for each individual, that is, the difference between the potential and the observed wage. It is assumed that this wage inefficiency is a function of mobility for gender; a set of two dummies that reflect women and men mobility are included. The category of reference is no mobility. The estimated parameters of the inefficiency model indicate only the direction of the variables' effect on inefficiency. The value of these parameters is presented at the end of Table 2.

The inefficiency model shows that the coefficients of women' mobility dummies indicate that they have a positive and statistically significant impact only for Germany. The

positive sign indicates an increment in the distance to the stochastic frontier, that is, an increase in the difference between potential and effective wage. In the case of men they have the opposite sign, indicating that mobility reduces the distance to the stochastic frontier what means a reduction between potential an effective wage. These coefficients are significant for Germany, Spain and UK but not for Italy, where, mobility for men and women has not a significant impact on wages.

5. Concluding remarks.

This paper studied the implications of mobility covering two aims, first, which are mobility determinants and second, how these determinants affects wages, in order to answer both problems the stochastic frontier approach is applied. The results show several singular factors.

To carry out the inefficiency analysis, as it is already mentioned, the stochastic frontier technique is used to see how close to the potential wage could the individual be, given all the characteristics analyzed. For German women, it is observed that job mobility increases inefficiency, measured as closeness to the potential wage, when compared with those that have no mobility. This result reinforces the basic idea that women' mobility is driven by her husband professional careers and it is not an action to improve their own working trajectory. When the analysis is conducted just for men, it can be appreciated that mobility reduces the inefficiency gap for all the countries in the sample but for Italy, in fact Italians show no incidence on this factor regardless their mobility.

All in all, in this paper it is accomplished that for women mobility doesn't generate earning wages, yet for men it is dramatically different, given the fact that mobility reduces the differences between the potential and the observed wage. Once again this result confirms that men make decisions rationally, when considering job mobility, just to improve their conditions, the reverse is true for women, as a matter of fact, women don't show that behavior related to job mobility.

Appendix: Description of variables.

The dependent variables used for estimation are:

-Mobility, that is a dummy variable that takes value one when the individual have moved to a new place, area or country and zero otherwise. This is the dependent variable for the Probit model.

-The logarithm of gross hourly wage for the Stochastic Frontier.

The explanatory variables of the wage equation are:

Age: This is a set of two dummy variables:

Age1: equal to 1 if individual is younger than 30 years, zero otherwise, (reference category).

Age2: equal to 1 if individual is older than 30 and 0 otherwise.

Education Classification: This is a set of three dummy variables:

Primary: Less than upper secondary education: equal to 1 if the individual has less than second stage of secondary education (ISCED 0-2).

Secondary: Upper secondary education: equal to 1 if individual has finished the upper secondary level of education (ISCED 3) and 0 otherwise.

Higher Education: Tertiary education: equal to 1 if individual has finished tertiary education (ISCED 5-7) and 0 otherwise, (reference category).

Occupation in current job: This is a set of eight dummy variables:

Legislators, senior officials and managers

Professionals

Technicians and associate professionals

Clerks

Service workers and shop and market sales workers

Craft and related trade workers

Plant and machine operators and assemblers

Elementary occupations (reference category)

Type of contract: Dummy variable equal to 1 if the worker has a permanent contract and 0 otherwise (fixed-term contract or a non-standard contract).

Firm size: Large firms, equal to 1 if the firm has more than 500 workers and 0 otherwise.

Private sector: This dummy takes value one if the individual works in a firm that belongs to the private sector, zero if belongs to public sector.

Seniority: Number of years working with the same employer.

Trend: Time trend.

The inefficiency model:

Women's Mobility: Dummy variable equal to 1 if women have moved to another place, area or country and 0 otherwise.

Men's Mobility: Dummy variable equal to 1 if men have moved to another place, area or country and 0 otherwise.

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Table 1: Maximum Likelihood Estimates of Random Effects Probit Model of Mobility for Italy, Germany, Spain and UK.

	Italy		Germany		Spain		UK	
	Coefficient	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**
Constant	-4.424*	-7.822	-1.759*	-7.360	0.528	0.618	2.648*	3.778
Age. Category of reference: Less or equal than 30								
Older than 30	0.733*	4.269	0.018	0.270	0.923*	3.096	0.387*	3.748
Level of education by countries. Category of reference: Higher Education								
Primary	-0.413	-1.348	0.425*	3.579	-1.482*	-3.814	-0.233	-1.341
Higher	0.276	0.672	0.077	0.706	0.122	0.350	0.375*	2.480
Occupation in current job. Category of reference: Elementary occupations.								
Legislators, seniors officials and managers	0.267	0.136	-0.209	-0.887	-0.742	-0.779	-0.384	-0.685
Professionals	-0.574	-1.062	0.320	0.179	-1.379*	-2.112	-0.691	-1.188
Technicians and associate professionals	0.187	0.537	0.313**	1.930	-0.839	-1.766	-0.409	-0.709
Clerks	-0.839*	-2.199	0.382*	2.192	-0.638	-1.055	-0.807	-1.340
Service workers and shop and market sales workers	0.530	1.137	0.232	0.997	-1.318*	-2.007	-0.238	-0.394
Craft and related trade workers	0.268	0.996	0.426*	2.579	-0.416	-1.152	-0.157	-0.266
Plant and machine operators and assemblers	-0.129	-0.243	0.350	1.770	-0.171	-0.252	-0.628	-1.002
Gender. Category of reference: Men.								
Female	0.623**	1.985	-0.130	-1.328	1.246*	2.537	-0.072	-0.512
Marital Status. Category of reference: Single.								
Married	4.458*	10.703	0.150**	1.920	3.459*	5.802	0.406*	3.811
Children under twelve: Category of reference: No children								
Children under twelve	-0.237	-0.851	-0.241	-0.601	-0.241	-0.601	0.292*	2.739
More than 12 months unemployed before to obtain this job								
Unemployed	0.560*	3.507	-1.255	-5.155	-0.242	-0.590	-2.078	-1.063
Type of contract. Category of reference: Other type of contract different to permanent								
Permanent	-0.033	-0.010	0.007	0.045	1.553*	4.257	-0.687	-1.344
Private sector of activity. Category of reference: Public sector								
Private sector	1.357*	5.131	0.017	0.230	-0.647	-1.768	0.414*	3.120
Number of regular paid employees in the local unit in current job. Category of reference Less than 500 workers.								
More than 500 workers.	0.718	1.630	0.171*	2.373	-0.267	-0.922	-0.093	-0.937
Seniority with the same employer								
Seniority	-0.741*	-3.329	0.013	1.580	-0.354*	-7.124	-0.134*	-10.989

Table 1 (cont.): Maximum Likelihood Estimates of Random Effects Probit Model of Mobility for Italy, Germany, Spain and UK.

	Italy		Germany		Spain		UK	
	Coefficient	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**
Rho	**0.948**	**117.667**	**0.947**	**180.724**	**0.961**	**117.95**	**0.925**	**139.281**
Log likelihood function	**-382.8060**		**-1382.119**		**-315.9859**		**-895.8359**	
Restricted Log likelihood	**-853.5619**		**-2438.009**		**-731.2261**		**-1733.230**	
Chi- Squared	**941.5118**		**2111.780**		**830.4803**		**1674.787**	
N	**1484**		**3745**		**1169**		**2653**	

(*) Significant at 1%; (**) Significant at 5%.

Table 2: Wage frontier estimates for Italy, Germany, Spain and UK.

	Italy		Germany		Spain		UK	
	Coefficient	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**
Wage frontier estimates								
Constant	7.654*	67.737	7.874*	40.023	11.669*	37.363	1.051*	2.153
Trend	0.048*	25.124	0.024*	13.533	0.046*	11.081	0.029*	28.297
Age. Category of reference: Less or equal than 30								
Older than 30	-0.012	-0.963	0.050*	5.349	0.111	6.315	0.008	1.642
Level of education by countries. Category of reference: Higher Education								
Primary	-0.033*	-2.917	-0.038*	-3.526	-0.032	-1.681	0.009	1.250
Higher	0.257*	10.221	0.101*	11.413	0.149*	8.671	0.010	1.657
Occupation in current job. Category of reference: Elementary occupations.								
Legislators, seniors officials and managers	0.017	0.243	0.200*	14.960	0.493*	7.613	0.036*	2.999
Professionals	0.087	1.607	0.220*	17.716	0.383*	14.571	0.045*	3.817
Technicians and associate professionals	0.031	1.148	0.057*	5.469	0.188*	7.013	0.035*	2.727
Clerks	0.082*	3.561	0.009	0.846	0.013	0.430	0.138	1.184
Service workers and shop and market sales workers	-0.024	-1.050	0.003*	0.198	0.043	1.303	-0.014	-0.986
Craft and related trade workers	0.004	0.194	-0.056*	-5.009*	-0.005	-0.214	0.169	1.609
Plant and machine operators and assemblers	0.015	0.538	-0.026*	-2.029	-0.037	-1.499	0.012	1.037
Gender. Category of reference: Men.								
Female	-0.304*	-11.305	-0.330*	-39.465	-0.237*	-12.892	-0.033	-1.320
Type of contract. Category of reference: Other type of contract different to permanent								
Permanent	0.019	1.103	0.291**	1.890	0.109*	5.484	0.004	0.574
Private sector of activity. Category of reference: Public sector								
Private sector	0.019	0.943	0.083*	11.944	-0.049*	-3.390	-0.007	-1.024
Number of regular paid employees in the local unit in current job. Category of reference Less than 500 workers.								
More than 500 workers.	-0.010	-0.572	0.099*	15.592	0.079*	4.442	0.019*	4.333
Seniority with the same employer								
Seniority	0.004*	3.332	-0.000	-0.350	0.004*	2.782	-0.000	-1.590

Table 2 (cont.): Wage frontier estimates for young workers of Italy, Germany, Spain and UK.

	Italy		Germany		Spain		UK	
	Coefficient	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**
Inefficiency model								
Constant	-0.303	-0.412	-14.607*	-17.208	-14.987*	-9.210	3.765	0.902
Move from another place within this locality or another area of this country or another country. Category of reference: Don't move.								
Women' mobility	-0.105	-0.178	5.794*	7.456	2.508	1.475	-0.223	-1.059
Men' mobility	0.190	0.449	-6.475*	-8.053	-7.724*	-4.801	-0.373*	-2.471
Variance parameters for compound error								
Lambda	3.308*	2.084	6.304*	7.266	6.766*	4.020	1.764	18.556
Sigma(u)	0.484*	2.907	1.405*	18.777	1.550*	11.274	0.280	25.073
Average Inefficiency	0.15		0.19		0.38		0.12	
Null hypothesis, H_0: Testing for the absence of inefficiency effects. H_0: $\delta_1 = \delta_2 = 0$;								
LR test (Critical value at 1% : 9.21)	93.210		597.410		987.89		2005.0	

(*) Significant at 1%; (**) Significant at 5%.

[i] The European Community Household panel Survey data has been obtained from EUROSTAT (ECHP contract nº ECHP/2004/17)

[ii] See ALTONJI and BLANK, 1999, for a survey

[iii] The Limdep statistical package is used to estimate the stochastic frontier and the inefficiency determinants, GREENE, 2002.

[iv] In a two-stage procedure, firstly, a stochastic frontier function is estimated and the inefficiency scores are obtained on the assumption of independently and identically distributed inefficiency effects. However, in the second step inefficiency effects are assumed to be a function of some firm-specific variables, which contradicts the assumption of identically distributed inefficiency effects.

[v] Individual efficiency scores $u_{i,}$ which are unobservable, can be predicted either by the mean or the mode of the conditional distribution of u_i given the value of $(v_i\text{-}u_i)$ using the technique suggested by JONDROW et al., 1982.

[vi] LR=-2{ln[$L(H_0)$]-ln[$L(H_1)$]}, where $L(H_0)$ and $L(H_1)$ are the values of the likelihood function under the null and alternative hypotheses. LR has an approximately chi-square distribution with degrees of freedom equal to the number of restrictions