



IZA DP No. 6028

Overeducation and Local Labour Markets in Spain

Raul Ramos
Esteban Sanromá

October 2011

Overeducation and Local Labour Markets in Spain

Raul Ramos

*AQR-IREA, Universitat de Barcelona
and IZA*

Esteban Sanromá

IEB, Universitat de Barcelona

Discussion Paper No. 6028
October 2011

IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

Any opinions expressed here are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but the institute itself takes no institutional policy positions.

The Institute for the Study of Labor (IZA) in Bonn is a local and virtual international research center and a place of communication between science, politics and business. IZA is an independent nonprofit organization supported by Deutsche Post Foundation. The center is associated with the University of Bonn and offers a stimulating research environment through its international network, workshops and conferences, data service, project support, research visits and doctoral program. IZA engages in (i) original and internationally competitive research in all fields of labor economics, (ii) development of policy concepts, and (iii) dissemination of research results and concepts to the interested public.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ABSTRACT

Overeducation and Local Labour Markets in Spain^{*}

The objective of this paper is to analyze the influence of individual variables and some characteristics related to spatial mobility in regional labour markets on overeducation in Spain. With this aim, we use microdata from the Spanish Budget Family Survey to estimate a logit model for overeducation probability taking into account the problem of selection bias and the presence of data of different levels (individuals and territory). The obtained results permit us to conclude that the size of local labour markets and the possibility of extending the job search to other labour markets through commuting are relevant factors to explain overeducation in the Spanish labour market. In spite of the differences in terms of labour market institutions, our results are very similar to the ones obtained for other countries.

JEL Classification: J61, J24, J31

Keywords: educational mismatch, Spain, multilevel, commuting, job mismatch, differential overeducation

Corresponding author:

Raul Ramos
Universitat de Barcelona
Department of Econometrics, Statistics and Spanish Economy
Av. Diagonal 690
08034 Barcelona
Spain
E-mail: rramos@ub.edu

^{*} The authors would like to express their gratitude for the support received from AGAUR (Generalitat de Catalunya) through the project 2010ARF100044 and from the Spanish Ministry of Science and Innovation (VI Plan Nacional de Investigación Científica, Desarrollo e Innovación Tecnológica 2008-2011) through the actions ECO2010-16006 (Raul Ramos) and ECO2010-16934 (Esteban Sanromá).

OVEREDUCATION AND LOCAL LABOUR MARKETS IN SPAIN

1. INTRODUCTION AND OBJECTIVES

One aspect that has been scarcely considered in the literature on overeducation is its relationship with the territory. The link between both is related with the hypothesis of the differential overeducation. The idea is that overeducation will basically affect married women as their job search is restricted to the local labour market where they live, while the husband could search for a more adequate job according to his schooling in a wider labour market. Some studies, such as Büchel and Battu (2003), Büchel and Van Ham (2003), Hensen et al. (2009) and Quinn and Rubb (2011) have highlighted the role of regional labour market (mainly aspects related with commuting) as a potential explanatory variable of overeducation and not only of the differential overeducation of married women. In fact, Büchel and Van Ham (2003) and Hensen et al. (2009) have obtained empirical evidence in favour of the relevance for overeducation of regional variables related with the spatial distribution of employment and with the size of local labour markets. Their results show that the possibility of acceding to wider geographical areas when searching for job decreases the probability of being overeducated for men and women (and not only for married women).

The objective of this paper is to test the influence of individual variables and some characteristics related to spatial mobility of the labour force in regional labour markets on overeducation in the Spanish economy. With this aim, we use micro data from the *Encuesta de Presupuesto Familiares* 1990-91 (Family Budget Survey). Although the primary purpose of this survey is to analyse the consumer expenditure of the Spanish families, it also provides information about wages, individual and workplace characteristics. This dataset provides the greatest territorial detail when compared with more recent databases of similar content. In particular, data from this survey allows us to control the territorial dimension at a provincial level - the territorial administrative unit corresponding to the NUTS-III level of classification. This territorial unit is sufficiently small to allow us to assume that provinces approximate local labour markets. Our results do not support the hypothesis of the differential overeducation, but confirm that the size of the local labour market and the possibility of searching job in a wider area through commuting are important factors when explaining overeducation in the Spanish labour market.

The rest of the paper is structured as follows. First, in the next section, the literature on the topic is briefly summarised. In the third section, the database is described and a measure of overeducation is

calculated for the Spanish case. In the fourth section, the applied econometric methodology is explained and the empirical results are shown. Last, the paper concludes summarising the main results.

2. LITERATURE REVIEW

Taking as a starting point the seminal contributions by Freeman (1976) and by Duncan and Hoffman (1981), overeducation has been analysed in several countries¹. The Spanish case has not been different and since the study by Alba-Ramírez (1993), different authors have analysed the relevance of overeducation in the Spanish economy. However, an aspect that has not been considered in this literature is the relationship between overeducation and territory.

The hypothesis of differential overeducation was first introduced by Frank in 1978 for the United States. The objective of this study was to explain wage differences between men and women taking into account the role of overeducation. Frank (1978) assumes that individuals try to maximize their income when they search for jobs and minimize overeducation (the difference between their educational levels and the educational requirements of the job vacancy). This search process takes place in the global labour market for single individuals –as they can easily migrate- but not for couples. In this last case, a joint decision must be taken where the family member with a higher educational level and working a higher number of hours (the one with higher income is usually the husband in the context of Frank’s study) searches job in the global labour market minimizing his/her overeducation. However, the other family member (usually the wife) searches the best possible job taking into account the limitations of the local labour market where the family lives. Only by chance, the wife could also minimize her overeducation in the case of an optimum match. This spatial restriction would usually produce that the wife’s overeducation is higher than the husband’s one. Moreover, in this case, the wife’s overeducation will be related with the size of the local labour market, as the smaller it is, the lower will be the number of job vacancies that she could accede. Taking into account this hypothesis and according to Frank (1978), wage differences by gender would be related to overeducation, as it would affect predominantly to married women. The empirical evidence obtained by this author is in favour of this hypothesis: the smaller the local labour market, the higher wage differences by gender.

Two decades later and in a new context of generalisation of studies on overeducation, McGoldrick and Robst (1996) tested directly Frank’s hypothesis instead of estimating wage equations. Using data for the United States in 1985, they calculated overeducation measures using three different methods and, in the three cases, they found that married women had higher levels of overeducation than their husbands, but the size of the local labour market did not have any significant effect on this difference.

Opposite to Frank (1978), they did not find evidence in favour of the hypothesis of differential overeducation

García-Serrano and Malo (1997) test this hypothesis for the Spanish case using data from the *Encuesta de Estructura, Conciencia y Biografía de Clase* of 1991. Their results do not totally confirm the hypothesis of differential overeducation. They do not find a clear incidence of the gender on educational mismatch, although this variable is statistically significant when interacts with the age or with a variable picking up the fact of living together. So, they find that there are differences in Spain in terms of the educational mismatch, but this mismatch is not explained by the size of the local labour market. In fact, the size of the local labour market and being a women living with the couple negatively affect the probability of being infraeducated, but not the probability of being overeducated.

Büchel and Battu (2003) open a new research line extending Frank's model to consider the possibility of commuting. Using this new framework, they test the hypothesis of the differential overeducation using data for 1995 of the German economy to calculate a subjective measure of overeducation and considering the role of spatial mismatch. Their results seem to confirm the hypothesis as the probability of being overeducated is higher for married women living in rural areas (less than 20000 inhabitants). According to these authors, the probability that a woman finds a job in line with her educational level not only depends of the size of the local labour market (the original idea by Frank) but also of the possibilities of acceding other local labour markets through commuting. When the commuting distance is included in the model, the probability of being overeducated decreases for higher distances. Moreover, and more relevant, there is no evidence in favour of the hypothesis of differential overeducation. The results show that, once the commuting distance is controlled, the risk of being overeducated is higher for couples in rural areas for both members of the couple and not specifically for the woman.

Taking into account these previous results, Büchel and Van Ham (2003) develop a theoretical framework relating the existence of overeducation at the individual level (both for men and women) with the availability of job opportunities. Following Simpson (1992), they highlight that an individual searching for job in a particular local labour market has three options when in this market there is no appropriate job for him/her: The first option is not to accept the job and continue the search (unemployment); the second option consists in accepting a job in this local labour market but with lower educational requirements than the ones he/she has (overeducation); and, the third options consists in accepting a job in a different local labour market, probably assuming a commuting distance higher than desired. The central aspect of the analysis by Büchel and van Ham (2003) consists in analyzing which is the role of job opportunities in local labour markets (unemployment rates) and commuting (availability of private transport and commuting time) to explain the probability of being

overeducated. As in Frank (1978), geographical restrictions play a key role in explaining overeducation, but Büchel and Van Ham (2003) extend the effect to all workers (and not only women) and they consider the possibility of extending the job search to other local labour markets through commuting. Their results for the German labour market show that regional variables related with the spatial distribution of employments explain overeducation. Moreover, a higher mobility of individuals (owning a car or making longer commuting) permit to increase the “effective” size of the labour market, which decreases the probability of being overeducated. A similar result is found by Hensen et al. (2009), although they have not explicitly considered gender differences when analysing the relationship between geographic mobility and education-job mismatch in the Netherlands².

More recently, Quin and Rubb (2011) have used the Panel Study on Income Dynamics (PSID) for the United States, a longitudinal dataset that permits to control the timing of migration and its results in terms of the education-employment match. Their results suggest that migration often leads wives to exit fulltime paid employment in larger numbers than husbands. In fact, migration tends to lower the level of overeducation for men more robustly than for women, a result supporting the differential overeducation hypothesis. In fact, their analysis suggests that an overeducated wife may be more willing to migrate to improve her husband’s career and/or to exit the labour force rather than remain overeducated.

Taking these contributions into account, the objective of the paper is to identify the explanatory factors of being overeducated and, in particular, to analyse the effect of some of them that are related with the territory. In a first stage, the hypothesis of differential overeducation by Frank (1978) will be tested, and next, the effects of different territorial variables, such as the local labour market size or the possibilities of commuting, would be considered. For the Spanish case, the empirical literature about commuting decisions would be, a priori, in favour of the hypothesis of differential overeducation. Artís et al. (2000) estimate a multinomial logit model to analyse commuting using data for Catalonia for 1991. Their results show that the probability of commuting is clearly lower for wives, especially those that are also mothers. Romaní et al. (2001) analyse the interactions between the location of housing and the location of the working place, confirming the previous results regarding the marital status and the motherhood. Casado (2000) obtains similar results using data for the *Comunidad Valenciana* for 1991. It is worth mentioning that according to this author, the probability of commuting reduces when the number of sons increases. These results are in line with the asymmetric domestic work sharing found in Spain in that moment. Moreover, it is possible to think that commuting distances would also be different, as there is evidence that the fact of being the main income provider in the household increases the probability of commuting and of commuting using private transport (car) (Matas, 1991 and Matas et al. 2009). This evidence regarding differential commuting makes even more interesting the analysis in the paper.

Before showing the results of the econometric analysis, in the next section the used database is described and the results of calculating a measure of overeducation for the Spanish economy using this database are shown.

3. OVEREDUCATION IN THE SPANISH LABOUR MARKET

3.1. The Spanish Family Budget Survey

The estimates presented here are based on individual data from the *Encuesta de Presupuestos Familiares* (Family Budget Survey) carried out by the INE (the Spanish Institute of Statistics) for the second quarter of 1990 to the first quarter of 1991. Although the main objective of these surveys is the analysis of Spanish family consumption expenses, it also provides individual information of a great interest for labour microeconomics. In particular, this survey provides information on individual and family characteristics, their relation with the labour market and the characteristics of their living place with a higher level of territorial detail (*provincia*, NUTS-III) than other similar databases. In this paper, we have used information for individuals with ages between 16 and 65 years old and we have not considered individuals living in Ceuta and Melilla and those working in the army or not classified occupations. This sample has been splitted in two subsamples. The first one is formed by the 21.359 employed individuals living in Spain and not carrying formal studies and it has been used to calculate the incidence of overeducation in the Spanish labour market. The second subsample is formed by 5.492 individuals that finished, at least, secondary school (FP2, COU or university degrees) and did not continue studying. 4.889 of these individuals were employed while the other 603 were unemployed. This is the sample used for the econometric analysis of the following section.

3.2. The measurement of the educational mismatch

Taking into account that the *Encuesta de Presupuestos Familiares* does not contain subjective information about overeducation but it provides detailed information of the schooling levels and the occupation, we have used the statistical method³ to obtain our overeducation measure. The EPF disaggregates 14 different schooling level and ten of them can be applied to individuals older than 16. It also provides detailed information on 81 occupations, a 2-digit disaggregation that is lower than the optimum (3-digits of occupational classifications). For this reason, it is not possible to apply the corrected mode criterion as the number of categories where the mode will not be, at least, the 60% of total individuals is quite high. For this reason, we have used the average criterion.

The results of applying this procedure to 21.359 employed individuals that were not carrying formal studies during 1990-1991 show that the 14.6% of them were overeducated. The comparison with the results of previous studies available for that period (table 1) permits to observe that when the objective method is applied to the Spanish Labour Force Survey (EPA) the results are clearly lower, while the subjective method applied to the *Encuesta de Estructura, Conciencia y Biografía de Clase* (EECBC) provides a higher value. The results of the statistical procedure will be in the middle. The studies applying this method –with the average criterion- to databases referring to 1991 find a similar percentage to the one found here: a 15.9% for the EECBC and an 8.9% for the EPA. The criterion of the corrected method by Oliver and Raymond (2002) also provides a similar value to the one found here. So, in spite of the limitations of the applied procedure, the results found when using data from the *Encuesta de Presupuestos Familiares* are in line with the ones found by previous studies for the Spanish economy in the same period.

An empirical regularity in the literature of overeducation is that the probability of being overeducated is higher for more educated workers. We have calculated the relevance of overeducation in the sample of 4.889 employed individuals with, at least, secondary education⁴. The incidence of overeducation is four points higher than the global one: 18.7% and 14.6%, respectively. By gender, the result also changes, as now overeducation is slightly more relevant in women (19.1%) than in men (18.5%). Taking into account that unemployment is higher among women, one could think that a higher unemployment rate could push women to accept jobs with lower educational requirement than the one they have. Both phenomena (employment opportunities and overeducation) could be clearly interrelated, aspect that is further developed in the next section.

Table 1. *Percentage of overeducated workers in Spain at the beginning of the nineties according to different studies*

Authors	Survey	Year	Method	Overeducated (%)
Alba-Ramírez (1993)	Encuesta de Condiciones de Vida y de Trabajo	1985	Subjective (indirect)	17.00%
García Montalvo (1995)	Encuesta de Población Activa (LFS)	1985	Objective	3.70%
García Montalvo (1995)	Encuesta de Población Activa (LFS)	1989	Objective	6.30%
Oliver and Raymond (dirs.) (2002)	Encuesta de Población Activa (LFS)	1990	Statistic (mode)	17.20%
García Serrano and Malo (1996)	Encuesta de Conciencia y Biografía de Clase	1991	Subjective (indirect)	28.40%
García Serrano and Malo (1996)	Encuesta de Conciencia y Biografía de Clase	1991	Subjective (direct)	29.40%
García Montalvo (1995)	Encuesta de Población Activa (LFS)	1991	Statistic (average)	8.90%
Beneito et al. (1996)	Encuesta de Conciencia y Biografía de Clase	1991	Statistic (average)	15.90%
García Montalvo (1995)	Encuesta de Población Activa (LFS)	1993	Objective	7.70%
Own estimates	Encuesta de Presupuestos Familiares (FBS)	1990-91	Statistic (average)	14.60%

Source: Blanco (1997) and own elaboration

4. OVEREDUCATION, LOCAL LABOUR MARKETS AND COMMUTING

4.1. Methodology

The objective of the paper is to identify the explanatory factors of being overeducated, and, in particular, to analyse the possible effects of some variables related to the territory. In particular, we want to explain the behaviour of a dichotomous value taking value 1 when the individual is overeducated and value 0 on the contrary. In this context, the multiple lineal regression models are not appropriate. It is much more interesting to answer questions such as: Which is the probability of being overeducated taking into account the characteristics of the individual, of his/her job or the territory where he/she lives?. This kind of questions can be easily answered using logit models that permit to estimate (using maximum likelihood techniques) the increase in probability of being overeducated after marginal variations of the explanatory variables.

However, one additional aspect that should be considered is the presence of the explanatory variables related to individual characteristics and other related to regional characteristics. If the presence of data of different levels is not considered, the inference from the model could be seriously affected. In this context, the usual solution consists in the specification and estimation of multilevel models (Goldstein, 1995; Hox, 1998 or Goldstein and Rasbash, 1996). The results in the next section rely on the specification and estimation of this kind of models.⁵

An additional aspect that should be mentioned before starting the empirical analysis is that it is impossible to know for an unemployed worker if he/she is overeducated or not as they cannot be assigned to any particular occupation. However, it is possible that an unemployed worker prefers to extend his/her job search when he/she is offered a job with lower educational requirements than his/hers. If this possibility is not considered in the empirical analysis, the results could be incorrect. This problem is known in the literature as “selection bias”. To solve this problem, we have applied the two steps procedure by Heckman (1979). The first step of the procedure consists in analyzing the probability of being employed, while the second consists in the analysis of the probability of being overeducated including an additional explanatory variable known as Heckman’s lambda (obtained in the first step as the inverse of the Mills’ ratio⁶). Taking into account the binary nature of both variables, logit models would be used in the two steps.

4.2 Results

In this section, the results of estimating different models to identify the determinants of being employed and being overeducated in the Spanish labour market are presented. The results of testing the hypothesis of differential overeducation and the influence of variables related to the territory on overeducation for the Spanish economy are shown in tables 2 and 3.

The results of estimating a logit model explaining the probability of being employed or not (the first stage of the Heckman procedure) are shown in the first column of each table. The results of estimating a logit model for overeducation without taking into account the problem of selection bias are shown in the second column. These results are shown to analyse the effects of introducing the Heckman's lambda in the model. In this sense, the third column of each table belongs to the estimation of the second stage of the Heckman's procedure.

Regarding the test of the differential overeducation for the Spanish case, the results are shown in table 2. With the aim of testing this hypothesis, we have included in each of the three previously mentioned models, variables related to individual characteristics but also related with the local labour market, the size of the town where the individual lives or the unemployment rate⁷.

The educational level and the experience have positive and significant effects on the probability of being employed, while the fact of being woman and living in couple, or being son and living with parents reduce that probability. Local labour market conditions are also relevant, as the provincial unemployment rate is negative and statistically significant. From the results of estimating this model, we have calculated the values of Heckman's lambda for each individual that will be used as an explanatory variable in the following models in order to control for selection bias.

The results of estimating explanatory models for overeducation are shown in the second and third columns of table 2. The results in both columns only differ in terms of the inclusion/not inclusion of Heckman's lambda, which is not statistically significant. Two of these results deserve a brief comment. On one hand, the probability of being overeducated increases with the educational level. This is a usual result in the international literature, but also for the Spanish economy. On the other hand, potential experience does not affect the probability of being overeducated. Although perhaps this is not a rigorous test, this result does not confirm the substitutability between education and other forms of human capital postulated by the human capital theory⁸.

In order to test the hypothesis of differential overeducation, we have introduced as explanatory variables interactions between the gender, the marital status and the size of the residence town taking as base category the married women living in small towns. The hypothesis of differential overeducation would not be rejected if the rest of categories showed a lower probability of overeducation. Although most signs are negative, the only negative and significant variables are the ones regarding married men living in big towns and single women living in big towns⁹, with no significant differences among the other categories. These results permit to reject the hypothesis by Frank (1978), a similar result to the ones by McGoldrick and Robst (1996) and by García Serrano and Malo (1997) and by Büchel and Battu (2003) after introducing the possibility of commuting.

Table 2. *Determinants of employment and overeducation (first and second stage of the Heckman procedure)*

Explanatory variables	Dependent variable: employed			Dependent variable: overeducated			Dependent variable: overeducated		
	Coefficient	Standard error		Coefficient	Standard error		Coefficient	Standard error	
Intercept	-0.072	0.263		-25.573	1.212	***	-25.817	1.243	***
Woman (man)	-0.293	0.082	***						
Woman * rest family income	0.021	0.023							
Woman with children (woman without children)	-0.017	0.119							
Married (single)	0.344	0.108	***						
Married Woman (single woman)	-0.315	0.132	***						
Married woman living in a big town				-0.148	0.270		-0.134	0.272	
Single woman living in a big town				-0.495	0.288	*	-0.499	0.289	*
Single woman living in a small town				0.012	0.169		-0.014	0.172	
Married man living in a big town				-0.529	0.208	***	-0.460	0.225	**
Single man living in a big town				-0.152	0.118		-0.077	0.146	
Married man living in a small town				-0.306	0.272		-0.241	0.285	
Single man living in a small town				-0.046	0.169		0.000	0.177	
Son living with their parents (not living)	-0.350	0.087	**	0.161	0.151		0.057	0.192	
Experience	0.061	0.010	***	-0.016	0.016		-0.003	0.022	
Experience ²	-0.001	0.000	***	0.000	0.000		0.000	0.000	
Schooling years	0.053	0.014	***	1.448	0.040	*	1.458	0.042	***
Part-time work (full-time work)				-0.287	0.324		-0.299	0.326	
Provincial unemployment rate	-0.021	0.006	***	-0.005	0.010		-0.009	0.011	
Lambda							0.872	0.990	

*** 1%, ** 5%, *10%

Table 3. *Determinants of employment and overeducation (first and second stage of the Heckman procedure)*

Explanatory variables	Dependent variable: employed			Dependent variable: overeducated			Dependent variable: overeducated		
	Coefficient	Standard error		Coefficient	Standard error		Coefficient	Standard error	
Intercept	0.277	0.504	***	-24.294	0.788	*	-25.004	0.887	
Woman (man)	-0.438	0.143		0.074	0.117		-0.085	0.147	
Woman* rest family income	0.011	0.040							
Woman with children (Woman without children)	0.052	0.223		-0.157	0.185		-0.166	0.186	
Married (single)	1.271	0.186	***						
Married Woman (single man)	-0.845	0.260	***	0.176	0.180		0.281	0.190	
Experience	0.123	0.018	***	-0.026	0.015	*	0.003	0.022	
Experience ²	-0.002	0.001	***	0.000	0.000		0.000	0.000	
Schooling years	0.102	0.025	***	1.453	0.041	***	1.473	0.042	***
Part-time work (full time work)				-0.353	0.324		-0.368	0.327	
Availability of private transport (not availability)				-0.728	0.155	***	-0.722	0.155	***
Living in a small town (living in a big town)				0.409	0.156	***	0.397	0.159	***
Provincial unemployment rate	-0.041	0.013	***	-0.013	0.010		-0.018	0.011	
Km roads/cars	-0.031	0.380		-0.558	0.303	**	-0.533	0.311	*
Lambda							1.222	0.680	*

*** 1%, ** 5%, *10%

However, the results suggest that overeducation could be more related with the size of the local labour market (town) than with the gender or the marital status. This is just the hypothesis by Büchel and van Ham (2003). Following these authors, we have analyzed the effect on the probability of being overeducated of the size of the local labour market and the possibilities of acceding to a higher area to search for jobs. In particular, we have proxied the local labour market size by including in the model the number of inhabitants in the town of residence of the individual. The available information in the EPF has been summarised in two categories: town of more of 50.000 inhabitants or province capital and the rest of towns. The possibility of widening the spatial job search in order to achieve a better match that would avoid overeducation has been considered through the inclusion in the model of two variables: one at the individual level, the availability of private transport, and other provincial, the number of road kilometres respect to the number of cars¹⁰.

The results of the first stage of the Heckman procedure (first column of table 3) are similar to the previous ones. The results regarding overeducation (columns 2 and 3) confirm that the probability of being overeducated is higher for more educated workers.

Heckman's lambda is statistically significant at a 10% level, which can be interpreted as favourable evidence in the Spanish labour market of the previously mentioned strategy consisting in not accepting an "overeducated" job but waiting for an optimum one. This strategy is consistent with the fact that in Spain there is a very important family protection network against unemployment and a quite generous unemployment benefit system (in 1990-91 and in relative terms with other developed countries - OCDE, 1994). However, if unemployment is high and long-lasting, there will be limits to the validity of the strategy, and to the significance of lambda.

Again, experience is not significant reinforcing the previously found evidence contrary to the substitutability between human capital components. It is worth mentioning that the gender does not seem to have any effect on overeducation. Although overeducation measures can be different between men and women, once other characteristics are controlled, there are no significant differences¹¹.

In the case of territorial variables, the most relevant for this study, they clearly affect overeducation with the expected signs. On one hand, the fact of living in a small town and as a result having less job opportunities, increases the probability of being overeducated. It is especially interesting the fact that the possibility of searching job in a wider area, reduces significantly the probability of overeducation. In fact, the availability of private transport¹² and the level of infrastructure of the considered region (proxies by the number of road kilometres by vehicle) are statistically significant and with the expected negative sign¹³. So, the probability of being overeducated is partially explained by spatial factors, such as the size of the local labour market or the possibility of "increasing" its size through searching job in more distant labour markets thanks to the availability of private transport and a good road network.

These results are in line with the ones obtained for the German labour market by Büchel and Van Ham (2003) and for the United States by Quin and Rubb (2011) and reinforce the idea that the spatial dimension of the problem is more relevant than the differential overeducation of women. Moreover, the obtained results can be understood as possible differences in terms of overeducation between men and women could be determined by the difficulties of women to commute due to their higher responsibilities in home duties, especially when they have short-age children.

5. CONCLUSIONS

The objective of this paper has been to test the influence of local labour markets and other variables related with the territory and spatial mobility on overeducation in the Spanish economy.

With this aim, we have used microdata from the *Encuesta de Presupuestos Familiares 1990-91* and applied the most adequate econometric techniques (multilevel logit models with selection bias correction). The obtained results have confirmed that the probability of being overeducated increases with the schooling level, but this probability is not related to the potential experience of the individual. This result permits to reject the existence of substitubility between the different human capital components. A second result to highlight is that in the Spanish labour market, workers could have preferred not to accept a job where they would be overeducated and continue searching for an optimum job. In the particular case of variables related to territory, the hypothesis of differential overeducation of Frank (1978) has been rejected, as the risk of overeducation is not higher for married women living in small towns. This result is in line with the available evidence for other countries. But, the most relevant result of this study is that overeducation can be partly explained by spatial factors, such as the size of the town where individuals live or the possibility of acceding to a bigger labour market due to the availability of private transport making commuting much easier or the existence of adequate transport infrastructures (road). If this is true, individuals that are more affected by overeducation are not married women, but individuals living in small towns and geographically limited in their process of searching job as a result of their low commuting.

In spite of the striking differences in terms of labour market institutions, the results for Spain are in line with the ones obtained for the German labour market by Büchel and Van Ham (2003) and for the United States by Quinn and Rubb (2011), who highlight the relevance of the spatial dimension of overeducation as opposite to the differential overeducation of married women. In fact, possible differences in terms of overeducation between men and women could perhaps be explained by the lower spatial mobility of women.

6. REFERENCES

- ALBA-RAMÍREZ, A. (1993), Mismatch in The Spanish Labor Market: Overeducation?. *The Journal of Human Resources* 28, pp. 259-278.
- ARTÍS, M., J. ROMANÍ. & J. SURIÑACH (2000), Determinants of Individual Commuting in Catalonia (1986-91): Theory and Empirical Evidence. *Urban Studies* 37 (8), pp. 1431-1450.
- BARONE, C. & L. ORTIZ (2011), Overeducation among European University Graduates: A comparative analysis of its incidence and the importance of higher education differentiation. *Higher Education* 61 (3), pp. 325-337.
- BLANCO, J. M. (1997), Comentarios Acerca del Desajuste Educativo en España, *Papeles de Economía Española* 72, pp. 117-128.
- BENEITO, P., J. FERRI, M. L. MOLTÓ & E. URIEL (1996), Desajuste Educativo y Formación Laboral Especializada: Efectos sobre los Rendimientos Salariales, *Documento de Trabajo IVIE*, WP-EC 96-11.
- BJORNER, T. B. & S. LETH-PETERSEN (2005), Dynamic Models of Car Ownership at the Household Level, *International Journal of Transport Economics* 32 (1), pp. 57-75.
- BÜCHEL, F. & H. BATTU (2003), The Theory of Differential Overqualification: Does It Work?. *Scottish Journal of Political Economy* 50 (1), pp. 1-16.
- BÜCHEL, F. & M. VAN HAM. (2003), Overeducation, Regional Labour Markets and Spatial Flexibility. *Journal of Urban Economics* 53 (3), pp. 482-493.
- CASADO, J.M. (2000), Diferencias de Género en los Desplazamientos Cotidianos por Razones Laborales. *Documento de Trabajo IVIE* WP-EC-2000-03.
- DUNCAN, G. AND HOFFMAN, S. (1981), The Economic Value of Surplus Education. *Economics of Education Review* 1 (1), pp. 75-86.
- FRANK, R. (1978), Why Women Earn Less: The Theory and Estimation of Differential Overqualification. *American Economic Review* 68 (3), pp. 360-373.
- FREEMAN, R. B. (1976), *The Overeducated American*. London: Academic Press.

GARCÍA MONTALVO, J. (1995), Empleo y Sobrecualificación: El Caso Español. *Documento de Trabajo FEDEA* 95-20.

GARCÍA SERRANO, C. & M. A. MALO (1996), Desajuste Educativo y Movilidad Laboral en España. *Revista de Economía Aplicada* 4 (11), pp. 105-131.

GARCÍA SERRANO, C. & M. A. MALO (1997), ¿Es Diferente el Desajuste Educativo de las Mujeres?. *Información Comercial Española. Revista de Economía* 760, pp. 117-128.

GOLDSTEIN, H. (1995), *Multilevel Statistical Models*. London: Edward Arnold.

GOLDSTEIN, H. & J. RASBASH (1996), Improved Approximations for Multilevel Models With Binary Responses. *Journal of the Royal Statistical Society A* 159, pp. 505-514.

HARTOG, J. (2000), Over-Education and Earnings: Where are We, Where Should We Go, *Economics of Education Review* 19, pp. 131-147.

HECKMAN, J. (1979), Sample Selection Bias as a Specification Error. *Econometrica* 47, pp. 153-161.

HENSEN, M.M., M. R. DE VRIES, F. CÖRVERS (2009), The role of geographic mobility in reducing education-job mismatches in the Netherlands, *Papers in Regional Science* 88 (3), pp. 667-682.

HOX, J. (1998), Multilevel Modeling: When and Why?. in Balderjahn, I., R. Mathar & M. Schader: *Classification, Data Analysis and Data Highways* New York: Springer-Verlag, pp. 147-154.

KIKER, B., M. SANTOS & M. MENDES DE OLIVEIRA (1997), Overeducation and Undereducation: Evidence for Portugal. *Economics of Education Review* 16 (2), pp. 111-125.

MATAS, A. (1991), La Demanda de Transporte Urbano: Un Análisis de las Elasticidades y Valoraciones del Tiempo. *Investigaciones Económicas* XV (2), pp. 249-267.

MATAS, A., J. L. RAYMOND & J. L. ROIG (2009), Car ownership and access to jobs in Spain, *Transportation Research Part A: Policy and Practice* 43 (6), pp. 607-617.

MCGOLDRICK, K. & J. ROBST (1996), Gender Differences in Overeducation: A Test of the Theory of Differential Overeducation. *American Economic Review* 86, pp. 280-285.

MCGUINNESS, S. (2006), Overeducation in the labour market, *Journal of Economic Surveys* 20 (3), pp. 387-418.

MENDES DE OLIVEIRA, M. M. SANTOS & B. KIKER (2000), The Role of Human Capital and Technological Change in Overeducation. *Economics of Education Review* 19, pp. 199-206.

OLIVER, J. & J. L. RAYMOND (dirs.) (2002), Educación Formal y Demanda de Cualificación de la Mano de Obra en España. Una Visión a Largo Plazo, *Centre d'Economia Industrial Document d'Economia Industrial* N. 14.

QUINN, M.A. & S. RUBB (2011), Spouse Overeducation and Family Migration: Evidence from the US. *Journal of Family and Economic Issues* 32 (1), pp. 36-45.

ROMANÍ, J., M. ARTIS & J. SURIÑACH (2003), Are Commuting and Residential Mobility Decisions Simultaneous? The Case of Catalonia (Spain). *Regional Studies* 37 (8), pp. 813-826.

RUBB, S. (2003). Overeducation in the labor market: A comment and re-analysis of a meta-analysis. *Economics of Education Review* 22 (6), pp. 621-629.

SICHERMAN, N. (1991), Overeducation in the Labour Market. *Journal of Labour Economics* 9, pp. 101-122.

SIMPSON, W. (1992), *Urban Structure and the Labour Market: Worker Mobility, Commuting and Underemployment in Cities*. Oxford: Clarendon Press.

VENHORST, V., J. VAN DIJK & L. VAN WISSEN (2010), Do the best graduates leave the peripheral areas of the Netherlands?, *Tijdschrift voor Economische en Sociale Geografie* 101 (5), pp. 521-537.

VERDUGO, R. & N. VERDUGO (1989), The Impact of Surplus Schooling on Earnings. *Journal of Human Resources* 24 (4), pp. 629-643.

7. FINAL NOTES

1. The surveys by Hartog (2000), Groot and Maassen van den Brink (2000a), Rubb (2003) and McGuinness (2006) have summarised the main finding of this literature.
2. Venhorst et al. (2010) also analyzed the relationship between ability, field of study and spatial mobility using a micro-dataset on Dutch university and collage graduates. Their findings indicate that university graduates are more spatially mobile than vocational college level graduates in order to minimize their job mismatch.
3. Hartog (2000) provides an excellent survey of the different methods (objective, subjective and statistical) to calculate educational mismatch and their main advantages and weaknesses. Verdugo and Verdugo (1989) and Kiker et al. (1997) defend the use of the statistical method: the first using the average while the second using the mode. Mendes de Oliveira et al. (2000) also recommend this method but using a “corrected mode”.
4. Barone and Ortiz (2011), who focuses their analysis only on European graduates, adopt a similar approach.
5. The calculations in the paper have been obtained using PROC GLIMMIX that makes possible to estimate multilevel models with SAS 9.1. This procedure can be downloaded as an add-on from the SAS website <http://support.sas.com/rnd/app/da/glimmix.html>.
6. This variable picks up the effects of all those unobservable characteristics related with the decision of employment-overeducation. The introduction of this variable in the second equation corrects for the possible problems related with the omission of relevant variables in the estimation of the coefficients of the rest of explanatory variables.
7. The source for the provincial unemployment rate is the Encuesta de Población Activa (Labour Force Survey).
8. Sicherman (1991) for the United States, Mendes de Oliveira et al. (2000) for Portugal and García Serrano and Malo (1996) and Beneito et al. (1996) for Spain are examples of more detailed test of the human capital hypothesis.
9. Always in relation with married women living in small towns.
10. The source of the number of cars and kilometres of road in each province is the *Anuario Estadístico del INE*.
11. This result is in line with the one obtained in the meta-analysis by Groot and van den Brink (2000a).
12. A similar result to the one found by Matas et al. (2009) for the Spanish labour market.
13. In order to take into account the possible endogeneity of the variable related to the availability of private transport, we have set up a simultaneous equation model formed by the two considered equations and an additional one explaining car ownership at the household level following Bjorner and Leth-Petersen (2005). The results, which are available from the authors on request, were very similar to the ones presented here.