

## On the links between spatial variables and overeducation

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This article considers the role that diverse spatial variables play in explaining overeducation. Unlike previous analyses of the Spanish case, we have directly tested the links between current mobility (commuting and migration) and overeducation, and in contrast to previous literature, we have included a direct measure of potential spatial flexibility at an individual level (worker availability to migrate, in response to the needs of his/her firm). Regional labour market conditions are also considered in the analysis. Our results show that the links between overeducation and spatial variables vary depending on the specific sub-group of wage earners considered, based on gender and education.

## I. Introduction

A good match between individual education and that required in the labour market is essential to ensuring that the best use is made of investment in human capital and to stimulate strong and inclusive growth. However, approximately 20% of workers are overeducated in OECD countries, with Spain being one of the European countries having a higher incidence of this phenomenon (Quintini 2011). Over recent years, a number of articles have focused on the importance of spatial variables in improving our understanding of overeducation, arguing that this phenomenon might partially reflect the difficulties in the match between demand and supply of skills due to restricted geographical job searches and poor regional labour market conditions in terms of job concentrations or regional unemployment levels, among other factors.

Frank (1978) is considered a pioneer in this area of research. He proposed the so-called *theory of differential overqualification*: married women living in smaller labour markets have a higher risk of suffering from overqualification. While McGoldrick and Robst (1996) did not find evidence to support this theory, Büchel and Battu (2003), who went on to consider the moderating effect of commuting on overeducation, obtained mixed evidence to support it. Büchel and van Ham (2003) find that the risk of overeducation is higher for those living further from large employment concentrations and for those who are less flexible (do not have access to a car). In contrast, local unemployment is not significant. Hensen et al. (2009) measure spatial flexibility as the Euclidean distance between the municipality of education and the location of the current job and find that for the overall population under scrutiny (vocational education graduates) >70 km is the only category that significantly reduces overeducation. Moreover, higher levels of unemployment and job density improve the education-job match. Jauhainen (2011) finds that living in large regional labour markets reduces overeducation while regional unemployment has a negative albeit not significant effect. Furthermore, migration between regions has a negative effect and having a car is not significant. Quinn and Rubb (2011) show that recent migration does not impact female overeducation but it does improve the education-

job match for male workers. Huber (2012) analyzes internal and cross-border commuting and finds that while the former contributes to better education-job matches, the effect of the latter varies depending upon the European countries considered. Ramos and Sanromá (2013) explore the Spanish case and conclude that the differential overeducation hypothesis is not confirmed. Moreover, they find that the availability of private transport reduces the risk of overeducation, the regional unemployment rate is negatively linked to overeducation only for the 2006 sample and the density of roads has a statistically significant negative effect on overeducation in 1990-91 and a positive effect in 2006. Finally, two recent articles consider the Italian case. Devillanova (2013) concludes that commuting has a negative impact on the probability of being overeducated, but he does not find clear evidence that migration has a similar effect. In turn, Croce and Ghignoni (2015) find that commuting time reduces the risk of overeducation for upper secondary graduates but is not significant for their tertiary counterparts, with the opposite being true for the migration variable.

Overall, previous literature has considered two main groups of spatial variables: local labour market conditions and spatial flexibility. The latter of these includes variables of a rather different nature: current mobility (commuting and migration) and, mainly due to limitations in the available datasets, proxies for flexibility (e.g. having a car or distance to labour concentrations). It is noticeable that the results of these studies have not led to a consensus regarding the significance of the diverse spatial variables considered and, more notably, on the sign of the effect of such variables on the probability of being overeducated.

This paper considers the main variables that have already been identified in the literature as being relevant in explaining the influence of spatial factors on overeducation (including, for the first time in the Spanish case, a direct measure of commuting and migration), and incorporates a new form of potential flexibility (worker willingness to change his or her place of residence in response to the needs of the firm). Our hypothesis is that this form of potential spatial flexibility is valued by the firm and rewarded in terms of a better job-education match.

## II. Data and method

The dataset includes wage earners aged 16 and older, having a level of education higher than primary education. The source used is the Survey of Quality of Life at Work (ECVT), 2008-2010. In line with many of the precedent studies, overeducation is measured through a subjective method. We estimate several logit models where the dependent variable takes on a value of 0 if the individual is appropriately educated for his/her job; 1 if they are overeducated. Separate estimations are used for men and women, as is common practice. Moreover, in accordance with the reasoning of Hensen et al. (2009) and Croce and Ghignoni (2015), the original sample has been further segmented to present separate estimations for university graduates.

Section I reveals that in analyzing the links between overeducation and spatial factors, the relevance of two sets of variables is noteworthy: one refers to local labour market characteristics, and one measures spatial flexibility. We have followed this structure in selecting the variables of interest for our study. Therefore, we consider unemployment rate (regional) and job density (proxied as the number of occupied workers per square kilometer, regional). Mobility variables are directly measured through the inclusion of commuting (in minutes), commuting squared (to account for possible nonlinear effects), and migration<sup>1</sup> (a dichotomous variable that has a value of 1 when the individual has moved). Moreover, and in contrast with previous studies, we introduce a new variable to measure potential mobility. This variable is

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<sup>1</sup> We have considered the possibility of the migration variable being endogenous, but the Hausman endogeneity test does not reject the null hypothesis (exogeneity of the migration variable) with a p-value of 0.42. We have also re-estimated the model excluding that variable. The changes in the coefficients of the rest of the explanatory variables are insignificant, so we can rule out the possibility of endogeneity for the migration variable.

based on the worker's response to a question asking whether he or she would be willing to change his/her place of residence in response to firm's needs. Spatial flexibility variables are expected to exert a moderating effect on over-education since they are associated with expanded labour areas and therefore, with potentially better job-education matches. Finally, we have also included a dummy variable that identifies individuals living in a couple in small towns (municipalities with less than 10,000 inhabitants).

In addition to the variables of interest, the usual covariates covering a number of the workers' personal, job and firm characteristics are also included in the models. These are age (and its square), marital status (living or not in a couple), nationality (foreigner/native), education (lower secondary and lower vocational/upper secondary and upper vocational/tertiary), having (or not) children aged 13 and less, type of contract (permanent/temporary, part-time/full-time), type of employer (private/public), activity sector (agriculture, manufacturing, construction and services) and firm size (<10, 10-49, 50-249, 250+). Finally, controls for the survey year are also considered in all models.

### **III. Results**

Table 1 presents the results for the variables of interest, those with a spatial dimension. Starting with the variables that explore the influence of local labour market conditions on the probability of suffering from overeducation, and in line with our expectations (higher levels of unemployment make good education-job matches more difficult), the regional unemployment level has a positive impact on overeducation, although the effect is only significant for female workers with lower or upper secondary education (since for female university graduates the variable is only significant at 11% level). This result nuances those from previous studies where the variable was not found to be significant (Büchel and Battu 2003; Jauhainen 2011; Croce and Chignoni 2015) or had a counterintuitive sign (Hensen et al. 2009; Ramos and Sanromá 2013). Job density is not significant in any of the models considered, a result which agrees with the works of Croce and Chignoni (2015), but is at odds with Hensen et al. (2009).

Secondly, married women living in a small municipality have a higher probability of being over-educated, a result which supports the theory of differential over-education (Frank, 1978). It is noticeable however that this result does not hold for female university graduates, a group for which this variable is not significant.

Thirdly, the results do not generally support the hypothesis that current mobility, measured as commuting or migration, contributes to a reduction in over-education, since in only one of the estimated models (model III, male university graduates) one of these variables, migration, is found to exert a significant (at 10% level) and exerts a negative effect on the probability of being over-educated. This result is in line with the findings of Quin and Rubb (2011), who suggest that having moved does not reduce over-education among female workers but it does for their male counterparts, especially for those with higher incomes (who are likely to have higher levels of education).

Finally, the individual's willingness to change residence due to the needs of the firm seems to be rewarded through a reduction in the probability of being over-educated, although only for male workers (including university graduates).

### **IV. Conclusion**

Spatial variables cannot be neglected when analyzing overeducation. According to our results individual potential spatial flexibility, measured here as the worker's availability to change his/her place of residence, is negatively linked with over-education, but only for male workers. Furthermore the variables measuring current observed mobility (commuting and migration) are not statistically significant as a whole, with the sole exception of male workers with a university degree, for which migration results in a better education-job match. Finally, territorial variables

yield mixed results (job density is not significant and lower levels of regional unemployment rate reduce over-education only in female workers).

Overall, our results offer evidence that the potential positive effects associated with spatial flexibility may apply only to male workers while some of the negative effects potentially associated with poorer labour market conditions may only affect female workers, with education playing a moderating role. These findings underline the need for further research on this issue since they do not provide clear evidence in favor of what could be an a priori logical guide for policy making in the field (e.g. fostering individual mobility): these policies might not actually result in an improved job-education match for all groups of workers.

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## References

- Büchel, F. and Battu, H. (2003) The theory of differential overqualification: does it work?, *Scottish Journal of Political Economy*, **50**, 1-16.
- Büchel, F. and van Ham, M. (2003) Overeducation, regional labor markets, and spatial flexibility, *Journal of Urban Economics*, **53**, 482-493.
- Croce, G. and Ghignoni, E. (2015) Educational mismatch and spatial flexibility in Italian local labour markets, *Education Economics*, **23**, 25-46.
- Devillanova, C. (2013) Over-education and spatial flexibility: New evidence from Italian survey data, *Papers in Regional Science*, **92**, 445-465.
- Frank, R. (1978) Why Women Earn Less: The Theory and Estimation of Differential Over-qualification, *American Economic Review*, **68**, 360-373.
- Hensen, M.M., De Vries, M.R. and Cörvers, F. (2009) The role of geographic mobility in reducing education-job mismatches in the Netherlands, *Papers in Regional Science*, **88**, 667-682.
- Huber, P. (2012) Do commuters suffer from job-education mismatch?, *Applied Economic Letters*, **19**, 349-352.
- Jauhiainen, S. (2011) Overeducation in the Finnish regional labour markets, *Papers in Regional Science*, **90**, 573-589.
- McGoldrick, K and Robst, J. (1996) Differences in Overeducation: A Test of the Theory of Differential Overqualification, *American Economic Review*, **86**, 280-284.
- Quin, M.A. and Rubb, S. (2011) Spouse Overeducation and Family Migration: Evidence from the US, *Journal of Family and Economic Issues*, **32**, 36-45.
- Quintini, G. (2011) Right for the job: over-qualified or under-skilled? OECD Social, Employment and Migration Working Papers No. 120
- Ramos, R. and Sanromá, E. (2013) Overeducation and local labour markets in Spain, *Tijdschrift voor Economische en Sociale Geografie*, **104**, 278-291.

**Table 1. Logit models for overeducation (results for spatial variables)**

	I. Male		II. Female		III. University graduate - Male		IV. University graduate - Female	
	Coeff.	SE <sup>a</sup>	Coeff.	SE <sup>a</sup>	Coeff.	SE <sup>a</sup>	Coeff.	SE <sup>a</sup>
Unemployment rate	0.007	0.009	0.022***	0.006	0.018	0.016	0.042	0.026
Job density	0.002	0.001	0.002	0.001	-0.000	0.002	0.002	0.002
Living in couple in small municipality	-0.096	0.086	0.178**	0.092	-0.133	0.168	-0.069	0.113
Commuting	0.002	0.003	0.004	0.003	0.004	0.005	0.003	0.005
Commuting <sup>2</sup>	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.000
Migration	0.024	0.063	0.070	0.067	-0.173*	0.105	-0.073	0.089
Availability for changing place of residence	-0.266***	0.096	0.081	0.098	-0.361**	0.155	-0.068	0.142
N	8 442		7 242		2 378		2 876	
Log pseudolikelihood	-3920.3		-3855.0		-1265.1		-1264.1	
% overeducated	19.49		25.32		24.81		28.43	

Source: Survey of Quality of Life at Work (ECVT) (Spanish Ministry of Employment and Social Security), own calculations.

Notes: other variables related with personal, job and firm characteristics were included and not reported here (details provided in Section II).

<sup>a</sup> Cluster adjusted robust standard errors.

Levels of significance: \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$