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INFORMAL NETWORKS, SPATIAL MOBILITY AND OVEREDUCATION IN THE ITALIAN LABOUR MARKET

by

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Abstract

This paper investigates the impact of the use of the informal recruitment channel (relatives and friends) on the probability of being overeducated in the Italian labour market. We argue that the informal recruitment channel may increase job-education mis-matches both directly (by inducing some workers to undertake careers in industries, professions, or firms where their comparative productive advantage is not fully exploited) and indirectly by negatively affecting spatial flexibility. In order to test these hypotheses, we estimate probit models with self-selection using ISFOL PLUS survey data providing information on labour market entry channels, job related migration and a "subjective" measure of overeducation. We find a robust positive impact of the use of the informal channel on overeducation and a robust negative effect of the use of this channel on migration. On the other hand, we find that migration reduces overeducation only when focusing on private employment or on some geographical areas of the Italian territory. Overall, these findings suggest that a reform of employment services in Italy is needed in order to favour spatial flexibility, reduce the use of the informal channel and enhance the quality of job-education matches.

JEL Classification: R23, J24; J61

Key words: overeducation, informal recruitment channel, migration, spatial flexibility in labour market

1. Introduction

Imperfect information leads to various forms of mismatches in the labour market. One of such mismatches is the phenomenon of overeducation denoting a situation in which workers' schooling levels are not necessary for carrying out their jobs. Education-job mismatches have negative consequences for individuals and firms since they lead to lower income levels, higher dissatisfaction, lower productivity and higher turnover. Understanding the determinants of skills underutilisation is, therefore, important for enhancing human capital investment, bringing better competencies into the labour market and increasing living standards.

Italy is one of the industrialised countries with the lowest percentage of graduates[1]. Nevertheless, in 2011, 18.2% of graduates declared that their schooling level was not required for their job. Such percentage was 36.9% for people with a secondary degree. These figures show the presence of the paradoxical phenomenon called "overeducation" in a country that relatively under-invests in high education. The Italian labour market is also characterised by strong differences in the distribution and in the quality of jobs over the territory. In 2011, the unemployment rate was 5.8 in the North, 7.6 in the Centre and 13.6 in the South. In this context of strong spatial imbalances and strong differences in the productive structure across the territory, inter-regional mobility might play a relevant role for overcoming the mismatch between the demand and supply of skills.

Recently few studies have investigated this issue finding different results. Croce and Ghignoni (2011) show that for workers holding an upper secondary degree the risk of overeducation decreases with commuting time, while among the university graduates

[1] In 2012, according to Eurostat data, the lowest proportion of higher education graduates in Europe was found in Italy (21.7%), followed by Romania (21.8%) and Malta (22.4%).

migration reduces overeducation. This second result is questioned by Devillanova (2013), showing that when the characteristics of the job (or the endogeneity of migration) are controlled for, migration displays no effect (or a positive effect) on overeducation. Finally, Iammarino and Marinelli (2012) find that migration reduces overeducation only in the Northern Regions where the most dynamic economic and innovation systems are located.

All these studies neglect the possible role of labour market entry channels in affecting migration decisions and overeducation. In Italy, workers find a job mainly through informal channel (family and friends referrals)[2]. While, in principle, social ties can be an effective mechanism to overcome information asymmetries, thus allowing for a better matching between employers and employees, most empirical studies on Italian data have found that the use of the personal channel is associated to lower wages (Pistaferri; 1999; Pellizzari; 2004; SylosLabini, 2004; Meliciani and Radicchia, 2011) and a higher probability of overeducation (Meliciani and Radicchia, 2011). However, these studies have neglected the possible indirect effects of the informal recruitment channel on education-job mismatches through their likely impact on spatial flexibility. The purpose of this paper is to fill this gap by linking the choice of the recruitment channel to migration decisions and to the phenomenon of overeducation. In particular, we estimate probit models with self-selection using ISFOL survey data providing information on labour market entry channels, job related migration and a "subjective" measure of overeducation.

Our main hypothesis is that the use of family and friends referrals limits the extent of job search to the local labour market, thus reducing spatial flexibility and increasing the risk of education-job mismatches. The existence of such an effect would have important consequences on the design of effective policies devoted to reduce skills imbalances, suggesting that this outcome may be achieved not only by improving vocational education and training systems but also by better organising employment services with the purpose of enhancing mobility.

The remaining of the paper is organised as follows. Section 2 discusses two stands of literature that have not communicated so far, i.e. that on spatial mobility and overeducation and that on recruitment channels and job mismatches, and introduces our main research hypotheses. Section 3 discusses the data and methodology. Section 4 presents the results of the empirical analysis. Finally, Section 5 draws the main conclusions and policy implications.

2. Review of the literature and research hypotheses

In this Section we will briefly review two stands of literature that have not communicated so far: that on the relationship between spatial mobility and overeducation and that on the link between the informal recruitment channel and employer-employees mismatches. We will then try to link the main findings of these lines of investigation to introduce our main research hypotheses.

2.1 Spatial flexibility and overeducation

In the economic literature the relevance of the spatial dimension on overducation has been studied separately, in relationship with international migration and internal mobility

[2]In 2011 the percentage of workers finding a job through the informal channel was over 30%.

(commuting and/or migration across local labour markets)[3]. The results of these two streams of literature differ in terms of the impact of migration on overeducation. In particular, while in the international migration literature several studies establish that migrants are characterized by a higher probability of being overeducated relative to the native population in the country of destination, the link between internal migration and overeducation remains uncertain. Some studies, such as Büchel and Battu (2003) or Büchel and Van Ham (2003) have highlighted the role of regional labour market as a potential explanatory variable of overeducation. The central aspect of the analysis of Büchel and van Ham (2003) consists in analysing 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. In specific, they develop a theoretical framework relating the existence of overeducation at the individual level with the availability of job opportunities: an individual searching for job in a given 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 option consists in accepting a job in a different local labour market, probably assuming a commuting distance higher than desired. Their results show that the possibility of acceding to wider geographical areas when searching for job decreases the probability of being overeducated. Similarly Hensen et al. (2009) find – for Dutch graduates – that those who are geographically mobile have a higher probability of finding jobs suitable for the acquired educational level as well as permanent or full time jobs. In fact, they analysed separately five education-job mismatches: jobs (i) at or below the acquired education level; (ii) within or outside the study field; (iii) with permanent or flexible contracts; (iv) with full- or part-time contracts; and (v) paid below or above the average wage controlled for the previous mismatches. The measure of spatial flexibility is the Euclidean distance between the municipal location of education (implicitly assumed as the residential place) and the location of the current job, 18 month after graduation. Jauhiainen (2011) examined the effect of location on overeducation[4] from Finnish census data, also in a gender perspective. He finds that the probability of being overeducated decreases in a large labour market (metropolitan area, university city, or regional centre) and only for long distance (or interregional) migration[5]. But the marginal effect reveals some gender differences: the probability of women being overeducated varies less between regional categories than it does for men. He explains this aspect with the problem of gender segregation in the labour market in Finland. Women work frequently in the service sector or in the public sector that are spatially less concentrated than jobs in the private sector. In Italy, only recently there have been some studies analysing the relevance of spatial flexibility in the local labour market on the individual risk of being overeducated. Croce and Ghignoni (2011), using the same data of the present paper (but the Isfol Plus 2005 cross section) find that, on the overall sample, both variables measuring spatial mobility (commuting time and migration) have a negative and significant coefficient in the overeducation equation, while the distinct regressions for upper-secondary and tertiary graduates show mixed results: the risk of overeducation decreases only with commuting time for upper-secondary graduated, while having moved for working reasons affects the quality of your match only among the university graduates. This second result is questioned by Devillanova (2013) showing that when the characteristics of the job are controlled for,

[3]Devillanova (2013) discerns that the two research areas have developed independently, ignoring each other.
[4] Overeducated individuals are identified with a statistical measurement method.
[5] Even if short-distance migration seems to increase the probability of being overeducated.

migration displays no effect (or a positive effect) on overeducation[6]. On the contrary, the effect of commuting is statistically significant and robust across different specification, although quantitatively low. Finally, Iammarino and Marinelli (2012), focussing on the impact of interregional migration on job mis-matching of the graduate's professional career[7], find that migration reduces overeducation only in the North Italy where the most dynamic regional economic and innovation systems are located.

2.2 The informal recruitment channel and employer-employees (mis)matches

Social ties can be an effective mechanism to overcome problems of asymmetric information between employers and employees in the labour market, thus allowing for a better matching. However, empirical studies investigating the impact of the informal recruitment channel (in particular, relative and friends) on workers' remuneration and on other measures of workers' satisfaction have found contrasting results.

Most of the literature focussing on the Unites States has shown the higher wages, higher productivity, lower turnover and higher tenure of referred workers (Cocoran et al., 1980; Datcher, 1983; Simon and Warner, 1992; Korenman and Turner, 1994; Holzer, 1997; Rosenbaum et al. 1999; Marmaros and Sacerdote, 2002). Recently, however, a few studies conducted mainly in Europe (Pistaferri, 1999; Addison and Portugal, 2002; Pellizzari, 2004; Delattre and Sabatier, 2007), and/or focussing on contacts with friends and relatives and excluding professional ties (Bentolila et al., 2004; Sylos Labini, 2004; Antoninis, 2006; Loury, 2006) have shown opposite results, finding that people entering the labour market through personal contacts receive on average lower wages.

Bentolila et al. (2004) present a model where social contacts induce some workers to undertake careers in industries, professions, or firms where their comparative productive advantage is not fully exploited. The use of personal contacts as a labour market entry channel can create job-worker mismatches, which in turn may depress aggregate productivity and the returns to firms' investment.

The existence of such mismatches associated to the use of the informal recruitment channel seems to characterise the Italian labour market. In fact, empirical studies conducted in Italy mainly found a negative impact of the informal recruitment channel on wages. Pistaferri (1999) using the 1991 and 1993 Survey of Households Income and Wealth conducted by the Central Bank of Italy finds that the use of the informal channel reduces wages. He states that one possible interpretation of this result is that due to high hiring costs firms use informal networks when they have to fill low skill positions. The negative coefficient on the informal channel would therefore reflect lower unobserved skills and abilities.

Pellizzari (2004), using data from the European Community Household Panel covering the period 1994-1999, also finds that in Italy people entering the labour market via personal contacts receive on average lower wages but that wage differentials tend to disappear with tenure. He concludes that lower wages cannot be due to compensating differentials (other advantages due to the use of the informal channel) but are more likely to depend on

[6] Also Devillanova uses data from the 2005 Isfol Plus cross section.

[7] Iammarino and Marinelli use the date of the "Indagine sull'inserimento professionale dei Laureati (ISTAT 2010) and an indicator of educational (mis)matching which takes simultaneously into account (a) the formal educational requirements of the employer, and (b) the graduates' self-assessment with respect to the competences and skills require to perform their job.

mismatches. He presents a model consistent with this result where employers invest more in formal recruitment activities for high productivity jobs so that matches created through formal channels are likely to be of average better quality than those created through informal networks.

Sylos Labini (2004), using data from a survey run by the Italian National Bureau of Statistics (ISTAT) in 1998 on University graduates, finds that the use of the informal channel has a different impact on wages when distinguishing between family and professional ties, with family contacts leading to a wage discount and professional ones to a wage premium. He also finds that family ties tend to reduce the time spent searching. The results are consistent with his model predicting a different impact of professional and family ties on wages.

Mosca and Pastore (2008) find that informal networks bring with them a wage penalty in the state sector, where formal hiring methods are common, and a wage premium in social cooperatives and religious institutions, where formal hiring methods are not common. They explain this result arguing that nonprofit organisations prefer informal recruitment methods not for nepotistic reasons, but for better selecting the most motivated workers.

Finally, Meliciani and Radicchia (2011), using ISFOL data, find that, while workers entering the labour market via "professional ties" enjoy a wage bonus and a reduction in entry times, those recruited via "family and friends" referrals save on entry times but receive on average lower wages. Moreover, the use of the family channel reduces the returns to education and is associated with the phenomenon of "over-education", suggesting the existence of some mismatches between workers' and jobs' characteristics.

Overall, the studies focussing on Italy suggest that, in this country, the use of the informal channel, rather than reducing information asymmetries between employers and employees increases the probability of job-workers mismatches, thus contributing to the phenomenon of overeducation.

2.3 Research hypotheses

On the one hand, the literature on spatial flexibility and overeducation has shown that in Italy, or at least in some parts of the Italian territory, some forms of spatial mobility reduce overeducation. At the same time, the literature on the impact of family and friends referrals on the performance of workers in the labour market has found that the use of personal contacts is likely to increase job-workers mismatches. Until now, these two stands of literature have remained separated. However, it is likely that the choice of the recruitment channel impacts on the degree of workers' spatial mobility.

In particular, our main hypothesis is that the use of personal contacts as a labour market entry channel reduces the probability of finding a job in distant places with a negative impact on spatial mobility. If migration is inversely related to education-job mismatches, the use of the informal recruitment channel indirectly favours overeducation. Moreover, we also expect a direct (positive) impact of family and friends referrals on overeducation. In fact, the availability of social contacts and the opportunity to find a job more easily may convince a worker to sacrifice his productive comparative advantage, thus creating a mismatch between workers' competencies and their occupational choices (Bentolila et al., 2004; Meliciani and Radicchia, 2011).

Previous studies have shown that the relationship between migration and overeducation in Italy is not so clear cut, and, in particular, it may vanish when accounting for job characteristics (Devillanova, 2013) or it may be specific to some parts of the territory (Iammarino and Marinelli, 2012). A final aim of this paper is to further investigate the relationship between spatial flexibility and overeducation in Italy, distinguishing between migration in the public and in the private sector and between migration directed to different areas of the Italian territory (North-West; North-East; Centre and South).

Overall, finding empirical support for our hypotheses would suggest that policies devoted to improve labour market entry channels might have important positive effects on education-job matches, thus increasing the returns to education, labour productivity and the quality of jobs. Moreover, such policies should not neglect the importance of favouring spatial flexibility by enhancing the probability of education-job matches occurring also outside the local labour market.

3. Data and econometric methodology

The study uses data from the survey Isfol Plus[8] (Participation Labour Unemployment Survey, cross section 2011) focusing on the characteristics and the expectations of over 40.000 individuals in the labour market in Italy, in 2011. The survey collects many information regarding occupational choice, like monthly wage, hours worked per week, job experience, sector of employment, type and size of enterprise, type of contract (permanent or fixed term), educational certification, attainment, particular skills and competencies and obviously on geographic mobility. In particular, to measure spatial mobility we have two indicators: commuting (measured as distance from the workplace in minutes) and internal migration for job, directed to different areas of the Italian territory (North-West; North-East; Centre and South).

The workers' self-assessment measure of over education can be constructed from the following question: "is your educational level relevant to perform your job?" and by defining as overeducated those employees with a level of education higher than the compulsory school answering "no" to the above mentioned question.

The survey also gives answers to the question "How did you get your current job?", offering a rich detail of the research methods used, both formal (through private or public employment service, by means of temporary-employment agency, via school or university, or by inserting or answering adverts in newspapers, by applying to the employer directly, by public competition, by starting own business or joining family business) and informal,

[8]PLUS (Participation Labour Unemployment Survey) is a sample survey on the Italian labour market supply (see Mandrone E. and Radicchia D., 2012) . The Survey annually samples, on average, 40,000 individuals, contacted through a dynamic CATI system without proxy interviews. Since the second wave of the survey (2006),it is characterized by an extensive number of panel observations (about 65%). The survey sample design is stratified over the Italian population aged 18-64. Strata are defined by regions, type of city (metropolitan/not metropolitan), age (5 classes), sex, and employment status(employed, unemployed, student, job retired, other inactive/housewife). The distribution of the sample is obtained through a multi-domain allocation procedure, developed specifically for the project PLUS (see Giammatteo, M., 2009). The extraction of the sample provides a process for quota. The reference population is derived from the annual averages of the Istat Labour Force Survey. The sixth edition of this annual survey came out in the second half of 2014.The Isfol Plus data are available online by accessing the open data section http://www.isfol.it/open-data-delle-ricerche/isfol-microdati.

making a distinction between people who get job by contacts with relatives and friends and through working and professional ties. Respondents can choose only one answer.

The employed group involves 16,115 individuals but we limit our study to the impact of personal contacts on overeducation and spatial flexibility, therefore the initial sample consist of 13,097[9] employees with a level of education higher than the compulsory school.

Table 1 shows how the incidence of overeducation differs considerably by spatial flexibility (37% for no migrant and 28% for migrant) suggesting a negative relationship between migration and overeducation. The table also shows that the percentage of individuals that are overeducated changes significantly according to labour market entry channels[10]. In particular, the use of personal contacts increases education-job mismatches. Also the incidence of spatial flexibility (5.6%,) varies by channels: from the maximum of 10% of the public competition and the minimum of 1.30% of private recruitment agencies, but also the use of informal contact (family and friends) reduces the incidence of internal migration to 3.5%. A preliminary descriptive analysis seems to confirm the research hypotheses.

Table 1 – Incidence % of overeducation by spatial flexibility and labour market entry channels

	No spatial flexibility		*Spatial flexibility*		*% Spatial flexibility*		*Entry channels*	
Employees with a level of education higher than the compulsory school by entry channels	% Over-education	Std. Dev	% Over-education	Std. Dev	%	Std. Dev	%	Std. Dev
Public employment service	45.17	0.498	46.63	0.499	8.76	0.283	2.92	0.165
Temporary-employment agency	58.88	0.492	71.30	0.452	2.97	0.170	2.54	0.154
Private recruitment agencies	49.94	0.500	34.32	0.475	1.30	0.113	1.11	0.103
School or university	16.71	0.373	8.71	0.282	4.53	0.208	3.75	0.186
Insert or answer adverts in newspaper	35.98	0.480	23.78	0.426	4.69	0.211	4.15	0.195
Professional informal contact	41.30	0.492	52.41	0.499	6.79	0.251	6.83	0.247
Informal contact (Family or friends)	51.82	0.500	52.70	0.499	3.52	0.184	24.67	0.425
Direct application	40.26	0.499	27.99	0.449	4.36	0.204	17.47	0.373
Public competition	15.83	0.365	15.20	0.359	10.08	0.301	24.83	0.426
Start own business or join family business	40.28	0.490	18.90	0.391	2.80	0.165	11.39	0.312
Total	37.13	0.484	28.37	0.451	5.63	0.227	100.0	

Source: ISFOL-PLUS 2011

[9]The regression introduces many control variables (for example occupational characteristics) that reduce the sample to about 11,000 employees.

[10]In Italy, the main strategies to get a job is through informal contacts and public competition. In the Plus survey the informal channel involves the 30% of the employees with a level of education higher than the compulsory school, but it makes a distinction between people that find job through family and friends referrals (about 25%) and workers that find job via professional ties (about 7%).

The descriptive analysis suggests a negative relationship between migration and overeducation, a positive relationship between the use of the informal channel and overeducation and a negative relationship between the use of the informal channel and internal migration. However, the existence of a "causal" effect of the informal channel on migration and overeducation can only be assessed in a regression framework controlling for other factors affecting overeducation and migration, taking into account of possible "selection biases" and of the possible endogeneity of migration decisions. Therefore, in the regression analysis, we estimate the following equations:

$$Pover_i = \alpha_1 + \beta_1 Migr_i + \gamma_1 Inf_i + \delta' \mathbf{X}_i + u_i \qquad (1)$$

$$Pwork_i = \alpha_2 + \zeta' \mathbf{Y}_i + \varepsilon_i \qquad (2)$$

$$Pmigr_i = \alpha_3 + \gamma_3 Inf_i + \theta' \mathbf{Z}_i + \psi_i \qquad (3)$$

where $Pover_i$ is the probability of being overeducated of individual *i*, *Migr* is a dummy variable equal to one for people who have migrated to find a job, *Inf* is a dummy variable equal to one for people entering the labour market through the use of the informal channel, and ***X***, ***Y*** and ***Z*** are vectors of individual and job related characteristics assumed to affect respectively the probability of being overeducated, of working and of migrating.

In particular in equations (1) and (3) we control for gender, the age (4 classes), the Provinces, the type of city (metropolitan/not metropolitan), the educational level (secondary school graduation or university), type of secondary school (Liceo or technical), the years of schools lost (failed), the past training course, own particular skills and competencies, the type of contract, the level of qualification, the business sector, the type and size of firms, the recruitment channels and marital status. In equation (2) all occupational variables are not included since they would perfectly identify people employed, while we introduce the number of components of the family as instrument.

As stated in Section 2.3, our main hypotheses are that the use of the informal channel increases overeducation and reduces migration, while migration reduces overeducation: $\beta_1<0$; $\gamma_1>0$ and $\gamma_3<0$.

The estimation of the three equations above should cope with two methodological issues concerning sample selection and the possible endogeneity of migration choices. As far as the first issue is concerned, overeducation can be observed only if the individual actually works and there could be some unexplained factors that affect both the probability of being overeducated and the probability of self-selecting into work leading to biased estimates. For this reason we estimate equations (1) and (2) with the Heckman probit model using as instrument in the employment equation the number of members in the household (as in Devillanova, 2013). Secondly, there could be some unobserved factors affecting both the choice to migrate and the probability of being overeducated again leading to biased estimates. Croce and Ghignoni (2011), using as instrument long-term unemployment at origin, find no evidence of the endogeneity of migration. However, Devillanova (2013) criticizes the instrument proposed by Croce and Ghignoni and uses as an instrument the housing arrangement. Following Devillanova we use the same instrument but we do not find

evidence of endogeneity of migration so that equation (3) is estimated independently from the other equations using a probit model.

4. Empirical results

Tables 2 and 3 report the results of the estimations. In table 2 the overeducation equation does not include occupational variables that are instead introduced in Table 3. In each table column (1) reports the estimates of the probit regression, column (2) of the two step Heckman selection model, column (3) reports the estimates of the selection equation and column (4) the estimates of the probability to migrate.

Consistently with Devillanova (2013), we find that, while in the estimates that do not include occupational variables migration significantly reduces overeducation, the variable loses significance when controlling for occupational variables. Again, in line with Devillanova (2013) and Croce and Ghignoni (2011), we find that commuting time is inversely related to overeducation in all regressions. However, differently from Devillanova, we do not find evidence of endogeneity of migration using the instruments that he suggests (the housing arrangement). On the other hand, we find a significant lambda coefficient in the Heckman procedure confirming the concern that the probability of being overeducated might be significantly correlated with the probability of being employed. Since this result holds across all specifications, our comments refer to the estimates of the two steps Heckman procedure.

The main concern of our paper is to assess the impact of the informal channel on overeducation. Consistently with our expectations, regression results both including and excluding occupational variables show that workers entering the labour market through the informal channel (family and friends referrals) have a higher probability of being overeducated and a lower probability to migrate. Regression results also show that overeducation is lower for university graduates with respect to people with only secondary education (university also increases the probability to be employed and the probability to migrate), while it is higher for people who have failed in their studies. Other interesting robust effects are the negative impact of having attended a training course on the probability of being overeducated (having attended a training course also increases the probability of being employed and the probability to migrate) and the higher probability of being overeducated in urban areas and, as expected, for foreigners. Finally, less expected is the evidence that overeducation is higher for singles and for people with sons while it is lower for women with sons.

Table 2 - Regression results of overeducation equation without occupational variables

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
Migrant	-0.157**	-0.133**		
	(0.0611)	(0.0522)		
Commuting time	-0.00491***	-0.00428***		0.00455***
	(0.000845)	(0.000720)		(0.000981)
Foreigner	0.918***	0.762***	0.0519	-0.0269
	(0.143)	(0.132)	(0.0901)	(0.222)
Gender (woman=1)	0.00797	-0.0722**	-0.177***	-0.181***
	(0.0359)	(0.0323)	(0.0215)	(0.0574)
Sons	0.249***	0.202***	-0.117***	-0.0753
	(0.0607)	(0.0545)	(0.0428)	(0.106)
Woman*sons	-0.264***	-0.193***	0.0659*	-0.0122

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
	(0.0545)	(0.0496)	(0.0349)	(0.0825)
Type secondary (Liceo)	0.144***	-0.0106	-0.307***	0.0887*
	(0.0325)	(0.0341)	(0.0187)	(0.0474)
University	-0.567***	-0.319***	0.381***	0.205***
	(0.0335)	(0.0469)	(0.0196)	(0.0492)
Failed	0.225***	0.185***	0.00120	-0.0898
	(0.0364)	(0.0334)	(0.0235)	(0.0613)
Metropolitan City	0.202***	0.181***	0.0441	-0.160
	(0.0744)	(0.0657)	(0.0449)	(0.111)
North West	0.215	0.460	0.649***	-0.349
	(0.362)	(0.312)	(0.186)	(0.599)
North East	0.692*	0.773**	0.398*	0.463
	(0.401)	(0.346)	(0.220)	(0.594)
Centre	0.643*	0.681**	4.899	0.452
	(0.379)	(0.326)	(46.57)	(0.575)
Single	0.199***	0.146***	-0.138***	-0.0566
	(0.0509)	(0.0456)	(0.0356)	(0.0858)
Divorced	-0.00282	0.0252	0.0837	-0.0452
	(0.0770)	(0.0689)	(0.0544)	(0.128)
Widower	0.0156	-0.158	-0.389***	0.0664
	(0.125)	(0.110)	(0.0695)	(0.161)
Age 30-39	-0.0774**	0.140***	0.451***	-0.0638
	(0.0391)	(0.0431)	(0.0267)	(0.0640)
Age 40-49	-0.203***	0.155**	0.770***	-0.0342
	(0.0547)	(0.0658)	(0.0402)	(0.0834)
Age over 49	-0.475***	-0.225***	0.394***	-0.0925
	(0.0470)	(0.0562)	(0.0340)	(0.0740)
Skills (languages and pc)	-0.302***	-0.0507	0.420***	0.227
	(0.0811)	(0.0776)	(0.0456)	(0.158)
Training course	-0.375***	-0.119***	0.499***	0.232***
	(0.0291)	(0.0419)	(0.0189)	(0.0420)
Informal channel (Family and friends)	0.417***	0.342***		-0.318***
	(0.0302)	(0.0322)		(0.0573)
N. of component= 2			-0.246***	-0.284***
			(0.0356)	(0.0848)
N. of component= 3			-0.0579*	-0.176
			(0.0338)	(0.112)
N. of component> 3			-0.0487	-0.195*
			(0.0339)	(0.114)
Housing arrangement: Rent				0.440***
				(0.0608)
Housing arrangement: Young Adult Living				-0.292***
				(0.108)
Provincial fixed effect	Y	Y	Y	Y
Constant	-0.265	-1.335***	-1.031***	-1.647***
	(0.347)	(0.318)	(0.173)	(0.551)
Athrho		0.883***		
		(0.157)		
Observations	11,283	26,796	26,796	11,066
Smith-Blundell test of exogeneity of migration: 1.020038 Chi-sqr(1) P-value = .3125				

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Looking at occupational variables (Table 3), we find, as expected, that overeducation is lower for people with higher qualifications, it is higher in private firms and in firms with temporary contracts. There are also significant differences across sectors with overeducation being higher in agriculture, industry and the commercial sector and lower in construction (base category Services). Migration is lower in the industrial sector and is higher in medium and large firms with respect to small firms, while there is no significant difference between private and public employment.

Due to the lack of significance of migration on overeducation in the equation including occupational variables, we tried to assess which variable was responsible of the results and we found that migration loses significance when the dummy for employment in private firms is introduced in the regression. Since overeducation is much more likely to happen in private firms (45%) than in public ones (19%), we decided to estimate the relationship between migration and overeducation focussing only on the private sector.

Table 3 - Regression results of overeducation equation with occupational variables

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
Migrant	-0.0954	-0.0838		
	(0.0661)	(0.0575)		
Commuting time	-0.00354***	-0.00319***		0.00431***
	(0.000871)	(0.000754)		(0.00101)
Foreigner	0.624***	0.524***	0.00357	0.0855
	(0.143)	(0.130)	(0.0911)	(0.224)
Woman	0.0694*	-0.0102	-0.171***	-0.178***
	(0.0385)	(0.0356)	(0.0217)	(0.0604)
Sons	0.241***	0.198***	-0.129***	-0.0622
	(0.0646)	(0.0587)	(0.0430)	(0.108)
Woman*sons	-0.224***	-0.164***	0.0699**	-0.0157
	(0.0578)	(0.0531)	(0.0351)	(0.0848)
Type secondary (Liceo)	0.218***	0.0676*	-0.305***	0.0973**
	(0.0344)	(0.0367)	(0.0188)	(0.0484)
University	-0.278***	-0.0929**	0.384***	0.155***
	(0.0375)	(0.0414)	(0.0197)	(0.0527)
Failed	0.180***	0.152***	0.00249	-0.0816
	(0.0385)	(0.0352)	(0.0237)	(0.0629)
Metropolitan City	0.217***	0.200***	0.0473	-0.0819
	(0.0764)	(0.0687)	(0.0452)	(0.115)
North West	0.108	0.367	0.683***	-0.386
	(0.360)	(0.315)	(0.186)	(0.596)
North East	0.542	0.645*	0.421*	0.499
	(0.410)	(0.360)	(0.220)	(0.595)
Centre	0.349	0.441	4.782	0.511
	(0.382)	(0.334)	(17.17)	(0.575)
Single	0.146***	0.105**	-0.141***	-0.0151
	(0.0532)	(0.0480)	(0.0359)	(0.0863)
Divorced	0.0108	0.0280	0.0805	-0.0136
	(0.0833)	(0.0752)	(0.0548)	(0.127)
Widower	-0.00308	-0.169	-0.393***	0.104
	(0.131)	(0.118)	(0.0700)	(0.161)
Age 30-39	0.0151	0.206***	0.463***	-0.0471
	(0.0409)	(0.0430)	(0.0269)	(0.0657)
Age 40-49	-0.0149	0.291***	0.780***	-0.0688
	(0.0584)	(0.0640)	(0.0404)	(0.0865)
Age over 49	-0.115**	0.0682	0.414***	-0.142*
	(0.0518)	(0.0524)	(0.0340)	(0.0784)
Skills (languages and pc)	-0.122	0.0806	0.423***	0.173
	(0.0868)	(0.0808)	(0.0458)	(0.159)
Training course	-0.261***	-0.0396	0.504***	0.205***
	(0.0309)	(0.0394)	(0.0189)	(0.0436)
Informal channel (Family and friends)	0.270***	0.231***		-0.206***
	(0.0322)	(0.0291)		(0.0601)
High level qualification *(Base cat. low qualification)*	-1.122***	-0.960***		0.0540
	(0.0561)	(0.0641)		(0.0911)
Median level qualification	-0.580***	-0.489***		-0.000871
	(0.0468)	(0.0469)		(0.0844)
Agriculture (base cat. Services)	0.488***	0.410***		-0.295
	(0.109)	(0.0954)		(0.199)
Industry sector	0.160***	0.142***		-0.223***

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
	(0.0472)	(0.0408)		(0.0865)
Construction sector	-0.203***	-0.169**		-0.145
	(0.0772)	(0.0667)		(0.136)
Commercial sector	0.600***	0.505***		-0.0110
	(0.0387)	(0.0415)		(0.0704)
Fixed term contract	-0.233***	-0.205***		0.0117
	(0.0316)	(0.0276)		(0.0511)
Private firms	0.351***	0.310***		-0.0311
	(0.0461)	(0.0411)		(0.0646)
Medium firms (15-100)	0.00619	0.00928		0.267***
	(0.0409)	(0.0348)		(0.0694)
Large firms (over 100)	0.00948	0.0101		0.271***
	(0.0426)	(0.0365)		(0.0706)
N. of component= 2 (Base cat. 1 comp.)			-0.239***	-0.255***
			(0.0363)	(0.0862)
N. of component= 3			-0.0411	-0.144
			(0.0345)	(0.114)
N. of component> 3			-0.0297	-0.183
			(0.0345)	(0.117)
Housing arrangement: Rent				0.425***
				(0.0618)
Housing arrangement: Young Adult Living				-0.275**
				(0.111)
Provincial fixed effect	Y	Y	Y	Y
Constant	-0.207	-1.240***	-1.108***	-1.786***
	(0.352)	(0.326)	(0.172)	(0.562)
Athrho			0.781***	
			(0.134)	
Observations	11,115	26,628	26,628	10,904
Smith-Blundell test of exogeneity of migration: 3.28059 Chi-sqr(1) P-value = .0701				

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 reports the results for all equations (overeducation, employment and migration) focussing only on employment in private firms. The results show that migration reduces overeducation also when controlling for occupational variables, although the variable is significant only at 10%. Again, it is interesting to observe that the informal channel increases overeducation and reduces migration also when the sample does not include public employment. Finally, the inverse relationship between commuting time and overeducation holds also when restricting the sample to the private sector.

Table 4 - Results of overeducation equation with occupational variables in private firms

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
Migrant	-0.147*	-0.122*		
	(0.0841)	(0.0637)		
Commuting time	-0.00377***	-0.00311***		0.00550***
	(0.00104)	(0.000789)		(0.00142)
Foreigner	0.689***	0.640***	0.204**	0.174
	(0.154)	(0.127)	(0.0928)	(0.237)
Woman	0.0654	-0.0619*	-0.213***	-0.251***
	(0.0424)	(0.0364)	(0.0227)	(0.0751)
Sons	0.142*	0.166***	0.0271	-0.275
	(0.0770)	(0.0623)	(0.0493)	(0.174)
Woman*sons	-0.119*	-0.186***	-0.181***	-0.0772
	(0.0707)	(0.0573)	(0.0413)	(0.126)
Type secondary (Liceo)	0.276***	-0.00996	-0.388***	0.131*

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
	(0.0409)	(0.0464)	(0.0210)	(0.0675)
University	-0.312***	-0.117***	0.225***	0.307***
	(0.0449)	(0.0443)	(0.0222)	(0.0708)
Failed	0.175***	0.138***	0.0140	-0.0742
	(0.0447)	(0.0375)	(0.0257)	(0.0847)
Metropolitan City	0.121	0.126*	0.0587	-0.103
	(0.0879)	(0.0712)	(0.0491)	(0.147)
North West	0.185	0.550*	0.807***	-1.014
	(0.406)	(0.319)	(0.209)	(0.704)
North East	0.586	0.674*	0.543**	-0.794
	(0.465)	(0.365)	(0.243)	(0.729)
Centre	0.389	0.561*	4.722	-0.189
	(0.422)	(0.333)	(6.677)	(0.605)
single	0.105*	0.0647	-0.0996**	-0.0634
	(0.0614)	(0.0504)	(0.0407)	(0.122)
Divorced	-0.0244	0.0358	0.129**	-0.0449
	(0.108)	(0.0870)	(0.0658)	(0.219)
Widower	-0.00640	-0.247*	-0.330***	-0.419
	(0.187)	(0.147)	(0.0905)	(0.327)
Age 30-39	0.0482	0.263***	0.423***	-0.0688
	(0.0461)	(0.0416)	(0.0289)	(0.0831)
Age 40-49	0.0195	0.296***	0.553***	-0.143
	(0.0697)	(0.0629)	(0.0448)	(0.118)
Age over 49	-0.0745	-0.146***	-0.148***	-0.176
	(0.0636)	(0.0518)	(0.0411)	(0.114)
Skills (languages and pc)	-0.228**	0.0104	0.262***	0.253
	(0.111)	(0.0928)	(0.0532)	(0.233)
Training course	-0.254***	-0.0327	0.309***	0.235***
	(0.0378)	(0.0402)	(0.0222)	(0.0622)
Informal channel (Family and friends)	0.242***	0.180***		-0.210***
	(0.0340)	(0.0286)		(0.0652)
High level qualification *(Base cat. low qual)*	-1.070***	-0.794***		-0.0878
	(0.0639)	(0.0755)		(0.114)
Median level qualification	-0.540***	-0.390***		-0.0341
	(0.0517)	(0.0500)		(0.101)
Agriculture*(Base cat. Services)*	0.521***	0.374***		-0.607**
	(0.117)	(0.0928)		(0.295)
Industry sector	0.167***	0.132***		-0.228**
	(0.0501)	(0.0384)		(0.0986)
Construction sector	-0.246***	-0.164***		-0.133
	(0.0806)	(0.0631)		(0.153)
Commercial sector	0.583***	0.425***		0.0421
	(0.0412)	(0.0479)		(0.0776)
Fixed term contract	-0.259***	-0.199***		0.0154
	(0.0358)	(0.0300)		(0.0642)
Medium firms (15-100)	0.0259	0.0203		0.243***
	(0.0411)	(0.0304)		(0.0713)
Large firms (over 100)	0.0268	0.0179		0.246***
	(0.0432)	(0.0322)		(0.0736)
N. of component= 2			-0.170***	-0.369***
			(0.0399)	(0.125)
N. of component= 3			-0.0169	-0.00718
			(0.0374)	(0.182)
N. of component> 3			-0.00590	0.0389
			(0.0375)	(0.184)
Housing arrangement: Rent				0.365***
				(0.0839)
Housing arrangement: Young Adult Living				-0.619***
				(0.169)
Provincial fixed effect	Y	Y	Y	Y
Constant	0.167	-1.140***	-1.022***	-0.871
	(0.395)	(0.328)	(0.197)	(0.599)
athrho			1.106***	
			(0.194)	

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
Observations	7,220	22,796	22,796	6,553
Smith-Blundell test of exogeneity of migration: 3.421617 Chi-sqr(1) P-value = .0643				

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Since Italy is a country with large differences in income per capita and unemployment rates across geographical areas, we wanted to test whether it is especially migration towards the richer parts of the territory (North-West and North-East) that contributes to reduce overeducation.
Table 5 reports the distribution of job-related migration across different areas of the Italian territory. The table shows that the internal mobility for job (equal to 5.6% of employees with a level of education higher than the compulsory school) is mostly intra-regional migration: 54% of total migration towards the North-West is intra-regional, while the percentages of intra-regional migration in the other areas are 74% in the North-East, 67% in the Centre and 50.5% in the South. Migration from the South towards the other parts of the country concerns the 49% of migrants, while the migration from North West involves the 46% of individuals who have moved for work.

Table 5 - Distribution of job-related migration across different areas of the Italian territory

	Macro-Region of Destination				
Macro-Region of origin	North-West	North-East	Centre	South	Total
North-West	54.0	14.7	12.0	19.4	100.0
North-East	14.5	74.3	4.2	7.0	100.0
Centre	12.2	2.0	67.1	18.7	100.0
South	18.2	15.1	16.2	50.5	100.0
Total	25.9	21.0	20.2	32.9	100.0

Source: ISFOL-PLUS 2011

Table 6 reports the results of the overeducation equation (using the two step Heckman procedure) distinguishing between four different geographical areas: North-West, North-East, Centre and South.

Table 6 - Regression results of overeducation equation with occupational variables between different geographical areas

	All sample		Only Private firm		All sample		Only Private firm	
VARIABLES	Heck probit	Selection equation	Heck probit	Selection equation	Heck probit	Selection equation	Heck probit	Selection equation
Migration vs North West	-0.341**		-0.425***					
	(0.138)		(0.150)					
Migration vs North East	0.120		-0.0208					
	(0.132)		(0.138)					
Migration vs Centre	0.139		0.124					
	(0.119)		(0.139)					
Migration vs South	-0.160*		-0.115					
	(0.0897)		(0.102)					
Migration inter North West					-0.409**		-0.672***	

	All sample		Only Private firm		All sample		Only Private firm	
VARIABLES	Heck probit	Selection equation	Heck probit	Selection equation	Heck probit	Selection equation	Heck probit	Selection equation
					(0.196)		(0.228)	
Migrat to North West from outside					-0.266		-0.161	
					(0.192)		(0.206)	
Migration inter South					-0.180*		-0.109	
					(0.102)		(0.114)	
Mig. to South from outside					-0.104		-0.142	
					(0.174)		(0.215)	
Commuting time	-0.00324***		-0.003***		-0.003***		-0.003***	
	(0.00075)		(0.00079)		(0.00075)		(0.00079)	
Foreigner	0.531***	0.00375	0.590***	0.151	0.530***	0.00371	0.595***	0.151
	(0.131)	(0.0911)	(0.129)	(0.0943)	(0.131)	(0.0911)	(0.130)	(0.0943)
Woman	-0.0104	-0.171***	-0.0682*	-0.215***	-0.0110	-0.171***	-0.0684*	-0.215***
	(0.0357)	(0.0217)	(0.0364)	(0.0228)	(0.0356)	(0.0217)	(0.0365)	(0.0228)
Sons	0.198***	-0.130***	0.163***	0.0287	0.198***	-0.130***	0.162***	0.0287
	(0.0587)	(0.0430)	(0.0625)	(0.0495)	(0.0586)	(0.0430)	(0.0626)	(0.0495)
Woman*sons	-0.165***	0.0699**	-0.185***	-0.180***	-0.165***	0.0699**	-0.18***	-0.179***
	(0.0531)	(0.0351)	(0.0575)	(0.0414)	(0.0531)	(0.0351)	(0.0576)	(0.0414)
Type secondary (Liceo)	0.0679*	-0.305***	-0.0106	-0.387***	0.0682*	-0.305***	-0.00907	-0.387***
	(0.0368)	(0.0188)	(0.0461)	(0.0210)	(0.0367)	(0.0188)	(0.0461)	(0.0210)
University	-0.0907**	0.384***	-0.113**	0.226***	-0.0900**	0.384***	-0.113**	0.226***
	(0.0414)	(0.0197)	(0.0441)	(0.0222)	(0.0413)	(0.0197)	(0.0442)	(0.0222)
Failed	0.154***	0.00258	0.136***	0.0158	0.153***	0.00257	0.136***	0.0158
	(0.0352)	(0.0237)	(0.0374)	(0.0257)	(0.0352)	(0.0237)	(0.0375)	(0.0257)
Metropolitan City	0.203***	0.0474	0.124*	0.0618	0.202***	0.0474	0.121*	0.0614
	(0.0687)	(0.0452)	(0.0712)	(0.0492)	(0.0687)	(0.0452)	(0.0713)	(0.0492)
Single	0.104**	-0.14***	0.0594	-0.0995**	0.103**	-0.141***	0.0596	-0.0994**
	(0.0480)	(0.0359)	(0.0506)	(0.0409)	(0.0480)	(0.0359)	(0.0506)	(0.0408)
Divorced	0.0293	0.0803	0.0288	0.118*	0.0296	0.0804	0.0277	0.119*
	(0.0750)	(0.0547)	(0.0877)	(0.0662)	(0.0750)	(0.0547)	(0.0879)	(0.0662)
Widower	-0.170	-0.393***	-0.232	-0.340***	-0.170	-0.393***	-0.233	-0.339***
	(0.118)	(0.0700)	(0.148)	(0.0916)	(0.118)	(0.0700)	(0.148)	(0.0916)
Age 30-39	0.206***	0.463***	0.262***	0.424***	0.206***	0.463***	0.262***	0.425***
	(0.0432)	(0.0269)	(0.0417)	(0.0290)	(0.0431)	(0.0269)	(0.0417)	(0.0290)
Age 40-49	0.290***	0.780***	0.297***	0.552***	0.290***	0.780***	0.297***	0.552***
	(0.0642)	(0.0404)	(0.0629)	(0.0449)	(0.0641)	(0.0404)	(0.0630)	(0.0449)
Age over 49	0.0694	0.414***	-0.147***	-0.150***	0.0687	0.414***	-0.147***	-0.150***
	(0.0525)	(0.0340)	(0.0520)	(0.0412)	(0.0524)	(0.0340)	(0.0521)	(0.0412)
Skills (languages and pc)	0.0811	0.423***	0.0161	0.273***	0.0805	0.423***	0.0128	0.273***
	(0.0809)	(0.0458)	(0.0933)	(0.0536)	(0.0808)	(0.0458)	(0.0934)	(0.0536)
Training course	-0.0415	0.504***	-0.0317	0.310***	-0.0391	0.504***	-0.0307	0.310***
	(0.0395)	(0.0189)	(0.0402)	(0.0222)	(0.0394)	(0.0189)	(0.0402)	(0.0222)
Informal channel (Family and friends)	0.230***		0.178***		0.230***		0.178***	
	(0.0291)		(0.0285)		(0.0291)		(0.0285)	
High level qualification *(Base cat. low qual)*	-0.961***		-0.798***		-0.960***		-0.79***	
	(0.0644)		(0.0750)		(0.0641)		(0.0747)	
Median level qualification	-0.491***		-0.395***		-0.490***		-0.39***	
	(0.0471)		(0.0501)		(0.0469)		(0.0500)	
Agriculture*(Base cat. Services)*	0.411***		0.374***		0.409***		0.375***	
	(0.0956)		(0.0926)		(0.0954)		(0.0926)	
Industry sector	0.141***		0.130***		0.141***		0.130***	
	(0.0408)		(0.0384)		(0.0408)		(0.0385)	
Construction sector	-0.171**		-0.173***		-0.170**		-0.17***	
	(0.0667)		(0.0635)		(0.0667)		(0.0635)	
Commercial sector	0.505***		0.425***		0.505***		0.426***	

	All sample		Only Private firm		All sample		Only Private firm	
VARIABLES	Heck probit	Selection equation	Heck probit	Selection equation	Heck probit	Selection equation	Heck probit	Selection equation
	(0.0416)		(0.0473)		(0.0415)		(0.0473)	
Fixed term contract	-0.205***		-0.194***		-0.205***		-0.19***	
	(0.0276)		(0.0298)		(0.0276)		(0.0298)	
Private firm	0.311***				0.310***			
	(0.0411)				(0.0411)			
Medium firms (15-100)	0.00994		0.0215		0.0106		0.0216	
	(0.0348)		(0.0305)		(0.0348)		(0.0305)	
Large firms (over 100)	0.0104		0.0183		0.0109		0.0174	
	(0.0365)		(0.0324)		(0.0365)		(0.0324)	
North West		0.682***		0.807***		0.682***		0.807***
		(0.186)		(0.209)		(0.186)		(0.209)
North East		0.422*		0.505**		0.421*		0.505**
		(0.220)		(0.243)		(0.220)		(0.243)
Centre		4.781		4.701		4.769		4.725
		(10.38)		(19.26)				(19.41)
N. of component= 2		-0.240***		-0.169***		-0.239***		-0.168***
		(0.0363)		(0.0401)		(0.0363)		(0.0401)
N. of component= 3		-0.0411		-0.0168		-0.0408		-0.0166
		(0.0345)		(0.0376)		(0.0345)		(0.0376)
N. of component> 3		-0.0294		-0.00546		-0.0292		-0.00536
		(0.0345)		(0.0377)		(0.0345)		(0.0377)
Provincial fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Constant	-1.232***	-1.107***	-1.14***	-1.033***	-1.238***	-1.108***	-1.133***	-1.033***
	(0.328)	(0.173)	(0.328)	(0.197)	(0.324)	(0.172)	(0.328)	(0.197)
Athrho	0.783***		1.106***		0.784***		1.102***	
	(0.134)		(0.190)		(0.134)		(0.189)	
Observations	26,628	26,628	22,733	22,733	26,628	26,628	22,733	22,733

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The table reports the results for the whole sample (column 1) and for the sample including only people employed in the private sector (column 2) and distinguishing for the area of destination of migrants (columns 3 and 4). The results show that, when considering both the private and public sectors, not only migration towards the North West but also migration towards the South reduce overeducation, while there is no significant relationship between migration and overeducation in the other geographical areas. When focussing only on private firms, migration reduces overeducation only when it is directed towards the North-Western part of the territory. Finally, in columns (3) and (4) of table 5 we investigate whether inter-area migration (from the North-West to the North-West and from the South to the South) and intra-area migration (migration from other areas of the territory to the North-West or the South) have a differentiated impact on overeducation. The results show that only inter-area migration contributes to reduce overeducation and this holds both in the North-West and in the South. Again, in the South the results are not significant when we focus only on the private sector.

Overall our results partly confirm those found by Iammarino and Marinelli (2012), signalling differences in the impact of migration on overeducation in different areas of the Italian territory. However, while they find that only migration towards the North reduces overeducation, we find that this occurs also in the South in the sample including both private and public employment. The different results might depend on the different sample and on the different measure of migration used. First their sample includes only graduates, secondly their migrants are those individuals whose region of study is different from the region of

current employment and residence (excluding graduates who leave the region of study to go back to their home region, that are, however imperfectly identified). On the other hand, our sample includes both graduates and people with a secondary degree and our migrants are individuals that have migrated to find an occupation in the current job. As a consequence our significant results for migration within the South on overeducation might depend on the fact that our sample, differently from that of Iammarino and Marinelli, includes individuals with a secondary degree migrating for job reasons (most likely from smaller to larger towns) and individuals attending university outside their province of residence but migrating only after finding a job.

Overall, the results of our regression suggest that migration reduces overeducation in the North-Western part of the territory, what could be expected considering that this is the part of Italy with a more diffused presence of large firms employing people with higher levels of education. However, less expected is the result that only migration within the North-Western area reduces overeducation while this is not the case for migration from the South. This unexpected result is partly consistent with the observation of Devillanova (2013) who makes an attempt to establish a bridge between the literature on internal and international mobility and overeducation. It appears that in Italy migration from the South to the North resembles to international migration responding more to the need of simply finding a job rather than to the need of finding the "right" job, i.e. the job corresponding to workers' levels of education.

Going back to the main question of our paper, i.e. the impact of the informal recruitment channel on migration and overeducation, the results robustly show how this channel significantly increases the employer-employees mismatch by increasing overeducation both directly and indirectly by reducing migration. But which recruitment channels perform better than the informal one? Table 7 investigates the impact of recruitment channels different from the informal one (the base category) on migration and overeducation. Looking at the migration equation, we find that people entering the labour market through public recruitment agencies, schools and universities, reading from newspapers, professional contacts, direct applications and public competitions all have a higher probability to migrate with respect to people entering the labour market via the family and friends recruitment channel. Moreover, all these channels (with the exception of public recruitment agencies) reduce overeducation with respect to the informal one. On the other side, the impact of temporary work agencies and private recruitment agencies does not differ from that of the informal channel. These results show the lack of an efficient public and private recruitment system in Italy based on specialised agencies providing information on workers and job characteristics and allowing a better matching between employers and employees. Such a system should be implemented, as suggested also by the European Commission, in order to reduce the use of the informal channel and to increase the reward of the investment in human capital.

Table 7 - Regression results of the impact of recruitment channels different from the informal one (the base category) on migration and overeducation

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
Migrant	-0.126	-0.105*		
	(0.0853)	(0.0633)		
Commuting time	-0.00365***	-0.00299***		0.00529***

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
	(0.00105)	(0.000785)		(0.00144)
Foreigner	0.681***	0.624***	0.205**	0.168
	(0.156)	(0.127)	(0.0928)	(0.237)
Woman	0.0614	-0.0685*	-0.213***	-0.269***
	(0.0427)	(0.0361)	(0.0227)	(0.0758)
Sons	0.150*	0.169***	0.0301	-0.265
	(0.0772)	(0.0619)	(0.0494)	(0.174)
Woman*sons	-0.114	-0.183***	-0.181***	-0.0775
	(0.0710)	(0.0567)	(0.0413)	(0.127)
Type secondary (Liceo)	0.276***	-0.0213	-0.388***	0.139**
	(0.0410)	(0.0470)	(0.0210)	(0.0681)
University	-0.297***	-0.0972**	0.225***	0.310***
	(0.0450)	(0.0443)	(0.0222)	(0.0709)
Failed	0.175***	0.136***	0.0135	-0.0820
	(0.0447)	(0.0369)	(0.0256)	(0.0848)
Metropolitan City	0.130	0.131*	0.0593	-0.139
	(0.0885)	(0.0706)	(0.0490)	(0.147)
North West	0.251	0.602*	0.809***	-0.957
	(0.400)	(0.310)	(0.208)	(0.697)
North East	0.630	0.705**	0.540**	-0.791
	(0.456)	(0.353)	(0.242)	(0.728)
Centre	0.460	0.609*	4.899	-0.150
	(0.416)	(0.324)		(0.600)
Single	0.117*	0.0705	-0.0980**	-0.0572
	(0.0617)	(0.0501)	(0.0407)	(0.122)
Divorced	-0.0255	0.0368	0.129**	-0.0544
	(0.109)	(0.0866)	(0.0658)	(0.219)
Widower	-0.0411	-0.274*	-0.330***	-0.418
	(0.185)	(0.143)	(0.0904)	(0.327)
Age 30-39	0.0289	0.255***	0.422***	-0.0495
	(0.0465)	(0.0417)	(0.0289)	(0.0840)
Age 40-49	0.00865	0.297***	0.551***	-0.115
	(0.0702)	(0.0628)	(0.0448)	(0.119)
Age over 49	-0.0745	-0.146***	-0.150***	-0.161
	(0.0649)	(0.0520)	(0.0411)	(0.117)
Skills (languages and pc)	-0.208*	0.0324	0.262***	0.257
	(0.111)	(0.0908)	(0.0532)	(0.233)
Training course	-0.237***	-0.0137	0.309***	0.238***
Entry Channels (family and friend)	(0.0382)	(0.0396)	(0.0222)	(0.0624)
Public recruitment agencies	-0.0546	-0.0328		0.297*
	(0.0974)	(0.0695)		(0.160)
Temporary work agencies	-0.0153	-0.0169		0.136
	(0.0879)	(0.0633)		(0.157)
Private recruitment agencies	-0.108	-0.0794		-0.233
	(0.123)	(0.0907)		(0.239)
Schools and Universities	-0.861***	-0.641***		0.283**
	(0.0994)	(0.0829)		(0.133)
Insert or answer adverts in newspaper	-0.268***	-0.204***		0.523***
	(0.0819)	(0.0610)		(0.125)
Professional informal contact	-0.209***	-0.153***		0.261**
	(0.0649)	(0.0495)		(0.112)
Direct application	-0.212***	-0.153***		0.205**
	(0.0425)	(0.0339)		(0.0798)
Public competitions	-0.486***	-0.358***		0.406***
	(0.0864)	(0.0682)		(0.123)
Start own business or join family business	-0.283***	-0.209***		-0.136
	(0.0676)	(0.0524)		(0.144)
High level qualification *(Base cat. low qual.)*	-1.051***	-0.765***		-0.0844
	(0.0643)	(0.0757)		(0.116)
Median level qualification	-0.527***	-0.371***		-0.0463

VARIABLES	Probit Over education (1)	Heck probit Over education (2)	Selection equation Employed (3)	Probit Migration (4)
	(0.0517)	(0.0497)		(0.102)
Agriculture (Base cat. Services)	0.513***	0.359***		-0.528*
	(0.117)	(0.0916)		(0.297)
Industry sector	0.155***	0.122***		-0.204**
	(0.0504)	(0.0376)		(0.0991)
Construction sector	-0.247***	-0.159**		-0.110
	(0.0808)	(0.0626)		(0.153)
Commercial sector	0.564***	0.402***		0.0655
	(0.0416)	(0.0478)		(0.0791)
Fixed term contract	-0.245***	-0.185***		-0.0530
	(0.0376)	(0.0309)		(0.0686)
Medium firms (15-100)	0.0113	0.00924		0.216***
	(0.0420)	(0.0303)		(0.0728)
Large firms (over 100)	0.0175	0.0115		0.212***
	(0.0443)	(0.0323)		(0.0746)
N. of component= 2			-0.168***	-0.347***
			(0.0397)	(0.126)
N. of component= 3			-0.0174	0.0110
			(0.0372)	(0.180)
N. of component> 3			-0.00761	0.0513
			(0.0373)	(0.182)
Housing arrangement: Rent				0.385***
				(0.0841)
Housing arrangement: Young Adult Living				-0.631***
				(0.166)
Provincial fixed effect	Y	Y	Y	Y
Constant	0.303	-1.066***	-1.023***	-1.097*
	(0.390)	(0.321)	(0.196)	(0.591)
Observations	7,220	22,796	22,796	6,553
Smith-Blundell test of exogeneity of migration: 2.707659 Chi-sqr(1) P-value = .0999				
Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1				

5. Conclusions

In this paper we have tested the hypothesis that in Italy the use of the informal recruitment channel (family and friends referrals) increases overeducation both directly and indirectly by reducing migration. We have found robust results for the direct positive effect of the informal channel on overeducation both when including all firms and when focussing on employment in the private sector. This result confirms the finding of Meliciani and Radicchia (2011) and suggests that, while, in principle, social ties can be an effective mechanism to overcome information asymmetries thus allowing for a better matching between employers and employees, in the Italian case they do not perform this virtuous role. This is in line with the model of Bentolila et al. (2004) where social contacts induce some workers to undertake careers in industries, professions, or firms where their comparative productive advantage is not fully exploited.

A second important result of this paper is that individuals entering the labour market through the informal channel are less likely to migrate to find a job. This is not surprising considering that social ties tend to be geographically concentrated. However, the negative impact of social ties on migration can be a second source of mismatch to the extent that migration reduces overeducation. Previous studies investigating the relationship between migration and overeducation in Italy have found ambiguous results. In fact, while Croce and Ghignoni (2011) find that migration reduces overeducation, Devillanova (2013) argues that

the result is not robust to the inclusion of occupational variables in the overeducation equation and to controlling for the endogeneity of the migration choice. Finally, Iammarino and Marinelli (2012) show that among graduates only migration directed towards the Northern part of Italy reduces overeducation. The third aim of this paper has been to shed further light on the relationship between migration and overeducation by distinguishing between total employment and employment in the private sector and by focussing on different areas of the Italian territory separating inter-area and intra-area migration. Our empirical results show that, when focussing only on the private sector, only migration within the North-West reduces overeducation while when we include both the public and the private sector also migration within the South has a negative impact on overeducation. Surprisingly we do not find evidence of a negative impact of migration from the South to the North on overeducation. This might signal the fact that migrants from the South move in order to find any occupation rather than to find the job corresponding to the competencies acquired during their study.

To the extent that spatial flexibility helps creating a better matching between employers and employees, the use of the informal recruitment channel by reducing migration may also contribute indirectly to increase overeducation. The existence of such an effect has important consequences on the design of effective policies devoted to reduce skill imbalances, suggesting that this outcome may be achieved not only by improving vocational education and training systems but also by better organising employment services with the purpose of enhancing spatial flexibility.

In Italy, only few workers find a job through public and private employment agencies and our econometric estimates show that these channels do not perform better than the informal channel in favouring job-education matches and in enhancing spatial flexibility. On the contrary, individuals entering the labour market through schools, professional ties, reading of newspapers, direct applications and public competitions find jobs more in line with their levels of education and have a higher mobility with respect to individuals using the informal channel. An effective reform of employment services should, therefore, make these services at least as effective as more costly job search methods in order to avoid that workers remain "trapped" into occupations where their competences are not exploited. The results of our paper show that the reform of Italian employment services is crucial not only for reducing unemployment but also for enhancing human capital investment, bringing better competencies into the labour market and increasing job satisfaction and labour productivity.

Finally, although this paper has mainly focussed on the characteristics of labour supply, we are aware that the structure of labour demand plays a crucial role in contributing to overeducation in a country characterised by a diffused presence of family managed small and medium enterprises. Therefore, in the lack of industrial policies encouraging models of production and type of activities more in tune with the vocational educational skills that are present in the country, it is unlikely that the paradoxical phenomenon of overeducation in a country that relatively under-invests in high education will be effectively tackled.

References

Addison, J.T., Portugal, P. (2002), Job Search Methods and Outcomes, *Oxford Economic Papers*, 54, 505-533.

Antoninis, M. (2006), The wage effects from the use of personal contacts as hiring channels, *Journal of Economic Behaviour& Organization*, 59(1), 133-146.

Battu, H. and Büchel, F (2003). The Theory of Differential Overqualification: Does it Work?, *Scottish Journal of Political Economy*, 50(1): 1-16.

Bentolila, S., Michelacci, C., Suarez, J. (2004), Social Contacts and Occupational Choice. *CEPR Discussion Paper* n. 4308.

Blau, D.M., Robins, P.K. (1990), Job search outcomes for employed and unemployed, *Journal of Political Economy*, 98, 637-55.

Büchel, F., & van Ham, M. (2003) Overeducation, Regional Labour Markets and Spatial Flexibility, *Journal of Urban Economics*, 53(3), 482-493.

Corcoran, M., Datcher, L., Duncan, G., Information and Influence Networks in Labor Market, in Duncan and J. Morgan (eds.), Five Thousand American Families: Patterns of Economic Progress, Vol. 7, 1-37, 1998

Croce, G. and Ghignoni, E. (2011) Overeducation and spatial flexibility in Italian local labour markets, *MPRA working paper no. 29670*, October 2011.

Datcher, L. (1983), The Impact of Informal Networks on Quit Behaviour, *Review of Economics and Statistics*, 65(3), 491-495.

Delattre, E, Sabatier, M. (2007), Social Capital and Wages: An Econometric Evaluation of Social Networkings Effects, *Labour*, 21(2), 209–236.

Devillanova, C. (2013), Over-education and spatial flexibility: New evidence from Italian survey data. Papers in *Regional Science*, 92: 445–464. doi: 10.1111/j.1435-5957.2012.00434.x.

Di Pietro, G. and Urwin, P. (2006) Education and Skills Mismatch in the Italian Graduate Labour Market, *Applied Economics*, 38, 1, 79-93.

Franzini M., Raitano F. (2011). Few and Underutilized? Overeducation of Italian Graduates, in Mandrone E. (editor), L'intermediazione pubblica, privata ed informale, ISFOL, Roma.

Giammatteo, M. (2009) L'indagine campionaria Isfol-Plus: contenuti metodologici e implementazione, *Studi Isfol* 2009/3

Heckman (1979). Sample selection bias as a specification error. *Econometrica*, 47, 153–61.

Hensen, M. M., De Vries, M. R., & Cörvers F. (2009) The Role of Geographic Mobility in Reducing Education-job Mismatches in the Netherlands, Papers *in Regional Science*, 88, 3, 667- 682.

Hartog, J. (2000), Over-education and earnings: where are we, where should we go?, *Economics of Education Review*, 19, 131-147.

Holzer, H. (1988), Search method use by unemployed youth, *Journal of Labor Economics* 1988, 6, 1 – 20.

Holzer, H. (1997), Hiring procedures in the firm: their economic determinants and outcomes, in M. Kleiner, Block, R., Roomkin, M., Salsburg, S. (eds.), Human Resources and the Performance of the Firm, *Industrial Relations Research Association*, Madison.

Iammarino, S. and Marinelli, E. (2012) Education-job (mis)matching and interregional migration: Italian university graduates transition to work. *Working Paper. Birkbeck College, University of London*

Jauhiainen, S. (2011) Overeducation in the Finnish regional labour markets, Papers in *Regional Science*, 90(3), 578-588.

Korenman, S., Turner, S. (1994), On employment contacts and minority-white wage differences, *Industrial Relations*, 35, 106– 122.

Kugler, A.D. (2003), Employee referrals and efficiency wages, *Labour Economics,* 10(5), 531-556.

Loury, L.D. (2006), Some contacts are more equal than others: informal networks, job tenure, and wages, *Journal of Labor Economics*, 24(2), 299-318.

Mandrone, E., Radicchia, D (2012) Indagine Plus : il mondo del lavoro tra forma e sostanza : terza annualità / ISFOL - 475 p. I libri del Fondo sociale europeo ; 167, Rubbettino.

Marmaros, D., Sacerdote, B. (2002), Peer and social networks in job search, *European Economic Review*, 46, 870-79.

Meliciani V., Radicchia D., The informal recruitment channel and the quality of job-worker matches: an analysis on Italian survey data, *Industrial and Corporate Change*, n. 2, pp. 511-554, 2011

Montgomery, J.D. (1991), Social Networks and Labor Market Outcomes: Towards an Economic Analysis, *American Economic Review*, 81, 1408-1418.

Mosca, M., Pastore, F. (2008), Wage effects of recruitment methods: the case of the Italian social service sector, *IZA Working Paper* n. 3422.

Pellizzari, M. (2004), Do friends and relatives really help getting a good job?, *CEPR Discussion Paper*, London.

Pistaferri, L. (1999), Informal networks in the Italian labor market, *Giornale degli Economisti e Annali di Economia*, 58, 355-375.

Ramos, R. and Sanromà, E. (2011) Overeducation and Local Labour Markets in Spain, *IZA DP Working Paper* No. 6028, October 2011.

Rosenbaum, J., DeLuca, S., Miller, S., Roy, K. (1999), Pathways into work: Short- and long-term effects of personal and institutional ties, *Sociology of Education*, 72, 179-96.

Simon, C.J., Warner, J.T. (1992), Matchmaker, Matchmaker: The Effect of Old Boy Networks on Job Match Quality, Earning and Tenure, *Journal of Labor Economics*, 10(3), 306-330.

Sylos Labini, M. (2004), Social networks and wages: it is all about connections. LEM Working Paper n. 10, S. Anna School of Advanced Studies, Pisa, Italy.

Appendix

Employees with a level of education higher than the compulsory school				Informal channel		Formal channel		Migration		No migration		Overeducation		No overeducation	
Variable	Obs	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Informal channel	13097	0.236	0.425					0.284	0.451	0.374	0.484	0.332	0.471	0.180	0.384
Overducation	13097	0.369	0.483	0.519	0.500	0.323	0.468	0.152	0.359	0.241	0.428				
Spatial flexibility	13097	0.055	0.227	0.035	0.184	0.061	0.239					0.042	0.201	0.062	0.241
Commuting time	11318	19.965	19.510	18.598	18.116	20.395	19.908	24.775	22.662	19.692	19.280	17.351	16.153	21.406	20.995
Foreigner	28669	0.012	0.109	0.023	0.150	0.010	0.099	0.018	0.132	0.013	0.112	0.025	0.156	0.006	0.077
Woman	28669	0.499	0.500	0.445	0.497	0.463	0.499	0.384	0.486	0.463	0.499	0.393	0.488	0.497	0.500
Sons	28669	0.489	0.500	0.459	0.498	0.571	0.495	0.589	0.492	0.542	0.498	0.492	0.500	0.575	0.494
Woman*sons	28669	0.266	0.442	0.237	0.425	0.290	0.454	0.238	0.426	0.280	0.449	0.217	0.412	0.313	0.464
Type secondary (Liceo)	28564	0.318	0.466	0.217	0.412	0.310	0.463	0.349	0.477	0.285	0.451	0.255	0.436	0.308	0.462
University	28669	0.250	0.433	0.148	0.356	0.313	0.464	0.383	0.486	0.268	0.443	0.135	0.342	0.355	0.479
Failed	28669	0.163	0.370	0.197	0.398	0.163	0.369	0.162	0.368	0.172	0.377	0.219	0.414	0.143	0.350
Metropolitan City	28669	0.091	0.287	0.081	0.272	0.098	0.297	0.099	0.298	0.093	0.291	0.091	0.288	0.095	0.293
North West	28669	0.270	0.444	0.289	0.453	0.293	0.455	0.259	0.438	0.294	0.456	0.285	0.451	0.296	0.457
North East	28669	0.202	0.402	0.216	0.412	0.224	0.417	0.210	0.407	0.223	0.416	0.231	0.421	0.217	0.412
Centre	28669	0.203	0.402	0.220	0.414	0.207	0.406	0.202	0.402	0.211	0.408	0.226	0.418	0.201	0.401
South	28669	0.326	0.469	0.275	0.446	0.275	0.447	0.329	0.470	0.272	0.445	0.259	0.438	0.285	0.451
Single	28669	0.445	0.497	0.467	0.499	0.355	0.479	0.330	0.470	0.385	0.487	0.449	0.497	0.343	0.475
Divorced	28669	0.036	0.186	0.034	0.182	0.044	0.205	0.040	0.195	0.042	0.201	0.042	0.200	0.042	0.200
Widower	28669	0.014	0.119	0.009	0.094	0.013	0.115	0.011	0.102	0.012	0.110	0.010	0.100	0.014	0.116
Age 18-29	28669	0.259	0.438	0.232	0.422	0.137	0.344	0.115	0.319	0.162	0.369	0.212	0.409	0.130	0.336
Age 30-39	28669	0.284	0.451	0.336	0.472	0.304	0.460	0.333	0.471	0.310	0.462	0.350	0.477	0.289	0.453
Age 40-49	28669	0.236	0.425	0.276	0.447	0.308	0.462	0.297	0.457	0.301	0.459	0.268	0.443	0.319	0.466
Age over 49	28669	0.221	0.415	0.156	0.363	0.251	0.434	0.255	0.436	0.227	0.419	0.171	0.376	0.263	0.440
Skills (languages and pc)	28669	0.959	0.198	0.956	0.205	0.964	0.186	0.972	0.164	0.962	0.192	0.946	0.227	0.972	0.165
Training course	28669	0.277	0.448	0.232	0.422	0.350	0.477	0.441	0.497	0.315	0.465	0.209	0.406	0.388	0.487
High level qualification	12958	0.304	0.460	0.173	0.378	0.344	0.475	0.387	0.487	0.299	0.458	0.159	0.366	0.388	0.487
Median level qualification	12958	0.543	0.498	0.589	0.492	0.529	0.499	0.508	0.500	0.545	0.498	0.560	0.496	0.533	0.499

Employees with a level of education higher than the compulsory school				Informal channel		Formal channel		Migration		No migration		Overeducation		No overeducation	
Variable	Obs	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Low level qualification	12958	0.153	0.360	0.238	0.426	0.127	0.332	0.105	0.306	0.156	0.363	0.281	0.449	0.078	0.269
Agriculture	13097	0.025	0.157	0.032	0.176	0.023	0.151	0.013	0.112	0.026	0.159	0.042	0.200	0.016	0.124
Industry sector	13097	0.134	0.340	0.179	0.383	0.120	0.325	0.081	0.272	0.137	0.344	0.184	0.387	0.105	0.306
Construction sector	13097	0.049	0.216	0.066	0.247	0.044	0.205	0.030	0.172	0.050	0.218	0.042	0.201	0.053	0.224
Commercial sector	13097	0.146	0.354	0.207	0.405	0.128	0.334	0.078	0.268	0.150	0.357	0.239	0.427	0.092	0.289
Services sector	13097	0.646	0.478	0.517	0.500	0.685	0.464	0.799	0.401	0.637	0.481	0.493	0.500	0.735	0.442
Fixed term contract	13097	0.640	0.480	0.616	0.486	0.648	0.478	0.747	0.435	0.634	0.482	0.584	0.493	0.673	0.469
Small firms (less 15)	13097	0.388	0.487	0.546	0.498	0.339	0.473	0.198	0.399	0.399	0.490	0.466	0.499	0.341	0.474
Medium firms (15-100)	13097	0.153	0.360	0.218	0.413	0.133	0.339	0.131	0.338	0.154	0.361	0.195	0.396	0.128	0.335
Large firms (over 100)	13097	0.460	0.498	0.236	0.425	0.529	0.499	0.670	0.470	0.447	0.497	0.339	0.473	0.530	0.499

Source: ISFOL-PLUS 2011