



**Education-job (mis)matching and interregional migration.
Italian university graduates' transition to work**
Simona Iammarino*^a and Elisabetta Marinelli^{a,b}

^a London School of Economics and Political Science, Department of Geography and the Environment

^b European Commission JRC-IPTS, Sevilla, Spain

*Corresponding author: S.Iammarino@lse.ac.uk Address: Department of Geography & Environment
London School of Economics, Houghton Street, London WC2A 2AE, United Kingdom

Abstract

This paper explores the patterns of education-job (mis)matching of recent university graduates, focussing on the impact of interregional migration. With the aim of offering a place-based perspective on the topic, the paper looks at the three Italian macro-regions of the North, the Centre and the South, comparing them with the country as a whole. We use an indicator of education-job (mis)matching drawn and adapted from the literature, and apply both ordered logit and probit models with self-selection to a dataset on graduates' entry in the labour market produced by the Italian National Statistical Institute. Our results suggest that, in line with most previous studies, interregional migration contributes to reduce education-job gaps: however, we find that the analysis for Italy as a whole masks stark differences between macro-regions, for which the typical North-South dualism still holds, confirming once more the cumulative and path-dependent nature of regional development trajectories.

Key words: university education-job match, interregional migration, graduate entry in labour markets, Italian regions.

JEL classification: R1, R23, J2

Acknowledgements: The authors gratefully acknowledge the funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 266959. The authors would like also to thank the participants in the European Seminar EuroLIO Geography of Innovation, January 2012, St Etienne; AAG 2012 Annual Meeting, February 2012, New York; and Regional Studies Association European Conference, May 2012, Delft. All errors and omissions remain our own.

1. Introduction

This paper explores the patterns of education-job (mis)matching of recent Italian university graduates with specific attention to the effect of interregional migration. It is well acknowledged that graduates' entry into the labour market is a critical mechanism through which public investment in higher education bares its returns (e.g. Pavitt, 1991; Salter and Martin, 2001). Indeed, as well as carrying with them up-to-date knowledge, graduates bring into the labour market innovative attitudes and competencies to combine and use knowledge in new productive ways (e.g. Senker and Senker, 1995; Walters, 2004; von Tunzelmann and Wang, 2007). Thus, the widespread occurrence of overeducation (e.g. Groot and Maassen van den Brink, 2000; Hartog, 2000; McGuinness, 2006) – a critical type of education-job mismatching¹ – may seriously jeopardise the actual returns to public, as well as private, investment in human capital and calls for a better understanding of the transition from study to work of university graduates.

Understanding education-job (mis)matching is indeed relevant also at the micro level, as overeducated workers tend to experience lower income levels and higher dissatisfaction. It is not surprising, therefore, that migration is seen as a crucial mechanism to prevent or escape overeducation (e.g. Quinn and Rubb, 2005; Hensen et al., 2009). This is especially the case for young graduates, who are a particularly mobile segment of the society and tend to move with a job in hand, rather than to search for a job in a new location (Basker, 2002). This paper focuses on university graduates' entry into the labour market, looking in particular at how interregional migration, among other factors, impacts on their education-job match.

Our research concentrates on the Italian case, for which the relationship between education-job matching and interregional migration has not yet been fully analysed. The paper focus is on the three Italian macro-regions of the North, Centre and South (or Mezzogiorno), vis á vis the country as a whole; by considering these different geographies the study aims to give some hints on the territorial specificities of the interaction between regional demand and supply of graduates.

We use and adapt an indicator of education-job (mis)matching previously developed in the literature, and apply both ordered logit and probit models with self-selection to a dataset on graduates' entry in the labour market based on a survey carried out periodically by the Italian National Statistical Institute (ISTAT, 2010). We look at the determinants of education-job (mis)matching in Italy to test empirically whether and where interregional migration has an impact on such matching in the early stage of the graduate's professional career.

The paper is organised as follows: Section 2 briefly reviews the literature on the topic and identifies the contribution of the work; Section 3 explains the methodology, introducing the data, and defining the indicator of education-job (mis)matching and the empirical strategy applied; Section 4 discusses the econometric results, whilst Section 5 presents some concluding remarks and research directions.

2. Background of the study

The socio-spatial structure and dynamics of learning and knowledge generation and diffusion are at the core of evolutionary economic geography (Healy and Morgan, 2009). Critical to such issues is the cycle of skills and human capital formation by the university sector (i.e. the

¹ Overeducation emerges as workers are employed in jobs requiring less education than that they actually possess. This field of study was pioneered by authors such as Rosen (1972), Freeman (1976), and Rumberger (1981).

production of graduates) and the employment of those very skills. Disequilibrium in the labour market can however occur, implying that the supply of graduates is not aligned with their demand thus giving rise to overeducation, one of the dimensions of skills underutilisation or education-job mismatching.²

There are several reasons why understanding education-job (mis)matching in relation to university graduates is important (see Boudarbat and Chernoff, 2010, for a review). At the micro level of the individual, it is well established that a bad fit between acquired and required competences is associated to worse employment conditions, such as lower salary (e.g. Battu et al., 2000; Heijke et al., 2003; Di Pietro and Urwin, 2006; Robst, 2007; Dolton and Silles, 2008; Boudarbat and Montmarquette, 2009), as well as employee dissatisfaction (e.g. Roterman, 1999; Garcia-Espejo and Ibanez, 2006; Iammarino and Marinelli, 2011; Green and Zhu, 2012). At the organizational/firm level, on the other hand, education-job mismatching is reflected in lower productivity and higher turnover (e.g. Wolbers, 2003).

An additional consideration is the role of universities and their wider economic and social impact. This is a hot topic in current policy debates on how to stimulate growth and support innovative change at both national and regional scale. Thus, improving the understanding of graduates' education-job (mis)matching can help maximise the returns of public and private investment in human capital, skills and education in general (e.g. Krahn and Bowlby, 1999; Boudarbat and Chernoff, 2010). In this respect, several scholars have pointed out that the complementarity between a society's economic structure and its university system is a critical pre-requisite for economic development and sustainable growth (Redpath, 1994; Garcia-Espejo and Ibanez, 2006).³

The literature that has tried to disentangle the determinants of graduate overeducation and education-job mismatching has found that these conditions are more common in part-time or temporary jobs, in which graduates may find themselves at the beginning of their career – the so called *waiting room effect* (Dekker et al., 2002); in line with these studies, results indicate that overeducation decreases with tenure within a job (Groot and Maassen van der Brink, 2000). Scholars have also shown that graduates' education-job matching depends on the field of study (e.g. Boudarbat and Chernoff, 2010; Venhorst and Cörver, 2011) and, although the results are more mixed, on study performance measured by grades (e.g. Biggeri et al., 2001; van der Klaauw and van Vuren, 2010).

One important aspect still under-investigated in the recent research on the topic is the link between spatial mobility within countries and education-job (mis)matching.⁴ The seminal contribution of Büchel and van Ham (2003), focussing on the effect of regional characteristics and spatial mobility across labour markets in West Germany, finds support for the hypothesis of a negative relationship between mobility (i.e. in terms of possibility of commuting by car) and overeducation. In the same vein, 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. Venhorst and Cörvers (2011) obtain similar results, but they also point out that once self-selection in migration is taken into account, the effect of spatial mobility on the quality of the job match (considered in terms of wages) is reduced. In line with the study of Büchel and van Ham (2003), Ramos and Sanromà (2011) also highlight the importance of the relationship between education-job matching and spatial factors, such as

² The literature on overeducation in general is vast and spans across different research fields, such as education economics, sociology, demography, etc.. Here we restrict our attention specifically to overeducation in the case of university graduates.

³ Different views have been expressed on this issue: for an overview of the debate see Corominas et al. (2010).

⁴ A rather abundant stream of literature refers to international migration and general overeducation (i.e. not specifically at the university level). See, among others, Quinn and Rubb (2005), and Chiswick and Miller (2009).

city size and access to larger labour markets: they show that young graduates may be forced into overeducation conditions by the peripherality and lack of effective connections of their location. These results are confirmed by Croce and Ghignoni (2011), showing that barriers which increase the costs of spatial mobility across local labour markets worsen the fit between required and acquired education of graduates in Italy. Jauhiainen (2011) obtains very interesting results using Finnish census data on individual occupation and level of education (not restricted to university): while long distance (or interregional) migration decreases the risk of being overeducated, short distance (or intraregional) migration seems to raise the probability of an education-job mismatch. Interestingly, Devillanova (2011) – working on Isfol data on individuals with at least upper secondary education in Italy – seems to achieve opposite results: the study supports the hypothesis of a positive effect of spatial flexibility on education-job matching only for short distance commuting, while migration displays a direct and positive relationship with overeducation when the characteristics of the job are controlled for. This brings the author to cast some doubts on the effectiveness of internal migration in reducing the incidence of education-job mismatching, thus calling for further investigation of this topic.

The empirical studies mentioned above, while mostly indicating geographical mobility (measured in various ways) as a means of reducing overeducation or mismatch, point all invariably out the necessity to look more in depth into spatially-based explanations for overeducation. In particular, specific regional and interregional conditions can play an important role in determining whether and where graduates migration can lead to employment profiles suitable for their accumulated competencies and skills. A truly place-based, regional dimension of the phenomenon of education-job matching has so far largely been left unexplored: yet, there are first of all theoretical reasons that justify an interest in strengthening the territorial perspective on such an issue.

At the regional level, in fact, the risk of education-job mismatching is more evident than at the national scale, where demand and supply structures tend to level out (von Tunzelmann, 2009). The literature on technological change has long posited that a matching between the local stage of techno-economic development and the quality of local human capital is a necessary condition for the latter to generate regional economic growth. Particularly in evolutionary economics (e.g. Nelson and Phelps, 1965; Vandebussche et al., 2006; von Tunzelmann, 2009), the impact of graduates on economic performance and knowledge creation depends on the overall level of technological and economic development of the regional system where they are located. An advanced regional system with a strong knowledge base will benefit more from a highly skilled labour force than a backward one: in fact, for higher education investment to translate into local socio-economic benefits, the knowledge embodied in graduates needs to match or complement that embedded in the region (Rodriguez-Pose and Tselios, 2010).

The supply and demand of human capital and the mechanisms governing local labour markets of university graduates are structural features of regional innovation systems. One of the main roles played by universities is precisely to provide talented young people to the region they belong to, but retaining locally such competences and skills is not an easy task (Venhorst et al., 2011). For young graduates regional economic conditions are a key element in determining spatial mobility and the decision to migrate: human capital outflows from lagging behind regions are largely motivated by the graduates' desire to apply knowledge and competences acquired during the university study (e.g. Faggian and McCann, 2006). On the other hand, interregional flows are more intense and effective among not only geographically proximate, but also more homogenous regions: these can share labour markets, human capital and managerial talent, new technologies, and other kinds of externalities due to the concentration of firms and economic and innovative activities in macro-areas spanning across

several regions (Rodriguez-Pose and Tselios, 2010, p. 415). This acts as a typical ‘cumulative causation’ mechanism: as the full use of competencies and skills is a crucial input to both innovative activity and economic growth, graduates’ spatial movements can potentially affect the long-term dynamics of regional development (Marinelli, 2011, 2012). As such, it is somehow surprising that the geographically-specific subnational dimension of the relationship between migration and education-job matching has so far attracted so little attention: a better place-based understanding of such a relation is crucial for policy design, as also emphasised in the European Commission 2020 Employment Strategy (2009).

This paper aims at contributing to this area of research by focusing on the case of Italy, for which the links between interregional migration and education-job (mis)matching have not yet been fully explored, but are ultimately critical for regional growth and convergence. In fact, as is well known, Italy is characterised by sharp socio-economic regional differentials, with the South, or Mezzogiorno, lagging behind the rest of the country. The dualistic nature of the country has long historic roots and continues to caught much scholarly attention (among a vast literature, Mauro and Podrecca, 1994; Vaccaro, 1995; Paci and Pigliaru, 1997; Viesti, 2003; Iammarino, 2005; Barca, 2006; SVIMEZ, 2007, 2008, 2009). Whilst the typical Italian dualism is not reflected in the higher education attainment, with the Centre and the North having levels of higher education similar to those of the Mezzogiorno (e.g. Piras, 2005 and 2006; Di Liberto, 2007), there are large difference in the employment opportunities open to graduates from different parts of the country. Moreover, since the mid-1990s the Southern regions have experienced substantial outflow of graduates, that has been defined as a proper ‘brain drain’ towards the rest of the country (e.g. Piras, 2005 and 2006; Viesti, 2005; D’Antonio and Scarlato, 2007), and particularly towards highly innovative regional systems that offer more opportunities to apply their competences and skills (Svimez, 2009; Marinelli, 2011; Dotti et al., 2012). Therefore, Italy offers an interesting case study to explore further the conditions under which interregional migration may affect both employment and the matching with the educational background.

While controlling for job features, academic background and personal characteristics of the young graduates, we aim at empirically testing 1) whether the status of “migrant” within the country helps achieve a better use of knowledge and competences acquired through recent university studies, i.e. education-job matching; and (2) whether and where the regional origin (in terms of study region) of internal migrants matters in shaping education-job (mis)matching for graduates entering the labour market in Italy.

3. Data and methodology

3.1 Dataset

The paper uses the *Indagine sull’Inserimento Professionale dei Laureati* (ISTAT, 2010) conducted periodically by the Italian National Statistical Institute. The survey investigates the entrance of graduates into the labour market three years after they completed their studies. In what follows, we use the 7th edition of the survey, which was carried out in 2007 and refers to 2004 graduates. The universe of interest consists of 260,070 graduates. Of these, 167,886 are graduates in the old *laurea degree* (a degree equivalent to a Bachelor and a Master), and 92,184 were in three years degrees (Bachelors). The *Indagine* contains 47,300 observations: for our purposes here we will focus exclusively on the 26,570 representative of the *laurea degree* graduates.

The *Indagine* is characterised by one-stage stratification by gender, university and degree. Each of the surveyed individuals is attributed a sampling weight which allows to build

indicators representative at the level of nation, field of study and, most importantly for the objective of the present work, region of study and current region of residence and employment (both at the level of the 20 Italian administrative regions). In this paper we first distinguish between *stayers*, that is those whose region of study coincides with that of employment and residence, and *movers*, that is those whose region of study (origin) is different from the region of current employment and residence (destination). The latter group of movers include graduates who leave the region of study to go back to their home region – i.e. *returners* – and graduates who migrate from the university region to work in a different region, i.e. our actual *migrants*. The analysis reported in the following sections is focussed on *migrants* against *non-migrants* (stayers + returners), although the econometric model is tested using all mobility groups.⁵ Table A1 in the Appendix shows, on the basis of the Indagine's sample expanded to the universe, migrant graduates' movements across the three Italian macro-region.

3.2 Education-job (mis)matching: indicators

Different indicators and methods of measuring education-job matching have been examined in the literature (see Verhaest and Omey, 2006, and Jauhiainen, 2011 for an overview). In this paper we use an indicator of education-job (mis)matching devised by Ungaro and Verzicco (2005), 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 required to perform their job.

The *Indagine* asks graduates the following question related to the employers' educational requirement:

1a. Was the laurea degree formally required by the employer to apply for the job?

As for the self-assessment, we use the following question from the survey:

1b. Is the laurea degree effectively necessary to do the job?

Question 1b is a yes/no dichotomous variable, where *yes* (*no*) indicates that the graduate perceives her/his job as matching (non-matching) her/his competences and skills acquired through university education.

Combining the two information in question 1a and 1b above, along the lines of Ungaro and Verzicco (2005),⁶ we obtain a matrix of four possible education-job (mis)matches, as described in Figure 1:

⁵ As the survey does not provide the home region of graduates prior to their university enrolment, identifying returners requires using other information from the survey and in particular (1) whether the graduate left the home region to attend university and (2) her/his current living arrangements. With this information returners are classified as those who (a) left their home region to study, (b) are currently living in a region different than the one they studied in and (c) are currently living with their family of origin. The returners group constitutes about the 5% of the sample, and it is likely to be rather underestimated; moreover, returners' mobility pattern may be driven by different motives than those of actual migrants (see Marinelli, 2011 for more details).

⁶ See also Di Pietro and Urwin (2006) and Quintano et al. (2008) for alternative indicators based on the *Indagine*.

Figure 1 – The matrix of education-job (mis)matching

		Was the degree effectively necessary to do the job?	
		YES	NO
Was the degree formally required?	YES	OBJ_MATCH: Objective education-job match (matched qualification, full skill utilisation)	SUB_OVEREDU: Subjective overeducation (matched qualification, skill underutilisation)
	NO	SUB_MATCH: Subjective education-job match (overqualification, full skill utilisation)	OBJ_OVEREDU: Objective overeducation (overqualification, skill underutilisation)

A match or mismatch is defined as *objective* when the opinion of the graduate on the effective need of her/his qualifications is coherent with the formal requirements of the job. An objective education-job match (mismatch/overeducation) arises therefore when the graduate believes (does not believe) that her/his education level is effectively needed in the job and when the degree was (was not) also a formal requirement of the employer. Whenever the opinion of the graduate and the employer’s condition differ, on the other hand, a *subjective* match or mismatch/overeducation arises. Specifically, when a graduate feels that the degree is needed in her/his work, though the employer did not require it, the graduate is experiencing a subjective education-job match. Conversely, when the graduate is in a job for which the degree was formally required but is effectively unnecessary she/he is experiencing subjective overeducation.

Interestingly, the typologies reported above can also allow taking into account the important distinction between qualification and competencies/skills utilization, which recent studies have indicated as conceptually and empirically different (e.g. Chevalier, 2003; Green and McIntosh, 2007; Green and Zhu, 2012). In particular, of the two typologies of the matrix above that correspond to overqualification (i.e. those for which the degree was NOT formally required by the employer), only the objective overeducation represents what the literature has indicated as ‘Real overeducation’ or, in other words, the situation in which the graduate is both overqualified and overskilled; our subjective matching category is instead indicated as ‘Apparent overeducation’, as it implies a full skills’ utilization. Conversely, subjectively overeducated workers have a matched qualification but their competences and skills are perceived as underutilized; these graduates may be hired by employers who want to benefit from highly qualified labour force even in low-skilled and low-salary jobs (a phenomenon already discussed for Italy by Di Pietro and Urwin, 2006). On the other hand, subjectively matched graduates may be frustrated with their economic treatment, because employers are labeling the occupation as non-graduate in order to pay lower wages, but they experience a match between their qualification and the competences and skills required to perform the job.

The above four typologies can thus be ordered in the following way: an objective overeducation indicates the lowest degree of education-job match, followed by a subjective overeducation, a subjective match and finally an objective match. In other words, an ordinal variable of education-job (mis)match is created, comprising the following levels:

1. Objective overeducation
2. Subjective overeducation
3. Subjective match

4. Objective match

The shares of each typology in the education-job (mis)matches for both non-migrants and migrants (according to the area of origin, i.e. region of study) as from the *Indagine 2007* are reported in Table 1.

[Table 1 about here]

3.3 Method and model specification

We apply both ordered logit and probit regressions with self-selection (Miranda and Rabe-Hesketh, 2006), as the degree of education-job matching is observable only for those graduates that are actually employed (see, among others, Buchel and van Ham, 2003; Jauhiainen, 2011; Devillanova, 2011). Thus, if unobserved factors affecting the outcome (in the case here, the education-job (mis)matches) are correlated with unobserved factors affecting the selection process (i.e. whether graduates are employed or not) standard regression techniques deliver inconsistent estimators (Heckman, 1979). As migration and field of educational backgrounds can affect both employability and education-job matching, it seems particularly important to tackle this aspect. This model, based on the Heckman selection procedure, estimates two equations simultaneously: one *selection equation*, which accounts for the probability of the graduate being employed; and one *outcome equation*, where the level of education-job match is estimated.

To assess whether there is effectively a selection process we look at the parameter ρ , which measures the correlation between the error terms of the two equations: when ρ is significantly different from zero then the Heckman selection model is appropriate, which in fact is the case for three out of the four models reported in Table 2.

The models are estimated separately for each macro-region (North, Centre, and South) of employment of the graduate, and for Italy as a whole and, in line with the literature, comprise the following variables⁷:

Outcome equation:

$$\text{Edu-job match} = f(\text{MIGR-BY-ORIGIN, FIELD, ATTITUDE, JOB, GRADE}) \quad (1)$$

Selection equation:

$$\text{Employment} = f(\text{MIGR, FIELD, PERSONAL, CURREDU}) \quad (2)$$

In the outcome equation (1), where the dependent variable is the ordered variable introduced in the previous section, education-job (mis)match (with the lowest level, Objective overeducation, as a base category),⁸ the following explanatory variables are included:

⁷ We are aware that our specification raises two issues: the long debated one of endogeneity between migration and employment (i.e. do people follow jobs or do jobs follow people?), and the less debated one on the endogeneity between migration and education-job match. In both cases the debate has proven inconclusive (see Hoogstra, van Dijk and Florax (2011) on the former point; and Jauhiainen (2011); Devillanova (2011); and Croce and Ghignoni (2011) on the second). Given also the characteristics of our sample, we preferred to assume migration as endogenous and avoid the use of instruments.

⁸ As mentioned above, we also run the model by applying probit estimations with self-selection (see Tables 3a and 3b). In this case, in the outcome equation the dependent is a binary variable based either on the question “Was the degree formally required?” (Yes=matched qualification; No=overqualification); or on the question “Was the degree effectively necessary to do the job?” (Yes=full skill utilisation; No=skill underutilisation).

MIGR is a dummy variable identifying mobility behaviour (the *non migrants* represent the base category in the regressions). The variable has also been split according to the macro-region of origin of the migrant graduate.

FIELD captures the broad field of study and includes three groups:

- **Humanities** (base category)
- **Social Sciences** (Economics and statistics, Social and political sciences and Law)
- **Hard & Technical Sciences** (Sciences, Engineering and Architecture)

ATTITUDE is a vector of variables that capture the graduates' attitude towards their field of studies. They are proxies for personal characteristics which may influence the resilience and ability to look for a job in a specific professional career. It includes:

Interest: a dummy variable that identifies those graduates who chose their degree because they were interested in the topic.

Job prospects: a dummy variable that identifies those graduates who chose their degree because of the job prospects it offered.

JOB is a vector of job-specific characteristics and includes:⁹

Salary: monthly salary of graduates expressed in euros.

Self_emp: a dummy variable that identifies graduates who are self-employed.

Seniority: years during which the graduate has been in the job. As we exclude those graduates who started working before finishing the degree (very few, though), the variable ranges from zero to three years.

Prev_jobexp: a dummy variables that identifies graduates that have had job experience before the current employment.

GRADE: graduation mark of the graduate expressed in numbers.

In the selection equation (2), where the dependent variable is whether the graduate is employed or not, we have the following explanatory variables:

MIGR: dummy variable identifying mobility behaviour, as in the outcome equation.

FIELD: as in the outcome equation.

PERSONAL is a vector of variables capturing personal characteristics of graduates and includes:

Age: age of the graduate expressed in years.

Female: a dummy variable that identifies female graduates.

⁹ In our analysis graduates who are in seasonal employment are excluded as well as graduates who started their current job before the end of their degree, as the *Indagine* does not provide information on their education-job match.

Par_uni: a dummy variable that captures the social background of the graduate by identifying whether she/he has at least one parent with university education.

CURREDU is a vector of variables capturing those graduates currently engaged in further education, and includes:

PhD: the graduate is currently enrolled in a PhD programme

Training: the graduate is currently enrolled in a training/internship

Otheredu: the graduate is currently enrolled in other qualifications/courses

4. Results

We run the ordered models with sample selection for the three macro-regions of destination as well as for the whole sample. As the rho is not significant for the South model, simple OLS estimates are reported. Table 2 shows the results for the outcome and selection equations.

[Table 2 about here]

Starting from the selection equation (bottom part of Table 2), whilst in Italy and in the regions of the Centre interregional migration definitely increases the chances of the graduate to be employed, for the North this effect is not verified: the coefficient is still positive, but far from being significant. On the one hand, these results confirm the overall positive effect of migration on employment outcomes in the Italian case, on the other they point out that regional specificities cannot be ignored: in the Northern regions, where different opportunities – particularly in the private business sector – are more abundant, being a migrant or a local graduate does not impact on job opportunities, as the latter are likely to be driven to a larger extent by competencies and skills.

The educational background in Social Sciences seems to decrease the probability of being employed, although the coefficient is very small and non-significant for the Central regions: this may be partially due to the overwhelming weight of Lazio in the Centre, with a strong demand for social science backgrounds requested in the large public administration sector. On the contrary, the positive and significant influence of scientific and technical degrees (always with respect to Humanities) on the probability of being employed – verified in the case of the Centre and the country as a whole – turns out to be largely ineffective in the Northern regions.

The coefficients of personal characteristics are mixed: whilst age does not have any impact on the employability of the graduate – not surprisingly, given the relative homogeneity of our sample of new entrants in the labour market after graduation –, female graduates, as expected and in line with previous empirical results, are less likely to be employed independently of geography. Graduates whose parents have a university degree are less likely to be employed particularly in the Northern part of the country (*Par_uni* is negative and significant at 1%); Consistently, the controls for those graduates who are currently engaged in further education are negative and significant in all cases.

Looking at the outcome equation (top of Table 2), the effect of migration on job-education (mis)matching – which is the main focus of our study – presents some interesting differences with respect to the geography of destination (work) and origin (study) of the graduates

employed.¹⁰ Indeed, interregional migration increases the probability of having a better education-job matching in Italy, but this result is driven by the North as the employment location; the coefficients are in fact never significant for the Centre and South specifications. Moreover, the positive effect of being a migrant holds only for graduates migrating from the South and, to a lesser extent, from the same Northern area. In other words, the results suggest that migrant graduates to the North from the relatively backward Mezzogiorno after attending university there do find a better matching than those who stayed and found a job in the study region.

The educational background is a critical determinant of education-job match: in line with previous studies, those with a background in hard and technical sciences enjoy a much better match overall, irrespective of the employment location. At the same time, and once more, territorial specificities clearly arise with respect to social scientists: worse overeducation conditions than those with a background in humanities (the base category) seem to pertain particularly workers employed in the Mezzogiorno, whilst in the Central area this outcome is reversed (the coefficient is positive and, although weakly, significant). This again might be explained by the “capital region effect” and the well known absorption capacity of the public administration sector towards social science university degrees.

Interestingly, graduates attitudes in choosing their degree also matter in determining the education-job matching. Those who chose a specific course of study because of the career prospects it offered or out of personal interest are more likely to experience a favourable matching in all regions but in the South as an employment location.

Looking at job-characteristics, the regression results are generally in line with the results of previous studies. Those who are self-employed are, across all geographical areas, more likely to have a good education-job matching. This finding warrants further investigation as it suggests that self-employment may be a necessary choice to open up a career in certain fields. Salary is positively associated with the higher education-job matches, but the coefficient is significant for graduates employed in the North. Contrary to other studies (e.g. Boudarbat and Chernoff, 2010), instead, education-job mismatches seem not to be affected by seniority in the current employment position (but in the Northern regions, where the effect is negative and weak): this might be due again to the relative homogeneity of our sample, that considers new entrants in the labour market (after three years of graduation). Graduates with previous work experience do not turn out to have a better matching in their current employment: the coefficient of the variable `Prev_jobexp` is always negative and significant, across all geographical areas.

Finally, as expected, the performance at university, that is the grade of graduation, increases the probability of education-job matching.

These results – and particularly the relationship between migration and education-job matching – are largely consistent with those obtained by the probit estimations with Heckman selection, which are reported in Tables 3a and 3b. The coefficient of migration on job-education matching – positive and significant only for graduates migrating from the Southern regions to the North to be employed there – can be interpreted in the view of use of competencies and skills (Table 3a) and overqualification (Table 3b): the effect of migration

¹⁰ The variable `MIGR` was also included in the models without the splitting by area of origin, and by excluding the returners from the non-migrants aggregate: given the consistency of the results (sign and level of significance do not change), the presentation of migrants versus all those classified as non-migrants and by macro-region of origin seemed to be the most informative.

seems indeed stronger on the full utilization of skills than on achieving just a matched qualification.

[Tables 3a and 3b about here]

5. Conclusions

The aim of this paper was to offer a place-based perspective on the determinants of education-job (mis)matching in the Italian case, and to test empirically whether and where interregional migration has an impact on such matching in the early stage of the graduate's professional career. Our results suggest that while interregional migration seems to allow a better match at the level of the whole country, striking differences emerge when looking at the subnational dimension. In particular, interregional migration increases the likelihood of having a good education-job matching – and particularly a full utilisation of the skills acquired during the university study – only if the graduates are employed in a Northern region, and particularly if they migrate after obtaining their degree in a region of the South; a positive, but much weaker, effect is found also for North-to-North migrants. Such a positive effect of Southern migration to the North is also confirmed when looking separately at the indicators of use of competencies/skills and formal qualification (probit estimates).

These results provide some interesting hints on the regional specificities of the interaction between local demand and local supply of graduates. First of all, whilst in the North – where the most dynamic regional economic and innovation systems are located – migration increases the likelihood of education-job matching, this is not the case of the other areas of the country, and particularly the Centre, in spite of the weight of the capital region in terms of employment in the public sector, structurally associated with a lower level of overeducation (Devillanova, 2011). Being a migrant increases the probability of being employed in both the Central and Mezzogiorno regions, but does not ensure that graduates are employed in jobs for which they were actually trained during their degree. Conversely, whilst the North does not provide better job opportunities to migrants with respect to the local graduates, the inflows of human capital from other regions – and particularly from those coming from the more peripheral and disadvantaged Southern regions – seem to find a better fit between their own competences and the highly diverse economic structure of the regional system.

In the traditional role of 'vector of regional convergence' assigned to labour mobility by classical economics, the North is likely, once again, to emerge as a net winner: not only it gains from public investment in higher education made in other regions of the country, but it is also able to ensure a more productive use of such an investment than other areas. Regional convergence, once more, does not look like a natural outcome of spontaneous processes in the Italian case. In addition, the regions under scrutiny seem to experience some differentiated patterns also with respect to the education backgrounds demanded by employers and offered by the graduates. While hard and technical science graduates incontrovertibly tend to have significantly better education-job matches, indicating a shortage of such specialisations, social scientists seem to experience a much worst underutilisation of their competencies, but in the case of the Centre (though the effect is weakly significant), possibly due to the wide use of these backgrounds in the public sector.

Following Devillanova (2011), we therefore conclude that the positive effect of spatial mobility on education-job matching needs further qualification, particularly by assuming geographically-specific research perspectives. This should have critical implications for public policy aimed at closing the gap between the demand and the supply of university

graduates' competences and skills at both national and regional level. A careful evaluation of skills and competences provided by regional universities in relation to those needed and demanded by local economic structures is essential for retaining human capital and maximising the returns to both public and private investment carried out in the region, particularly in the more peripheral areas. Regionally-based policy design is fundamental to try to invert the self-reinforcing mechanism at work: some re-thinking of the future directions for forming the competences and skills (not necessarily only at the university level) required by constantly evolving labour markets is needed, even more as the overall Italian specialisation model has not proved to be strongly resilient to the rising competition from global markets. For retaining human capital and maximising public and private investment in education what is needed is a fruitful combination of, on the one hand, accurate and updated information on projections of the demand for skills and professional profiles to be spread possibly at the school level; and, on the other, support for training-on-the-job programmes – also achievable with private-public partnerships – for updating, upgrading and reconversion of skills and competencies of the employees, both experienced and, even more, new entrants. This is going to be effective if, and only if, carried out on the basis of a sound and detailed knowledge of the regional economic and social structure and its dynamic over time, trying to build on the existing strengths and gradually moving towards related but more promising activities.

We have used and adapted an indicator borrowed from the literature and well grounded in the theory, that can thus be applied also in further analysis on the distinction between qualification and skill utilisation: one line of future research in this direction is to go more in depth into the issue of horizontal versus vertical education-job mismatching. This can definitely help to shed light on the role of generic competences which have recently caught much scholarly and policy attention (Corominas et al., 2010). A second line of enquiry would be to extend the analysis to other national cases, in order to obtain further feedbacks on the regional specificities of the relationship here studied and disentangle the complexity and variety of regional development paths.

References

- Barca, F. (2006) *Italia Frenata, Paradossi e Lezioni della Politica per lo Sviluppo*. Rome, Donzelli.
- Basker, E. (2002) Education, job search and migration, University of Missouri-Columbia Working Paper No. 02-16.
- Battu, H., Belfield, C. and Sloane, P. (2000) How well can we measure graduate overeducation and its effects?, *National Institute Economic Review*, 171: 82–93.
- Biggeri, L., Bini, M. & Grilli, L. (2001) The Transition from University to Work: a Multilevel Approach to the Analysis of the Time to Obtain the First Job, *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 164, 2, 293-305.
- Borra, C., Gómez-García, F. & Salas-Velasco, M. (2009) Entry of Young Economists into Working Life: Analysis of the Determinants of First Unemployment Duration, *Applied Economics Letters*, 16, 1483–1488
- Boudarbat, B. and Chernoff, V. (2010) The determinants of education-job match among Canadian university graduates, Scientific Series, Ciranos Working Paper 14-2010.
- Boudarbat, B. and Montmarquette, C. (2009) Choice of Fields of Study of University Canadian Graduates: the Role of Gender and their Parents' Education, *Education Economics*, 17, 2, 185 - 213.

- Büchel, F., & van Ham, M. (2003) Overeducation, Regional Labor Markets and Spatial Flexibility, *Journal of Urban Economics*, 53(3), 482-493.
- Chevalier, A. (2003) Measuring overeducation, *Economica*, 70: 509–531.
- Chiswick, B. R. and Miller, P. W (2009) The international transferability of immigrants' human capital, *The Economics of Education Review*, 28: 162–169.
- Corominas, E. Saurina, C. & Villar, E. (2010) The Match Between University Education And Graduate Labour Market Outcomes (Education-Job Match) *An analysis of three graduate cohorts in Catalonia*, Barcelona: Agència per a la Qualitat del Sistema Universitari de Catalunya.
- Croce, G. and Ghignoni, E. (2011) Overeducation and spatial flexibility in Italian local labour markets, MPRA working paper no. 29670, October 2011.
- D'Antonio, M. & Scarlato, M. (2007) *I Laureati del Mezzogiorno: una Risorsa Sottoutilizzata o Dispersa*. Quaderni SVIMEZ, SVIMEZ, Roma.
- Dekker, R., de Grip, A. and Heijke, H. (2002) The Effects of Training and Overeducation on Career Mobility In A Segmented Labour Market, *International Journal of Manpower*, 23, 2, 106-125.
- Devillanova, C. (2011) Overeducation and spatial flexibility: New evidence from Italian survey data, Università Commerciale Luigi Bocconi, Centre for Research on the Public Sector, Working Paper n. 159.
- Di Liberto, A. (2007) Education and Italian Regional Development, *Economics of Education Review*, 27 (1), 94-107.
- Di Pietro, G. and Urwin, P. (2006) Education and Skills Mismatch in the Italian Graduate Labour Market”, *Applied Economics*, 38, 1, 79-93.
- Dolton, P.J. and Silles, M.A. (2008) The effects of overeducation on earnings in the graduate labour market, *Economics of Education Review*, 27: 125–139.
- Dotti, N.F., Fratesi, U., Lenzi, C. And Percoco, M. (2012) Local labour markets and the interregional mobility of Italian university students, Working Paper, BEST, Politecnico di Milano.
- European Commission (2009) *New Skills for New Jobs: Anticipating and Matching Labour Market and Skills Needs*. DG Employment, Social Affairs and Equal Opportunities, and DG Education and Culture, Office for Official Publications of the European Communities, Luxembourg.
- Faggian, A. and McCann, P. (2006) Human capital flows and regional knowledge assets: a simultaneous equation approach, *Oxford Economic Papers*, 58(3), 475-500.
- Freeman, R.B. (1976) *The Overeducated American*, New York: Academic Press.
- García-Espejo, I. & Ibáñez, M. (2006), Educational-Skill Matches and Labour Achievements among Graduates in Spain, *European Sociological Review*, 22, 2, 141-156.
- Green, F. and McIntosh, S. (2007) Is there a genuine under-utilization of skills amongst the over-qualified? *Applied Economics*, 39(4), 427-439.
- Green, F. and Zhu Y. (2010) Overqualification, job dissatisfaction, and increasing dispersion in the returns to graduate education, *Oxford Economic Papers*, 62: 740–763.
- Greene, W. H. & Hensher, D.A. (2010) *Modelling Ordered Choices*, Cambridge MA, Cambridge University Press.
- Groot, W. and Maassen van den Brink, H. (2000) Overeducation in the Labor Market: A Meta-Analysis, *Economics of Education Review*, 19, 149-158.
- Hartog, J. (2000) Mismatch and Earnings: Where Are We, Where Should We go, *Economics of Education Review* 19, 131-147.

- Healy, A. and Morgan, K. (2009), Spaces of Innovation: learning, proximity and the ecological turn, Utrecht University, Papers in Evolutionary Economic Geography (PEEG), No. 0918.
- Heijke, H., Meng, C. and Ris, C. (2003) Fitting to the job: the role of generic and vocational competencies in adjustment and performance, *Labour Economics*, 10, 215-229.
- 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.
- Hoogstra, van Dijk and Florax (2011) Determinants of Variation in Population–Employment Interaction Findings: A Quasi-Experimental Meta-Analysis, *Geographical Analysis*, 43(1), 4–37.
- Iammarino, S & Marinelli, E. (2011) Is the Grass Greener on the Other Side of the Fence? Graduate Mobility and Job Satisfaction in Italy, *Environment and Planning A*, 43, 2761 ^ 2777.
- Iammarino, S. (2005) An evolutionary integrated view of regional systems of innovation. Concepts, measures and historical perspectives, *European Planning Studies*, 13, 4, 495-517.
- ISTAT (2010) *Indagine Campionaria sull'Inserimento Professionale dei Laureati*. ISTAT, Rome.
- Jauhiainen, S. (2011) Overeducation in the Finnish regional labour markets, *Papers in Regional Science*, 90(3), 578-588.
- Krahn, H. & Bowlby, J. (1999) Education job-skills match: An Analysis of the 1990 and 1995 National Graduates Surveys, A Human Resources Development Canada Research paper, in collaboration with the Centre for Education Statistics.
- Marinelli, E. (2011) *Graduates on the Move: Knowledge Flows and Italian Regional Disparities. Migration Patterns of 2001 Graduates*, PhD thesis, London School of Economics and Political Sciences.
- Marinelli, E. (2012) Graduate migration and innovation in the Italian regions, forthcoming on *Regional Studies*.
- Mauro, L. and Podrecca, E. (1994) The case of Italian regions: convergence or dualism? *Economic Notes*, 24(2): 447–72.
- McGuinness, S. (2006) Overeducation in the Labour Market, *Journal of Economic Surveys* 20, 3, 387-418.
- Miranda A. and Rabe-Hesketh S. (2006) *Maximum likelihood estimation of endogenous switching and sample selection models for binary, ordinal, and count variables*, *Stata Journal*, 6: 3.
- Nelson, R. R. & Phelps, E. S. (1965) Investments in Humans, Technology Diffusion and Economic Growth, *The American Economic Review*, 56.
- Paci, R. and Pigliaru, F. (1997) Structural change and convergence: an Italian regional perspective, *Structural Change and Economic Dynamics*, 8(3), 297–318.
- Piras, R. (2005) Il Contenuto di Capitale Umano dei Flussi Migratori Interregionali: 1980-2002. *Politica Economica*, 21, 461-491.
- Piras, R. (2006) I Movimenti Migratori Interregional per Titolo di Studio: una Stima dei Tassi Migratori ed un'Analisi dei Flussi. *Studi di Emigrazione*, 43, 153-170.
- Quinn, M. A. & Rubb, S. (2005) The Importance of Education-Occupation Matching in Migration Decisions. *Demography*, 42, 1, 153-167.
- Quintano, C., Castellano, R. & D'Agostino, A. (2008) Graduates in Economics and educational Mismatch: the Case Study of the University of Naples 'Parthenope', *Journal of Education and Work*, 21, 3, 249-271.

- Ramos, R. and Sanromà, E. (2011) Overeducation and Local Labour Markets in Spain, IZA DP No. 6028, October 2011.
- Redpath, L. (1994) Education-Job Mismatch Among Canadian University Graduates: Implications for Employers and Educators, *Canadian Journal of Higher Education*, 24, 89-114.
- Robst, J. (2007) Education and Job Match: The Relatedness of College Major and Work, *Economics of Education Review*, 26, 397-407.
- Rodriguez-Pose, A. and Tselios, V. (2010) Returns to migration, education and externalities in the European Union, *Papers in Regional Science*, 89(2), 411-434.
- Rosen, S. (1972) Learning and experience in the labour market, *Journal of Human Resources*, 7(3), 326-42.
- Rumberger, R.W. (1981) Overeducation in the US labour market, New York: Praeger Publishers.
- Sala, G., Planas, J.; Masjuan, J. M. & Enciso, P. (2007) El Fenomen de la Transició Laboral. In Serra Ramoneda, A. (ed.) *Educació superior i treball a Catalunya: anàlisi dels factors d'inserció laboral*. Barcelona: Agència per a la Qualitat del Sistema Universitari de Catalunya, 9-37.
- Salter, A. J. & Martin, B.R. (2001) The economic benefits of publicly funded basic research: a critical review, *Research Policy*, 30, 509 – 532.
- Senker, J. and Senker, P. (1995) How the Teaching Company Scheme helps Companies, *Management Research News*, 18, 6/7,1-8.
- Smimez (2009) Rapporto sull'economia del Mezzogiorno 2008, Bologna, Il Mulino.
- Ungaro, P. & Verzicco, L. (2005) *Misura e Analisi del Rendimento dei Titoli di Studio Superiori nella Fase di Primo Inserimento nel Mondo del Lavoro*, Paper presented at the XX Convegno Nazionale di Economia del Lavoro. Rome, 22-23 September.
- van der Klaauw, B. & A. van Vuuren (2010) Job Search and Academic Achievement, *European Economic Review*, 54, 294-316.
- van Ham, M. (2001) Workplace Mobility and Occupational Achievement, *International Journal of Population Geography*, 7, 4, 295-306.
- Vandenbussche, J., Aghion, P. & Meghir, C. (2006) Growth, Distance to Frontier and Composition of Human Capital, *Journal of Economic Growth*, 11, 97-127.
- Venhorst, V.A. & Cörvers, F. (2011) *Entry into working life: spatial mobility and job match quality of higher educated graduates*, Faculty of Spatial Science, University of Groningen, Mimeo.
- Verhaest, D. & Omey, E. (2006) The Impact of Overeducation and its Measurement, *Social Indicators Research*, 77, 3, 419-448.
- Viesti, G. (2003) *Abolire il Mezzogiorno*, Bari, Laterza.
- von Tunzelmann, N. (2009) Regional Capabilities and Industrial Regeneration, in Farshchi, M., Janne, O. and McCann, P. (Eds), *Technological Change and Mature Industrial Regions: Firms, Knowledge and Policy*, Edward Elgar, Cheltenham, pp.11-28.
- Walters, D. (2004) The Relationship Between Postsecondary Education and Skill: Comparing Credentialism with Human Capital Theory, *The Canadian Journal of Higher Education*, 34, 2, 97-124.
- Wolbers, M.H.J. (2003) Job Mismatches and their Labour-Market Effects among School-Leavers in Europe, *European Sociological Review*, 19, 3, pp. 249-266.

Table 1. Education job-matching by mobility category (%)

Education-job (mis)matching in Italy	Non migrants (Stayers + Returners)	Migrants from the North	Migrants from the Centre	Migrants from the South	Total
Objective overeducation	20.57	19.27	19.2	16.65	20.06
Subjective overeducation	10.81	10.45	9.71	9.15	10.59
Subjective match	11.05	9.64	10.57	11.98	10.99
Objective match	57.57	60.64	60.51	62.21	58.36
Total	100	100	100	100	100

Note: the Table refers to employed graduates

Table 2. Ordered logit with Heckman selection*

	Macro-region of destination			
	North	Centre	South	Italy
Outcome equation – Education-job (mis)matching (4 levels)				
Migr_from_North	0.113*	0.160	-0.109	0.120**
	(1.71)	(1.13)	(-0.38)	(2.29)
Migr_from_Centre	0.164	0.113	-0.0382	0.113
	(1.26)	(0.89)	(-0.19)	(1.55)
Migr_from_South	0.348***	0.0714	0.00631	0.179***
	(4.68)	(0.63)	(0.03)	(3.27)
Social Sciences	-0.0674	0.175*	-0.538***	-0.0774*
	(-1.05)	(1.69)	(-3.46)	(-1.69)
Hard & Technical Sciences	0.505***	0.779***	0.596***	0.545***
	(7.65)	(8.02)	(3.76)	(11.26)
Interest	0.157***	0.264***	0.240	0.161***
	(2.63)	(2.71)	(1.56)	(3.68)
Job_prosp	0.207***	0.308***	-0.0508	0.171***
	(3.75)	(3.41)	(-0.37)	(4.31)
Salary	0.000137***	0.0000980	0.000155	0.000133***
	(2.78)	(1.48)	(1.42)	(4.16)
Self_emp	0.417***	0.399***	0.827***	0.408***
	(6.79)	(4.70)	(5.50)	(9.59)
Seniority	-0.0533**	0.0455	0.0127	-0.0184
	(-2.37)	(1.34)	(0.24)	(-1.17)
Previous_jobexp	-0.106**	-0.154**	-0.339***	-0.137***
	(-2.29)	(-1.97)	(-3.06)	(-4.21)
Grade	0.00913***	0.0129***	0.0219***	0.0113***
	(4.31)	(3.78)	(3.62)	(7.32)
Selection equation – Employment				
Migr	0.0423	0.260***		0.268***
	(0.68)	(3.00)		(6.57)
Social Sciences	-0.339***	-0.0463		-0.259***
	(-5.11)	(-0.31)		(-5.03)
Hard Sciences	0.0588	0.448***		0.313***
	(0.81)	(3.00)		(5.87)
Par_uni	-0.177***	-0.0659		-0.0760*
	(-2.78)	(-0.62)		(-1.71)
Age	-0.00709	0.0107		-0.00921
	(-0.74)	(0.51)		(-1.23)
Female	-0.206***	-0.160**		-0.213***
	(-4.10)	(-2.23)		(-6.61)
PhD	-1.709***	-1.450***		-1.559***
	(-16.28)	(-10.25)		(-22.05)
Training	-0.855***	-0.994***		-0.852***
	(-8.81)	(-7.49)		(-14.31)
Otheredu	-0.776***	-0.655***		-0.648***
	(-11.03)	(-4.89)		(-12.28)

_cons	1.743***	0.529		1.256***
	(6.29)	(0.90)		(5.97)
	Auxiliary parameters			
_cut1	0.605**	1.526***	1.030	0.892***
	(2.56)	(3.95)	(1.51)	(5.02)
_cut2	0.976***	1.884***	1.621**	1.246***
	(4.13)	(4.87)	(2.37)	(7.02)
_cut3	1.263***	2.218***	2.208***	1.550***
	(5.33)	(5.69)	(3.22)	(8.70)
load				
_cons	1.311***	2.397**		0.942***
	(4.22)	(2.24)		(3.57)
rho	0.41***	.56***		0.33***
	(6.43)	(6.14)		(4.53)
N	12095	5935	2736	26570

Note: Simple Ologit is reported for the South model

Table 3a. Probit with Heckman selection*

Dependent variable: is the degree necessary to do the job?

	Macro-region of destination		
DEGREE_NEC	North	Centre	South
	Outcome equation		
Migr_from_North	0.112 (1.37)	0.207 (1.28)	-0.0322 (-0.16)
Migr_from_Centre	0.148 (1.06)	0.137 (0.90)	0.00325 (0.02)
Migr_from_South	0.540*** (5.60)	0.128 (1.05)	-0.0490 (-0.31)
Social Sciences	-0.140* (-1.81)	0.188 (1.60)	-0.316*** (-3.10)
Hard Sciences	0.321*** (3.83)	0.757*** (6.09)	0.209** (2.01)
Interest	0.208*** (2.77)	0.201* (1.88)	0.180* (1.83)
Job_prosp	0.188*** (2.77)	0.247*** (2.59)	0.00387 (0.04)
Salary	0.0000881 (1.53)	0.0000534 (0.68)	0.0000173 (0.26)
Self_emp	0.549*** (7.41)	0.465*** (4.52)	0.486*** (5.06)
Seniority	-0.0426 (-1.55)	0.0605 (1.57)	0.00719 (0.21)
Previous_jobexp	-0.107* (-1.86)	-0.198** (-2.51)	-0.190** (-2.56)
Grade	0.00794***	0.00634 (1.45)	0.0133*** (3.49)
_cons	-0.793*** (-2.76)	-1.270*** (-2.58)	-0.913** (-2.14)
	Selection equation		
Migr	0.0487 (0.78)	0.271*** (3.01)	
Social Sciences	-0.225*** (-3.18)	0.126 (0.83)	
Hard Sciences	0.291*** (3.72)	0.744*** (4.98)	
Par_uni	-0.184*** (-2.76)	-0.161* (-1.70)	
Age	-0.0454*** (-3.89)	-0.0262 (-1.18)	
Female	-0.195*** (-3.67)	-0.137* (-1.86)	
PhD	-2.047*** (-16.94)	-1.662*** (-10.51)	
Training	-0.810***	-1.124***	

	(-7.58)	(-6.80)	
Otheredu	-1.010***	-0.705***	
	(-12.97)	(-4.95)	
_cons	2.507***	1.183*	
	(7.60)	(1.85)	
rho	0.329**	0.793***	
	(2.28)	(3.55)	
N	6949	3519	2736

Note: Simple Probit without controlling for selection bias is reported for the South model

Table 3b. Probit with Heckman selection*

Dependent variable: is the degree required for the job?

	Macro-region of destination		
DEGREE_REQ	North	Centre	South
	Outcome equation		
Migr_from_North	0.0806 (1.00)	0.0483 (0.29)	-0.0940 (-0.49)
Migr_from_Centre	0.0954 (0.63)	-0.00557 (-0.04)	0.00788 (0.04)
Migr_from_South	0.186* (1.83)	0.0548 (0.42)	0.126 (0.82)
Social Sciences	0.0558 (0.73)	0.306*** (2.61)	-0.296*** (-2.88)
Hard Sciences	0.630*** (7.68)	0.847*** (6.09)	0.552*** (5.25)
Interest	0.142* (1.83)	0.269** (2.33)	0.0473 (0.44)
Job_prosp	0.268*** (3.87)	0.281*** (2.75)	-0.0508 (-0.52)
Salary	0.000164** * (2.85)	0.000220** (2.43)	0.000182** (2.49)
Self_emp	0.287*** (4.01)	0.333*** (3.23)	0.363*** (3.91)
Seniority	-0.0428 (-1.54)	0.0397 (0.91)	0.0144 (0.39)
Previous_jobexp	-0.0615 (-1.05)	-0.125 (-1.46)	-0.145* (-1.88)
Grade	0.0106*** (4.05)	0.0191*** (4.23)	0.0105*** (2.69)
_cons	-1.198*** (-4.05)	-2.813*** (-5.75)	-0.851* (-1.96)
	Selection equation		
Migr	0.0457 (0.73)	0.277*** (3.04)	
Social Sciences	-0.232*** (-3.29)	0.123 (0.80)	
Hard Sciences	0.287*** (3.65)	0.734*** (4.82)	
Par_uni	-0.202*** (-3.03)	-0.171* (-1.77)	
Age	-0.0461*** (-3.94)	-0.0227 (-0.87)	
Female	-0.197*** (-3.75)	-0.143* (-1.91)	
PhD	-2.029*** (-16.70)	-1.675*** (-10.59)	
Training	-0.779***	-1.103***	

	(-7.13)	(-6.39)	
Otheredu	-1.027***	-0.706***	
	(-13.34)	(-4.80)	
_cons	2.534***	1.096	
	(7.75)	(1.48)	
rho	0.274*	0.555*	
	(1.84)	(1.87)	
N	6951	3519	2737

Note: Simple Probit without controlling for selection bias is reported for the South model

Table A1. The matrix of graduate migration by macro-region (%)

Macro-region of Origin	Macro-region of Destination			Total
	North	Centre	South	
North	7,523	2,376	1,548	11,446
	65.7	20.8	13.5	100
	27.9	18.5	10.9	21.2
Centre	3,027	1,613	2,109	6,749
	44.9	23.9	31.3	100
	11.2	12.6	14.9	12.5
South	16,467	8,826	10,532	35,825
	46.0	24.6	29.4	100
	61.0	68.9	74.2	66.3
Total	27,016	12,816	14,189	54,020
	50.0	23.7	26.3	100
	100	100	100	100

Notes: absolute numbers are weighted to expand them to the universe in order to calculate shares. How to read the table: e.g. of all graduate migrants from a Northern region, 65.7% moved to another region in the North, 20.8% to a Central region and 13.5% to a South; of all graduate migrants currently working in the North, 27.9% come from another Northern region, 11.2% from a Central region and 61% from a region in the South.