Graduate migration in Italy - Lifestyle or necessity?

Elisabetta Marinelli* **
*JRC-IPTS Institute of Perspective Technological Studies
**LSE-London School of Economics & Political Sciences

Address for correspondence:
Elisabetta Marinelli

Email: Elisabetta.Marinelli@ec.europa.eu

Institute for Prospective Technological Studies, Knowledge for Growth Unit (KfG)
ERA Policy Mixes, Joint Programming and Foresight Action
European Commission – DG JRC
Edificio Expo WTC,
C/ Inca Garcilaso 3, E-41092 SEVILLA

Graduate migration in Italy - Lifestyle or necessity?

Elisabetta Marinelli* **
*JRC-IPTS Institute of Perspective Technological Studies
**LSE-London School of Economics & Political Sciences

Abstract
This paper studies the destination choice of Italian mobile graduates, tackling three aspects. First it takes into account simultaneously the structural drivers of migration and the social structures that underpin it (i.e migration networks). Secondly, it compares the preferences of migrants across Italy to those moving from the least developed South to the Centre-North, and those moving within the Centre-North. Thirdly, it pays special attention to those migrants applying, in their jobs, the skills gained in their degree, as they effectively transferring university knowledge to the labour market. Results indicate that graduates from different areas have very different spatial preferences, yet they all rely strongly on social networks.

***Key words*: graduate spatial mobility, migration networks, Italian regions.**
***JEL classification*: R23, J24, O3**

1. Introduction

Italy is characterised by large sub-national disparities between the less developed South (or Mezzogiorno) and the more developed Centre-North (e.g. Viesti, 2003; Barca, 2006), which are, unsurprisingly, mirrored in its complex history of internal population flows (e.g. Attanasio and Padoa Schioppa, 1991). This paper focuses on a new trend in the dynamics of internal population flows: whilst historically unskilled workers constituted the bulk of Italian migrants, leaving the South for the Centre-North, in recent years, the high skilled have become increasingly mobile, with the Mezzogiorno experiencing a proper *brain-drain* to the Centre-North (Piras, 2005, 2006). As the high skilled are a crucial input to both innovative activity and economic growth, their spatial movements can potentially affect the dynamics of local development and as such, deserve thorough investigation.

This paper focuses on a sub-sample of the highly skilled: recent university graduates. They are especially interesting to analyse: in their transition between study and employment,

graduates are a highly mobile segment of the society with the potential to transfer recent academic knowledge in the labour market (e.g. Faggian and McCann, 2006, 2009; Gottlieb and Joseph, 2006)

In particular, this study explains how mobile graduates, in Italy, chose their region of destination offering important theoretical and empirical insights. At the theoretical level, the paper simultaneously explores theories of migration rooted in the economic and sociological traditions, pinning down the complementarity of the two. Specifically, it analyses the different (macro-level) regional characteristics that attract talent and the role of (meso-level) migration networks in shaping population flows. At the empirical level, to fully understand the Italian internal *brain drain*, the study first looks at the behaviour of migrants across the whole country and, secondly, isolates the graduates moving from the South to the Centre-North and those moving within the Centre-North. This allows assessing whether those coming from different parts of the country share similar motivations. Finally, to gain insights on the process of knowledge transfer between the university and the labour market, the paper pays particular attention to those graduates who, in their jobs, apply directly the skills gained at university. These aspects are studied through conditional logit (CL) models, which are applied to the survey *Indagine sull'Inserimento Professionale dei Laureati* ISTAT (2007). The survey is run by the Italian Statistical Institute, and covers the 2001 cohort of graduates, three years after the end of their degree.

The paper is organised as follows. Section 2 reviews the different approaches to migration, which have highlighted its individual or social nature. Section 3 summarises the trends in graduate migration in Italy, contextualising the present work and defining its research objectives. Section 4 describes the methodology, covering the dataset, the econometric

technique used and the specification. Section 5 reports the empirical analysis. Section 6 concludes by summarising the results and identifying some policy implications.

2. Migration: individual or social process?

Different streams of research have explored the spatial features that drive population movements. *Gravity models*, for instance, posit that population flows are determined by the size of and the distance between the areas of origin and destination: much like in Newtonian physics, movements are stronger among close areas, flow from smaller to the larger regions. Mainstream economic theory (Sjaastad, 1962), on the other hand, has highlighted that migrants move from poorer to more economically buoyant areas. This approach, although capturing a key element of the phenomenon, has been broadened to include factors that are specifically relevant to the highly skilled. Many scholars, indeed, have pointed out that highly educated individuals, including young graduates, look for quality of life and cultural amenities when choosing where to live (i.e. Cebula, 2005; Di Pietro, 2005; van Dalen and Henken, 2007) and tend to concentrate in highly innovative areas (e.g. Ritsila and Ovaskainen, 2001; Giannetti, 2001, 2003; Florida, 2002a, 2002b; Pekkala, 2003; Faggian and McCann 2006, 2009; Rutten and Gelissen, 2008). Implicit in these approaches is the assumption that migration is an individual process, whereby the choice to relocate is based on the characteristics of the areas of origin and destination. The approach posits that collective migration patterns emerge from the sum of individual decision-making processes based on utility maximisation.

Such a view has been criticised for being unrealistic and the sociology of migration has repeatedly stressed that migration is a collective phenomenon as it relies on social networks which facilitate, support and reinforce the process of relocation, reducing its intrinsic costs

and risks (e.g. Portes and Back, 1985; Massey, 1990; Goss and Lindquist, 1995; Guilmoto and Sandron, 2001; Haug 2008).[1] Moreover, it has been pointed out that networks differ both in nature and in the specific function they carry out: for instance they maybe family based (Boyd, 1989), or nationality/community based (Portes *et al.*, 1999), they may facilitate migration in general terms, or more formally organise employment and encourage business activity (Rindoks *et al*., 2006). As for networks of graduates, scholars have recognised that they are key in setting the future path of skilled labour circulation (Vertovec, 2002).

It is argued here, in line with Haug (2008), that the two approaches to migration, are complementary rather than alternative. Indeed, whilst the macro-view of migration can give insights on the structural features that drive population flows, the meso-view explains the actual mechanisms that sustain it. Combining the two perspectives, therefore, gives a more precise representation of the phenomenon, as such, serves as a sounder base for policy design.

3. High-skilled mobility in Italy – research questions

In the past four decades, Italy has experienced dramatic changes in the dimension and composition (though not so much in the geographical direction) of its internal population flows. Whilst in the aftermath of WWII Italy witnessed massive movements of labour from the South towards the Centre-North, such flows have been decreasing steadily since the 1970s despite the persisting economic differentials which, according to traditional theory, should have stimulated further movements (Padoa Schioppa and Attanasio, 1991). Interregional movements have started growing again only since the mid 1990s, and, albeit following largely the same direction, show two important differences: the numbers involved are much smaller

[1] The literature on migration networks has mostly focused on transnational rather than sub-national migration networks.

and the migrants are mostly young and highly educated. In other words, the South is currently experiencing a brain drain towards the rest of the country (Ciriaci 2005; Piras, 2005 and 2006; D'Antonio and Scarlato, 2007).[2]

Between 1980 and 2002 all Southern regions (with the exception of Abruzzo) registered a net loss of human capital, which grew even stronger since the mid 1990s when, for the first time in two decades, the total number of migrants started increasing again. To give an idea of the scale of the *brain drain*, the loss of University tertiary educated individuals in the South has gone from 4,828 in 1971 to 12,176 in 2002, with a constant increase since 1996 (Piras and Melis, 2007). Focusing specifically on recent graduates, D'Antonio and Scarlato (2007) show that the percentage of those who have studied in the South and have then moved to the North has gone from 5.4% in 1992 to 18% in 2001. At the same time, the number of those from the South who have studied in the North and stayed there has also grown, from 7.0% to 11.5%. The situation is further aggravated by the fact that Southern universities do not attract students from other parts of Italy (CNVSU, 2008).

Overall, the literature on the Italian case is in line with the afore-mentioned contributions. Whilst, indubitably the interregional difference in employed opportunities have played a key role (D'Antonio and Scarlato, 2007), Di Pietro (2005) and Dalmazzo and De Blasio (2007) have found that other local characteristics, such as quality of life or other urban amenities are also important in explaining the phenomenon. Furthermore, Marinelli (2011) has confirmed that Italian graduates are attracted to highly innovative regions as they seek opportunities to apply their skills.[3]

[2] It is important to notice that, this increasing internal brain-drain, is set against the background of an overall low early career and student mobility in comparison to other countries (Lindberg, 2009).

[3] Interestingly, as suggested by Carillo and Marselli (2003), the Italian industrial structure has also favoured high skilled over low skilled movements. Small firms, the bulk of the production system, recruit mostly through

To fully understand the drivers of the Southern brain drain the paper compares the spatial preferences and the role of social networks for Italy as a whole; for graduates leaving the South towards more developed parts of the country, and for those moving within the developed Centre-North. The underlying assumption is that, in line with Biagi et al (2011), graduates following different migration routes follow different drivers. Furthermore, we pay particular attention to those graduates whose jobs require exactly the skills they gained in their degree, as this gives us insights on the process of knowledge transfer between university and the labour market. Understanding this aspect is of paramount importance, as the brain drain, by depriving disadvantaged regions of a key resource for economic and innovative growth, can potentially widen sub-national disparities.

4. Methodology

4.1. Econometric techniques

This paper applies conditional logit (CL) models (McFadden, 1974), a particular case of the multinomial logit (ML). Whilst in the ML the explanatory variables refer to the decision-maker (i.e. the graduate), in the CL they are attributes of the alternatives to be chosen (i.e. of the potential regions of destination).

Mueller (1985) was among the first to apply a CL model to migration, when he examined individual destination choices among US states. However, probably because of software limitations, the CL model did not receive substantial attention among migration scholars until recently (Christiadi and Cushing, 2008). For instance Davies et al.(2001) applied it to study

---

informal channels therefore increasing the costs of job search for those living far from the firms' location. Individuals with a high level of human capital are still able to search nationally, whereas those with a low level of human capital will search only locally

interstate migration in the US, whilst Faggian (2005) used it to evaluate the utility of different types of graduate mobility in the UK, and Choe and La Brent (2009) applied it to their analysis of black migration in post-apartheid in South Africa.

One of the well-known disadvantages of the CL is its reliance on the IIA assumption, which states that the odds of choosing an alternative are independent from the choice-set itself. Not only the IIA is a restrictive and, in certain circumstances, unrealistic assumption, but it is also hard to identify its violation when the number of alternatives is large. Given these problems, it would seem more appropriate to use a model, which does not rest on such restrictive assumption, such as the multinomial probit (MP). However, preferring the MP to the CL is not a straightforward choice as the former presents present empirical drawbacks, which are not fully understood (Dahlberg and Eklöf 2003; Mazzanti, 2003; Dow and Endersby, 2004; Christiadi and Crushing, 2008). In particular, as opposed to the CL, the MP has serious identification problems, which increase with the number of alternatives.[4] Furthermore, as highlighted by Train (2003) a violation of the IIA becomes a serious issue only when researchers attempt to forecast the substitution patterns among the alternatives, a task not carried out in this study. When researchers are more concerned with knowing the individuals' average preferences, as is the case here, violating IIA is not a serious issue.

All in all, several scholars have suggested that the results of a conditional logit can often be used as a general approximation of models that relax IIA (Train, 2003; Christiadi and Crushing, 2008) and, in light of this debate, we apply exclusively conditional logit models.[5]

[4] In the MP, as the choice-set becomes larger, a separate identification of a subset of parameters is not only possible, but also hard to detect, leading to plausible, yet arbitrary or misleading estimates and inferences (see Weeks, 1997; and Dow and Endersby, 2004).

[5] Nonetheless in previous versions of this paper, we have applied both MP and CL models and highlighted how the main results coincided with the two techniques, regardless of the respect of the IIA assumption.

4.2. Data sources

The paper uses the *Indagine sull'Inserimento Professionale dei Laureati* (ISTAT, 2007) conducted 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 6th edition of the survey, which was carried out in 2004 and refers to 2001 graduates. The dataset contains 26,006 observations, representative of the universe of 155,664 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 the nation, the field of study and, most importantly, the region of study and the current region of work. As we identify migrants as those whose region of study (origin) is different than the region of employment and residence (destination)[6], this ensures a spatially unbiased analysis. Furthermore, the survey also asks respondents whether (a) their degree was *formally required* and (b) is *effectively necessary* to perform their current employment. We classify those who answered affirmatively to both questions as graduates who are using their academic skills in their jobs, thereby directly transferring university-knowledge to the labour market. As their education *matches* the needs of their job, we refer to this group as ***matched*** graduates.

In the econometric analysis the ISTAT survey is merged with other regional-level variables sourced from national an international sources, to test which regional features attract talent.

[6] In our study migrants do not include those who leave the region of study to go back to their home region (i.e. *returners*), as these graduates' mobility pattern may be driven by different motives. However, as the survey does not provide the home region of graduates previous to their university enrolment, identifying returners requires using other information from the survey. Specifically, the *Indagine* identifies (1) whether the graduate left the home region to attend university and (2) her/his current living arrangements. With this information we classified

4.3. Econometric specification and strategy[7]

The econometric analysis consists of several CL models in which the probability of choosing one of the twenty Italian regions as a destination depends on a series of regional attributes, distance, and social networks (as well as regional fixed effects to control for other excluded spatial features).

$$P_{ij} = P(U_{ij} > U_{iv}) \quad \forall \mathrm{j} \neq \mathrm{v}$$

$$U = f(BASE, RIS, QLIFE, NETWORK, FE)$$

Where

- P_{ij} is the probability that graduate *i* chooses *j* as a region of destination
- U is a utility function.
- BASE is a vector of variables capturing the traditional drivers of migration;
- RIS is a vector of variables capturing the regional innovation system
- QLIFE is a vector of variables capturing quality of life
- NETMIG measures the strength of the social networks between regions of origin and destination.
- FE are regional fixed effects to control for other spatial characteristics of the regions of destination.

---

returners 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.

[7] Appendix 1 contains a synopsis of all the variables.

All the regional attributes, which are described below, are expressed in terms of destination-to-origin ratios (D-O ratios). This has two advantages: first we are able to take into account the characteristics of both the region of origin and of destination. Secondly, we are effectively standardising the different sets of variables, making it possible to compare their relative importance.[8]

All the explanatory variables of our models are described below, the source of the indicators used is reported in parenthesis:

1. BASE variables

WAGE (CNL_RL) [9] is the D-O ratio of the average wage in 2003.

EMP (EUROSTAT REG_ECO)[10] is the D-O ratio of the employment rate in 2003.

POP (EUROSTAT REG_POP)[11] is the D-O ratio of the population (expressed in 1000 inhabitants) in 2003.

DIST (ACI)[12] is the distance (in 100km) between the main city of the region of origin and the main city of the region of destination. This variable captures the fact that migration is most likely across close areas.

DIST2 (ACI) is the squared distance (as defined above), which captures, as in Davies *et al.*(2001), the fact that the deterring effects of distance decline when the latter increases. In other words the marginal cost of moving a unit further is lower at greater distances.

2. RIS variables

[8] Other studies on migration use the D-O different, rather than the ratio. We preferred the latter as the former caused several problems related to a high collinearity among variables.
[9] Consiglio Nazionale di Economia e Lavoro, Redditi da Lavoro
[10] EUROSTAT Regional Economic Statistics
[11] EUROSTAT Regional Population Statistics.
[12] Automobil Club Italia.

HTKIEM (EUROSTAT REG_ST) is the D-O ratio of the percentage of employment in high-tech sectors (knowledge intensive services and high-technology manufacturing) in 2003. [13]

RDGOV (EUROSTAT REG_ST) is the D-O ratio of the proportion of public R&D expenditures on regional GDP in 2003.

RDBUS (EUROSTAT REG_ST) is the D-O ratio of the proportion of business R&D expenditures on regional GDP in 2003.[14]

3. QLIFE variables

CULT (ISTAT ICCVR)[15] is the proxy for cultural amenities and captures the D-O ratio of the proportion of employment in the cultural and recreation industries[16] in 2003.

CRIME (ISTAT ICCVR) captures the proportion of micro-criminality in cities. It is the D-O ratio of the number of micro-crime per 1000 citizens in 2003.

TRANS (ISTAT ICCVR) captures the availability of public transport. It is the D-O ratio of the number of public transport lines (in cities) per 100 square km in 2003.

4. NETMIG

[13] According to EUROSTAT knowledge intensive services include the following NACE REV 1.1 categories: 64 Post and telecommunications; 72 Computer and related activities; 73 Research and development. High technology manufacturing include the following NACE REV 1.1 categories: High-technology products; 30 Manufacture of office machinery and computers; 32 Manufacture of radio, television and communication equipment and apparatus; 33 Manufacture of medical, precision and optical instruments, watches and clocks; 35.3 Manufacture of aircraft and spacecraft.

[14] The RIS indicators have been selected to capture different aspects of the system: HTKIEM gives information on key features of the local economic structure, RDGOV and RDBUS control for the role of public and private actors. Nonetheless, as it is well known from the literature (e.g. IAREG, 2008), they are not able to able to measure the level of interaction among actors and provide only a static and partial picture of the system.

[15] ISTAT Indicatori di Contesto Chiave e Variabili di Rottura

[16] The sector, as defined by ISTAT, includes the following NACE Rev.1 categories: cinema and video production and distribution, radio and TV activities, other show-business activities, press agency, libraries, archives, museums and other cultural activities, sport and other recreational activities.

NETMIG (ISTAT, 2007): to account for the social support that mobile graduates receive from their peers we use the proportion of graduates from each region of origin living in each region of destination.

The empirical analysis consists of two models including (a) the BASE variables together with the other regional attributes (RIS and QLIFE), to analyse exclusively the macro determinants of migration and (b) a fully specified model (BASE, RIS, QLIFE and NETMIG) to explore the synergies between the meso and macro analysis of population flow. Each model is applied in turn to the whole sample of Italian migrants, the sub-sample of migrants from the South to the Centre-North and the sub-sample of migrants moving within the Centre-North. For each model, we compare migrants as a whole to *matched* migrants, to gain insights on the process of spatial knowledge transfer. Table 1 summarises this econometric strategy.

[Table 1 about here]

5. Econometric results

5.1. Results for migrants moving within Italy as a whole

Table 2, presents the econometric results for Italian migrants. Models I.1 and I.2 focus on the whole sample, whereas IM.1 and IM.2 cover *matched* graduates only.

[Table 2 about here]

Model I.1 broadly confirms our expectations regarding the macro-level drivers of migration. WAGE has positive and highly significant coefficient, indicating that graduates move from

less to more buoyant regions. HTKIEM (the D-O ratio of employment in high-tech sectors) and RDBUS (the D-O ratio of private R&D spending) are also positive and significant, indicating that graduates relocate to more innovative regions. Finally CRIM and TRANS are both significant and respectively negative and positive, suggesting that quality of life is an important issue when choosing where to live: graduates prefer regions with better transport infrastructure and lower micro-criminality. DISTANCE is negative and significant, confirming that migratory flows are stronger between closer regions.

Model I.2 confirms the importance of quality of life and regional innovative activities for high-skilled migrants: graduates prefer more innovative regions (RDGOV and HTKIEM are positive and significant) with a higher quality of life (CULT, TRANS and CRIM are significant and have all the expected sign). POP, capturing the population size is also significant and has the expected sign. Interestingly, in this model the variables accounting for distance and economic performance (WAGE and EMP), which are critical in the mainstream approach to migration, are not significant, whilst NETMIG (capturing the role of social networks) is positive and highly significant. This indicates that the social dimension of migration cannot be ignored when attempting to understand spatial patterns as it is a better predictor of the destination choice than economic differentials.

The results for matched graduates are broadly in line with those for graduates as a whole, although RDBUS (capturing private R&D investment) is not significant in model IM.1, whereas the proportion of employment in high-tech sectors (HTKIEM) and transport infrastructure (TRANS) do not seem to play a role in model IM.2.

5.2. Results for migrants moving from the South to the Centre-North

Table 3 presents the econometric results for Southern migrants relocating to the Centre-North, the left two columns (models S.1 and S.2) cover the whole group, whereas the right two columns focus on matched migrants (models SM.1 and SM.2).

[table 3 about here]

The results of model S.1 display some interesting features for Southern graduated moving to the Centre-North. We notice that EMP (the D-O ration of employment rate) is positive and significant, whilst WAGE is not significant. Among the regional innovation system variables only RDGOV (the D-O ration of public R&D spending) is significant and of the expected sign. This result effectively captures the role of Rome, the capital city of Italy, where most public R&D spending is concentrated and where many Southern graduates relocate.

As for quality of life variables, Southern graduates move towards areas with lower micro-criminality (CRIM is negative and significant). Interestingly, the coefficient capturing cultural amenities (CULT), which was positive for Italian graduates as a whole, is significant but negative: Southern graduates do not seek cultural amusement when deciding to relocate. Finally DISTANCE and DISTANCE2 have the expected signs (negative and positive respectively) and are highly significant.

In model S.2 NETMIG (capturing the support of social networks) is positive and highly significant, however, none of the variables capturing the regional knowledge-base are; furthermore of the BASE variables only DISTANCE2 is significant and of the expected positive sign, whereas CRIM is the only (negative) and significant variable among those capturing quality of life. For this group of graduates, social networks seem to be more important than regional characteristics to understand destination choices.

Model SM.1 -covering matched graduates- is overall in line with model S.1, with the exception of the regional knowledge-base variables. Matched graduates are attracted to regions with a strong employment in high-tech sectors rather than areas with strong public or private R&D (HTKIEM is positive and significant). Furthermore the coefficient of HTKIEM plays a much larger role than any other regional characteristic (excluding employment rate) in determining the destination choice. This result is confirmed in model SM.2 where HTKIEM and CRIM (the level of micro-criminality) are the only two significant coefficients and have the expected sign. Remarkably, for matched Southern graduates, social networks do not seem to play a role: the opportunity to be in a highly-innovative environment emerges as the main determinant of their destination choice.

5.3. Results for migrants moving within the Centre-North

Table 4, presents the econometric results for migrants within the Centre-North of the country. Models CN.1 and CN.2 cover the whole population of migrants, whereas CNM.1 and CNM.2 cover only matched graduates.

[Table 4 about here]

A completely different pattern emerges from migrants moving within the richer Centre-North. In CN.1, WAGE is not significant whereas EMP (the D-O ratio of employment rate) is significant and negative. Migrants within this area are clearly not moving to improve their economic position. As for regional knowledge variables, these graduates are attracted to regions with larger employment in knowledge intensive industries, but not to regions with a strong formal R&D (HTKIEM is positive and significant, whereas RDGOV and RDBUS are negative and significant). Quality of life also plays an important role in their migratory decisions. In particular graduates moving within the Centre-North are attracted by higher cultural amenities and better transport infrastructure (CULT and TRANS are positive and significant and CULT has the highest positive coefficient). Finally POP, DISTANCE and DISTANCE2 have the expected sign and are significant.

Similar patterns emerge when migration networks are taken into account, as in model CN.2. This model confirms that a dynamic labour market does not per se attract talent: WAGE and EMP are indeed negative and significant. It also confirms that formal R&D is not an attractive regional feature (RDGOV is negative and significant). Finally it confirms that, among the quality of life variables, the availability of cultural amenities is of critical importance (CULT is positive and highly significant). NETMIG is, as expected, positive and significant, confirming that the support of peers is critical when deciding where to relocate.

Model CNM.1 shows that also matched migrants do not move in search of better employment opportunities (EMP is negative and significant), nor are they attracted to areas with strong basic research (RDBUS is negative and significant). Model CNM.2 which includes also the sociological drivers of migration confirms again the networks are critical to

understand graduate flows (NETMIG is positive and significant). It also confirms that migration within the Centre-North is more a matter of lifestyle than necessity: WAGE is negative and highly significant, whereas CULT is positive and highly significant. Interesting, CRIM, measuring the D-O ratio of micro-criminality is positive and significant, indicating that this group of migrants is not concerned about moving towards less safe areas.

6. Conclusions

This paper has analysed the locational choice of Italian graduates providing both theoretical and empirical insights. As for the former the determinants of the region of destination have been analysed both from both a macro and a meso level perspective, a task rarely undertaken in economic-geography studies of migration. As for the latter, we have compared the preferences and behaviour of migrants from different geographies, paying particular attention to those transferring their academic knowledge in the labour market.

At the theoretical level the results confirm that regional innovation and quality of life are key structural drivers of migration. However they also point out that social networks, as mechanisms supporting the process, cannot be ignored. The choice of region of destination, indeed, is largely dependent on the existence of communities of peers that help the migrant through a *beaten path*, facilitating the process of relocation. Skilled migration, in other words, has emerged as a collective, rather than an individual phenomenon. Networks, seem to be especially important for the whole group Southern graduates relocating to the Centre-North. As they embark in a more complex journey, moving between regions with extremely different characteristics, the support of peers seems critical to reduce the distance from home.

The analysis has also showed that migrants who apply their academic background have similar preferences than the rest of graduates, with the exception of those moving from the South to the Centre-North. In this case, matched-migrants are more strongly attracted to areas with more employment in knowledge intensive sectors, as these provide opportunities to contribute and acquire knowledge. This is an unsurprising yet crucial result. It indicates that a cycle of human capital accumulation and knowledge creation may be generated in the most dynamics part of the country, widening the marked sub-national disparities.

The most striking result, in line with Biagi et al. (2011)[17], is that graduate migration in Italy effectively consists of two parallel phenomena. Graduates who move within the more developed Centre-North have different preferences and behaviour than those who leave the less developed Mezzogiorno. For the former lifestyle and in particular the presence of cultural amenities seems to play a major role. The latter, on the other hand, cannot afford such luxury: for Southerners mobility is largely an economic choice, driven by necessity.

To conclude, the results are rich in policy implications. First of all they indicate that policies aimed at attracting talent, rather than focussing on regional characteristics, should aim at understanding and accessing migration networks. Incidentally, universities could play an important role as they could access networks by actively engaging with their alumni. More generally, and more importantly, the results show how investment in higher education in the Mezzogiorno is not sufficient to generate the desired local development. The South is not able to retain its graduates, who chose to give up on a better quality of life in search of opportunities elsewhere in the country. Education policies, therefore, needs to be

[17] Biagi et al (2011) focus on Italian migration as a whole, rather than on young graduates.

accompanied by a industrial and innovation policy measures that enable Southern graduates to develop their career and transfer their knowledge in the local labour market.

Appendix 1 – Synopsis of the variables

1. BASE Variables

WAGE – D-O ratio of the average wage in 2003.

EMP – D-O ratio of the employment rate in 2003.

POP – D-O ratio of the population (expressed in 1000 inhabitants) in 2003.

DIST – distance (in 100km) between the main city of the region of origin and the main city of the region of destination.

DIST2 (ACI) – squared distance (as defined above).

2. RIS Variables

HTKIEM – D-O ratio of the percentage of employment in high-tech sectors in 2003.

RDGOV – D-O ratio of the proportion of public R&D expenditures on regional GDP in 2003.

RDBUS – D-O ratio of the proportion of business R&D expenditures on regional GDP in 2003

3. QLIFE Variables

CULT – D-O ratio of the proportion of employment in the cultural and recreation industries in 2003.

CRIME captures the proportion of micro-criminality in cities. It – D-O ratio of the number of micro-crime per 1000 citizens in 2003.

TRANS captures the availability of public transport. It – D-O ratio of the number of public transport lines (in cities) per 100 square km in 2003.

4. NETMIG

NETMIG (ISTAT, 2007) – captures the social networks of migrants between two regions.

Appendix 2 regional fixed effects

	ITALIAN MIGRANTS		ITALIAN MATCHED MIGRANTS	
	REGIO	REGIO + NETWORK	REGIO	REGIO + NETWORK
	I.1	I.2	IM.1	IM.2
Valle d'Aosta	-2.135***	-2.375***	-2.271*	-2.291**
	(-3.28)	(-3.70)	(-1.90)	(-1.98)
Trentino Alto Adige	-0.928***	-0.925***	-20.15***	-21.23***
	(-3.33)	(-3.54)	(-53.14)	(-57.74)
Veneto	3.138***	0.35	-18.29***	-19.38***
	(10.29)	(1.05)	(-36.76)	(-27.62)
Friuli Venezia Giulia	-0.0963	-0.787***	-19.72***	-21.51***
	(-0.39)	(-3.37)	(-60.67)	(-66.78)
Liguria	-0.225	-0.800***	-1.072***	-1.523***
	(-0.94)	(-3.57)	(-2.58)	(-3.97)
Emilia Romagna	1.540***	0.444	1.543***	0.269
	(4.66)	(1.34)	(2.89)	(0.50)
Toscana	1.877***	-0.112	-18.67***	-21.50***
	(5.38)	(-0.31)	(-33.27)	(-36.29)
Umbria	2.470***	-0.65	1.907**	-1.425
	(4.76)	(-1.19)	(2.03)	(-1.43)
Marche	2.515***	-0.0793	2.028***	-0.853
	(5.54)	(-0.16)	(2.73)	(-1.03)
Lazio	-1.604***	-1.411***	-2.498***	-1.970***
	(-4.38)	(-3.17)	(-3.85)	(-2.58)
Abruzzo	3.116***	-0.633	2.043**	-1.751**
	(5.81)	(-1.14)	(2.45)	(-2.00)
Molise	3.075***	-1.087*	1.853*	-1.955*
	(5.13)	(-1.81)	(1.88)	(-1.95)
Campania	4.287***	-0.786	2.422	-2.484
	(4.65)	(-0.87)	(1.58)	(-1.61)
Puglia	5.032***	-0.203	2.994**	-1.768
	(6.17)	(-0.26)	(2.33)	(-1.39)
Basilicata	5.633***	0.0216	3.901***	-1.528
	(7.98)	(0.03)	(3.44)	(-1.28)
Calabria	5.833***	-0.115	3.855**	-2.174
	(6.39)	(-0.12)	(2.56)	(-1.37)
Sicilia	5.086***	-0.606	2.943**	-1.982
	(5.54)	(-0.70)	(1.97)	(-1.37)
Sardegna	3.375***	-1.391**	1.864*	-2.445**
	(5.19)	(-2.17)	(1.78)	(-2.33)

p<0.10, ** p<0.05, *** p<0.01; t scores in parentheses

	SOUTHERN MIGRANTS		SOUTHERN MATCHED MIGRANTS	
	REGIO	REGIO + NETWORK	REGIO	REGIO + NETWORK
	S.1	S.2	SM.1	SM.2
Valle d'Aosta	-0.3	1.158	4.589	4.344
	(-0.10)	(0.39)	(0.75)	(0.75)
Trentino Alto Adige	-4.382***	-1.142	-23.37***	-22.85***
	(-5.38)	(-1.01)	(-16.95)	(-12.70)
Veneto	-0.173	0.847	-8.706	-8.215
	(-0.07)	(0.31)	(-1.54)	(-1.58)
Friuli Venezia Giulia	-1.558	-1.09	-16.99***	-18.01***
	(-1.37)	(-0.89)	(-7.75)	(-8.85)
Liguria	1.039	-0.497	0.884	-0.0894
	(0.91)	(-0.40)	(0.33)	(-0.03)
Emilia Romagna	-2.725**	0.941	2.361	3.9
	(-1.97)	(0.57)	(0.98)	(1.62)
Toscana	-0.371	-0.483	-11.96***	-13.00***
	(-0.17)	(-0.21)	(-2.71)	(-3.12)
Umbria	-0.912	-2.279	10.98*	10.25
	(-0.26)	(-0.62)	(1.67)	(1.61)
Marche	-2.36	-1.781	7.339	7.522
	(-0.76)	(-0.56)	(1.27)	(1.39)
Lazio	5.111**	0.342	-2.954	-5.253
	(2.26)	(0.14)	(-0.71)	(-1.35)
Abruzzo	-19.72***	-22.93***	-6.019	-7.631
	(-5.52)	(-6.03)	(-0.86)	(-1.12)
Molise	-14.87***	-21.95***	4.743	3.008
	(-2.99)	(-4.02)	(0.46)	(0.29)
Campania	-13.77**	-26.51***	8.035	2.116
	(-2.16)	(-3.69)	(0.63)	(0.16)
Puglia	-14.02**	-24.92***	5.826	-0.573
	(-2.50)	(-3.92)	(0.50)	(-0.05)
Basilicata	-16.67***	-23.96***	3.655	-0.718
	(-2.99)	(-3.93)	(0.33)	(-0.06)
Calabria	-13.27**	-23.80***	8.636	3.105
	(-2.03)	(-3.23)	(0.66)	(0.23)
Sicilia	-12.15**	-23.70***	6.625	0.00961
	(-2.26)	(-3.67)	(0.59)	(0.00)
Sardegna	-15.83***	-22.22***	0.353	-3.67
	(-3.72)	(-4.67)	(0.04)	(-0.41)

p<0.10, ** p<0.05, *** p<0.01; t scores in parentheses

	CN to CN MIGRANTS		CN to CN MATCHED MIGRANTS	
	REGIO	REGIO + NETWORK	REGIO	REGIO + NETWORK
	CN.1	CN.2	CNM.1	CNM.2
Valle d'Aosta	-1.865	-2.427	1.076	-6.233**
	(-1.34)	(-1.57)	(0.46)	(-2.16)
Trentino Alto Adige	1.874**	1.392	-18.65***	-23.22***
	(2.22)	(1.31)	(-12.07)	(-10.86)
Veneto	2.840***	-1.265	-20.44***	-28.21***
	(3.15)	(-1.36)	(-10.60)	(-10.42)
Friuli Venezia Giulia	-0.138	-0.437	-21.32***	-23.01***
	(-0.31)	(-0.90)	(-24.29)	(-22.45)
Liguria	-2.874***	-1.907***	-3.351***	-0.248
	(-6.16)	(-3.84)	(-3.80)	(-0.24)
Emilia Romagna	5.043***	1.009	5.890***	-5.971*
	(4.43)	(0.78)	(2.58)	(-1.91)
Toscana	0.126	-2.535***	-21.60***	-26.82***
	(0.13)	(-2.58)	(-10.41)	(-12.11)
Umbria	-0.687	-4.235***	-1.187	-6.035*
	(-0.46)	(-2.81)	(-0.36)	(-1.69)
Marche	2.449*	-1.767	1.905	-5.968*
	(1.83)	(-1.30)	(0.65)	(-1.84)
Lazio	-9.156***	-3.518**	-10.62***	4.973
	(-5.94)	(-1.98)	(-3.29)	(1.23)
Abruzzo	-24.29***	-28.12***	-24.32***	-26.46***
	(-16.14)	(-17.47)	(-7.99)	(-8.31)
Molise	-27.60***	-28.62***	-29.18***	-20.51***
	(-13.03)	(-11.89)	(-6.93)	(-4.26)
Campania	-34.17***	-34.74***	-36.62***	-22.57***
	(-9.62)	(-8.33)	(-5.39)	(-2.82)
Puglia	-33.11***	-33.72***	-36.80***	-18.44**
	(-10.07)	(-8.58)	(-6.03)	(-2.57)
Basilicata	-27.96***	-30.85***	-30.56***	-22.47***
	(-10.59)	(-10.08)	(-6.04)	(-3.92)
Calabria	-30.72***	-31.91***	-33.89***	-20.84***
	(-9.06)	(-8.06)	(-5.19)	(-2.75)
Sicilia	-31.26***	-31.37***	-35.70***	-17.27**
	(-8.67)	(-7.34)	(-5.53)	(-2.38)
Sardegna	-27.54***	-29.37***	-30.30***	-21.84***
	(-12.35)	(-11.13)	(-7.27)	(-4.67)

p<0.10, ** p<0.05, *** p<0.01; t scores in parentheses

References

Barca F (2006) *Italia frenata, paradossi e lezioni della politica per lo sviluppo.* Rome, Donzelli

Biagi B, Faggian A, Mccann P (2011) Long and short distance migration in Italy: the role of economic, social and environmental characteristics. *Spatial Economic Analysis* 6*:* 111-131

Boyd M, (1989) Family and personal networks in international migration: recent developments and new agendas. *International Migration Review* 23*:* 638-70

Carillo M, Marselli R (2003) Internal migration and search costs in Italy: the role of regional production system. Working Paper, Unversity of Naples

Ciriaci D (2005) La fuga del capitale umano qualificato dal mezzogiorno: un catching-up sempre più difficile. *Rivista Economica del Mezzogiorno* 2 : 369- 403

Cebula Rj (2005) Internal migration determinants: recent evidence. *International Advances in Economic Research* 11*:* 267–274

Choe C, Labrent CE (2009) Internal migration of blacks in South Africa: self-selection and brain drain. IRISS Working Paper 2009-06, IRISS at CEPS/INSTEAD

Christiadi C, Cushing B (2008) Conditional logit, iia, and alternatives for estimating models of interstate migration . Research Paper 2007-4, West Virginia University

Cnvsu (2008) Nono rapporto sullo stato del sistema universitario . Ministero dell'Universita' e della Ricerca, Rome

Dahlberg M, Eklof M (2003) Relaxing the iia assumption in locational choice models: a comparison between conditional logit, mixed logit, and multinomial probit models . Economics Department Working paper 9-2003, Uppsala University

Dalmazzo A, De Blasio G (2007) Skill biased agglomeration effects and amenities: theories with an application to the italian case . Quaderni del Dipartimento di Economia Politica 503, University of Siena

D'antonio M, Scarlato M (2007) I laureati del mezzogiorno: una risorsa sottoutilizzata o dispersa . Quaderni SVIMEZ, SVIMEZ, Roma

Davies P, Greenwood MJ, Li H (2001) A conditional logit approach to US state-to-state migration. *Journal of Regional Science* 41*:* 337–360

Di Pietro G (2005) On migration and unemployment: evidence from Italian graduates. *Economic Issues* 10*:* 11-28

Dow JK, Endersby JW (2004) Multinomial probit and multinomial logit: a comparison of choice models for voting research. *Electoral Studies* 23*:* 107-122

Faggian A (2005) *Human capital, migration and local labour markets: the role of the higher education system in Great Britain* Doctoral Thesis, University of Reading, Reading

Faggian A, MCcann P (2006) Human capital flows and regional knowledge assets: a simultaneous equation approach. *Oxford Economic Papers* 58: 475-500

Faggian A, MCcann P (2009) Universities, agglomerations and graduate human capital mobility. *Tijdschrift Voor Economische En Sociale Geografie* 100: 210–223

Florida R (2002a) *The rise of the creative class* New York, Basic Books

Florida R (2002b) The economic geography of talent. *Annals of the Association of Regional Geographers* 92*:* 743-755

Giannetti M (2001) Skill complementarities and migration decisions. *Labour* 15*:* 1-31

Giannetti M (2003) On the mechanics of migration decisions: skill complementarities and endogenous price differentials. *Journal of Development Economics* 71*:* 329-349

Goss J, Lindquist B (1995) Conceptualizing international labour migration: a structuration perspective. *International Migration Review* 29*:* 317-351

Gottlieb PD, Joseph G (2006) College-to-work migration of technology graduates and holders of doctorates within the United States. *Journal of Regional Science* 46: 627–659

Guilmoto Cz, Sandron F (2001) The internal dynamics of migration networks in developing countries. *Population An English Selection* 13*:* 135-164

Haug S (2008) Migration networks and migration decision-making. *Journal of Ethnic and Migration Studies* 34*:* 585-605

IAREG (2008) Report on traditional and new indicators of science, technology & innovation (STI) and knowledge accumulation. IAREG Working Paper

Istat (2007) Indagine campionaria sull'inserimento professionale dei laureati. ISTAT, Rome

Linberg M (2009) Student and early career mobility patterns among highly educated people in Germany, Finland, Italy, and the United Kingdom. *Higher Education* 58: 339-358

Marinelli E (2011) Graduate migration and innovation in the Italian regions. London School of Economics and Political Sciences, Mimeo

Massey D S (1990) Social structure, household strategies, and the cumulative causation of migration. *Population Index* 56*:* 3-26

Mazzanti M (2003) Discrete choice models and valuation experiments. *Journal of Economic Studies* 30*:* 584-604

Mcfadden D (1974) *Conditional logit analysis of qualitative choice behavior* in Zarembka P *(ed.)* Frontiers in Econometrics, Chapter 4, 105-142. New York, New York Academic Press

Mueller CF (1985) *The economics of labor migration, a behavioral analysis* New York, Academic Press

Padoa Schioppa F, Attanasio O (1990) Regional Inequalities, Migration and Mismatch in Italy 1960-1986. In: Padoa Schioppa F (Ed.) *Mismatch and Labour Mobility*. Cambridge, Cambridge University Press

Pekkala S (2003) Migration flows in Finland: regional differences in migration determinants and migrant types. *International Regional Science Review* 26*:* 466-482

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

Piras R, Melis S, (2007) Evoluzione e tendenze delle migrazioni interne. *Economia Italiana* 2*:* 437-461

Portes A, Bach R (1985) *Latin journey: Cuban and Mexican immigrants in the united states* Berkeley, University of California Press

Portes A, Guarnizo LE, Landolt P (1999) (Eds) Transnational communities. special issue.. *Ethnic and Racial Studies* 22*:* 463-477

Rindoks A, Penninx R, Rath J (2006) Gaining from migration: what works in networks? examining economically related benefits accrued from greater economic linkages, migration processes, and diasporas . IMISCOE Working Paper, 13, Institute for Migration and Ethnic Studies, Amsterdam

Ritsila J, Ovaskainen M (2001) Migration and regional centralization of human capital. *Applied Economics* 33*:* 317-325

Rutten R, Gelissen J (2008) Technology, talent, diversity and the wealth of European regions. *European Planning Studies* 16*:* 985-1006

Sjaastad LA (1962) The costs and returns of human migration. *Journal of Political Economy* 70*:* 80-93

Train K (2003) *Discrete choice method with simulation* Cambridge MA, Cambridge University Press

Van Dalen HP, Henkens K (2007) Longing for the good life: understanding emigration from a high-income country. *Population and Development Review* 33*:* 37-65

Vertovec S (2002) Transnational networks and skilled labour migration. Paper presented at the conference "Migration", Ladenburg, 14-15 February

Viesti G (2003) *Abolire il mezzogiorno* Bari, Laterza

Weeks M (1997) The multinomial probit model revisited: a discussion of parameter estimability, identification and specification testing. *Journal of Economic Surveys* 11*:* 297-320

Table 1 Summary of econometric analysis

Model Name	Variables[18] included	Geographies of migration	Types of graduates
1. REGIO	BASE + RIS + QLIFE	• Italy as a whole • South-to-CN • CN to CN	All graduates *Matched* graduates (transfer academic knowledge in their jobs)
2. REGIO+NETWORKS	BASE + RIS+ QLIFE + NETMIG		

Table 2 Migration behaviour of Italian graduates

	Italy all graduates		Italy matched graduates	
	REGIO	REGIO + NETWORK	REGIO	REGIO + NETWORK
	I.1	I.2	IM.1	IM.2
WAGE	27.96***	3.067	28.68***	-0.927
	(6.17)	(0.60)	(3.38)	(-0.10)
EMP	2.022	-1.331	-1.975	-3.254
	(1.10)	(-0.75)	(-0.68)	(-1.15)
HTKIEM	0.953***	0.498***	0.521*	0.505
	(8.01)	(3.37)	(1.76)	(1.43)
RDGOV	0.0084	0.0265**	0.0121	0.0475**
	(0.82)	(2.08)	(0.71)	(2.22)
RDBUS	0.0141*	0.0106	0.0037	0.0114
	(1.90)	(1.20)	(0.28)	(0.77)
CULT	-0.389	0.673**	0.0294	1.069**
	(-1.35)	(2.19)	(0.07)	(2.33)
TRANS	0.667***	0.187**	0.475***	0.101
	(8.38)	(2.54)	(3.36)	(0.86)
CRIM	-0.126*	-0.275***	-0.311**	-0.413**
	(-1.87)	(-3.33)	(-2.18)	(-2.46)
NETMIG		0.213***		0.239***
		(26.58)		(14.48)
POP	5E-09	7.08e-08*	5E-08	1E-07
	(0.12)	(1.77)	(0.74)	(1.61)
DISTANCE	-0.176***	-0.031	-0.0928**	-0.006
	(-7.95)	(-1.32)	(-2.52)	(-0.16)
DISTANCE2	0.002	-3E-04	-2E-04	-7E-04
	(1.28)	(-0.16)	(-0.06)	(-0.25)
N	90600	90600	28500	28500
Pseudo R2	0.1950	0.2524	0.3153	0.3653

* p<0.10, ** p<0.05, *** p<0.01; t scores in parentheses

[18] All models include also regional fixed effects which are reported in Appendix 2.

Table 3 Migration behaviour of Southern graduates moving to the Centre-North

	Southern graduates		Southern matched graduates	
	REGIO	REGIO + NETWORK	REGIO	REGIO + NETWORK
	S.1	S.2	SM.1	SM.2
WAGE	-4.727	-12.11	80.05	77.24
	(-0.16)	(-0.42)	(1.48)	(1.47)
EMP	24.40***	-4.594	26.49**	12.62
	(4.12)	(-0.53)	(2.24)	(0.86)
HTKIEM	1.714	1.801	5.954*	5.595*
	(1.47)	(1.44)	(1.83)	(1.86)
RDGOV	0.0927**	0.00973	0.0467	-0.0057
	(2.18)	(0.22)	(0.64)	(-0.07)
RDBUS	-0.0092	-0.0115	-0.0428	-0.0447
	(-0.74)	(-0.85)	(-1.58)	(-1.60)
CULT	-1.604***	-0.116	-2.581**	-1.678
	(-2.72)	(-0.18)	(-2.52)	(-1.34)
TRANS	-0.179	-0.0553	0.212	0.263
	(-1.02)	(-0.33)	(0.62)	(0.79)
CRIM	-0.901***	-0.868***	-1.004***	-0.943***
	(-6.34)	(-5.37)	(-4.40)	(-4.11)
NETMIG		0.139***		0.0667
		(4.67)		(1.42)
POP	1.8E-07	3.7E-07	-5E-07	-4E-07
	(0.78)	(1.55)	(-1.17)	(-1.00)
DISTANCE	-0.319***	-0.119	-0.293**	-0.18
	(-3.72)	(-1.28)	(-2.12)	(-1.17)
DISTANCE2	0.0202***	0.00861*	0.0165**	0.00961
	(4.64)	(1.86)	(2.19)	(1.10)
N	26080	26080	9680	9680
Pseudo R2	0.4437	0.4473	0.5703	0.5710

* p<0.10, ** p<0.05, *** p<0.01; t scores in parentheses

Table 4 Migration behaviour of graduates moving within the Centre-North

	Centre-North to Centre-North migrants		Centre-North to Centre-North matched migrants	
	REGIO	REGIO + NETWORK	REGIO	REGIO + NETWORK
	CN.1	CN.2	CNM.1	CNM.2
WAGE	19.38	-29.05*	23.18	-66.06*
	(1.29)	(-1.91)	(0.68)	(-1.87)
EMP	-47.54***	-25.19**	-58.93***	35.88
	(-5.03)	(-2.16)	(-3.33)	(1.40)
HTKIEM	0.451***	0.115	0.333	0.126
	(3.48)	(0.69)	(1.20)	(0.40)
RDGOV	-0.0373**	-0.0408*	-0.0062	-0.00204
	(-2.24)	(-1.85)	(-0.23)	(-0.06)
RDBUS	-0.439***	-0.00606	-0.821***	-0.0119
	(-3.90)	(-0.04)	(-2.66)	(-0.04)
CULT	2.918***	3.893***	1.587	3.873***
	(3.71)	(4.12)	(1.10)	(2.85)
TRANS	0.436**	-0.355	-0.0224	-0.391
	(2.13)	(-1.29)	(-0.06)	(-0.71)
CRIM	-0.0936	0.08	-0.0937	1.319**
	(-0.77)	(0.49)	(-0.30)	(2.38)
NETWORK		0.247***		0.364***
		(19.59)		(11.55)
POP	0.000000312***	0.0000004***	0.000000375*	1.92E-07
	(2.68)	(3.06)	(1.67)	(0.81)
DISTANCE	0.487***	0.525***	0.745***	0.11
	(7.52)	(6.16)	(5.52)	(0.58)
DISTANCE2	-0.0977***	-0.0849***	-0.109***	-0.0158
	(-7.17)	(-5.79)	(-4.26)	(-0.53)
N	49060	49060	13840	13840
Pseudo R2	0.3088	0.3809	0.4775	0.5500

p<0.10, ** p<0.05, *** p<0.01; t scores in parentheses