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Interregional Migration Among Recent Italian University Graduates

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1. Introduction

Since Lucas (1988) and Romer (1990) there has been widespread consensus on the role of human capital in enhancing opportunities for regional and national economic growth. Several empirical studies provide evidence of spatial relationship between human capital and economic performance and show how lack of human capital accumulation is a determinant and a consequence of a lagging economy. It is not a case that in Europe, the share of highly educated people aged 25-64 is considerably lower in Convergence than in Regional Competitiveness and Employment regions, 17% and 25% respectively (EC, 2008). Raising education levels therefore is seen as a goal for structural policy aimed at promoting regional economic growth and welfare.

In an attempt to raise education levels, the Italian Mezzogiorno has experienced a policy of 'university proliferation' in recent decades. This policy is not explicitly implemented by central government as being a regional policy tool, but is being enforced through the efforts of regional and local governments, which are certainly not adverse to the idea of new universities, or new branches of already existing academic institutions, being established within their territories. This policy is being supported by several local (and non-local) stakeholders and adopts significant rhetoric, such as 'universities are engines or boosters of regional growth' and 'universities as the nodes or hubs within networks of knowledge' (a comprehensive and amusing list of such metaphors is provided in Arbo, 2007). This focus is also evident in local demand, and especially a latent local demand for higher education to be provided through more evenly distributed supply. Consequently, in 1990-2000 the number of cities in Italy with university sites increased from 104 to 196 (Bratti *et al.*, 2008) and to 278 during the academic year 2004/05, 104 of which were located in the South (MUR, 2006).

However, human capital is mobile and increasing the number of graduates at a particular university location does not mean that the number of graduates that live and work in the same location will increase. The collective gains from higher education might not necessarily flow into the pockets of those local communities that have contributed to financing and setting up these academic institutions. Flows of out-migration of well-educated young people, if not balanced by corresponding inflows, will become the foundations for a brain drain phenomenon that will counterbalance the expected positive local impacts of an increased number of higher education institutions. This has become established in the South of Italy, where a shortage of employment opportunities combined with social attitudes that have a negative effect on the labour market functioning, are stimulating new university graduates to move to the more developed and industrialised regions of the Italy.

Over the last two decades, the brain drain phenomenon has attracted the attention of policy-makers and the media in Italy, and especially in terms of the number of excellent researchers and other talented people who are going abroad, because of the flawed national scientific and technological research system (Peri, 2002; Becker *et al.*, 2004). More recently, there has been a recognition in this debate that there is also an internal problem (Banca d'Italia, 2005a; Ciriaci, 2005; D'Antonio, Scarlato, 2007; Scarlato, 2007; Svimez, 2005; Viesti, 2005a; Viesti, 2005b), which, however, is somewhat different in nature and quality. It is not restricted to a group of high profile scientists, but involves larger groups of young people who could contribute to raising the average level of education of the communities to which they belong and, presumably, to raising the quality of the local labour force and contributing to the social environment.

This paper aims to provide evidence on the phenomenon of an interregional brain drain in Italy, based on recent university graduates; offer some insights on the different channels of interregional mobility; and test some hypotheses about the likely determinants of mobility. The paper is organised as follows. In section 2 we review the literature in order to define some working hypotheses on the determinants of migration; in section 3 we present the data-set and methodology for the econometric investigation. Section 4 provides some stylised facts on internal mobility during the last decade, and section 5 discusses the econometric findings from our investigation. Finally, section 6 concludes the work.

2. Related literature and working hypotheses

There is a very large literature on migration related-questions, most of which focuses on international migrations, its determinants and the economic consequences for the sending and receiving countries. Since the mid '60s, there has been increasing concern over the migration of highly educated and skilled people, and the "brain drain" phenomenon has become part of the economics literature (see for example Johnson, 1965 and Grubel and Scott, 1966). A pioneering study by Sjaastad (1962), a few years earlier, concentrated on income differentials as the driving force of migration. The returns from migration increase the younger and the more able or educated the individual is (Borjas, 2000); thus it follows that the relationship between education and migration is bi-directional, although the signs may be subject to controversy: on the one hand, the most educated people may derive greater advantage from migrating; on the other hand, the opportunity or the need to migrate may become incentives or disincentives for investments in education in the migrant-sending area, with corresponding beneficial or detrimental effects (see, for example, Mountford, 1997, and Boucher *et al.*, 2005, for arguments supporting the existence of "brain gain" in contrast to the more traditional "brain drain" approach). Regets (2001) proposed a comprehensive list of the likely effects of skilled migration on the sending

and receiving countries, although only a few have been established empirically. Shachar (2006) reviews national regimes in several developed countries aimed at attracting international flows of talented people and discusses the relatively recent entry into the race for skilled migrants of European countries such as Germany, the UK and Sweden. Some more recent studies have focused on the mobility of highly skilled workers, suggesting the need to go beyond a strict dichotomy in favour of a shorter term vision, in which the notion of migration is replaced by circulation and mobility (Trippl and Maier, 2007).

Concern over brain drain has extended to interregional flight within developed economies. Empirical investigations have been carried out in several countries, including the US (Hansen *et al.*, 2003; Baumann and Reagan, 2005; Brome, 2007), Germany (Arntz, 2006), Norway (Stambøl, 2003), Switzerland (Egger, Stalder and Wenger, 2003), UK (Faggian *et al.*, 2007; WDA, 2003), and Italy (Banca d'Italia, 2005a; Ciriaci, 2005; D'Antonio and Scarlato, 2007; Etzo, 2008; Scarlato, 2007; Svimez, 2005; Viesti, 2005a; Viesti, 2005b). The EU's institutional documentation concentrates on the problems affecting the EU's less favoured regions (EC 2001a; EC 2001b) and a project on "Human capital in European peripheral regions: brain - drain and brain – gain" is currently being funded under the Interreg IIIB NEW programme (http://www.brain-drain.org). The areas involved in this programme are the region of Twente in the Netherlands, the cantons of Lucerne and Uri in Switzerland and West Pfalz in Germany.

As this paper focuses on the determinants of internal migration of highly educated young people in an advanced unevenly developed economy such as Italy, based on this large body of literature we propose some working hypotheses that could explain the choice to migrate, and, in particular, to migrate from the South of Italy to other parts of the country.

Θ_1 According to the literature, which regards migration as investment in human capital, the benefits of migration measured by the expected (monetary and physical) income flows to destinations, should be compared with the costs of migrating, that is the actual costs of moving and the opportunity costs due to the missed expected income in the place of origin. In a simplified model, spatial mobility is expected to be positively correlated with nominal wage.

Θ_2 Insofar, as employment opportunities are unevenly distributed across space, it is necessary to include a regional element in the explanatory variables. In a dual economy, the region with modest employment opportunities and high unemployment is associated with a lower internal expected income, that is, lower opportunity cost of migration; this raises the likelihood of out-migration. In a reduced model, a dummy variable representing the two areas in a dual economy, should be highly

correlated with migration likelihood. Clearly, the dummy variable averages the effects of all the characteristics of these areas, which cannot be differentiated into unique elements for various reasons, including social and environmental factors. Consequently, we must assume that employment opportunities are one of the most striking elements differentiating the two regions. This would seem reasonable as unemployment rates diverge quite significantly based on consideration of university graduates in the age class 25-34 and unemployment rates in the fourth quarter of 2007 of 3.6% in the North, 8.4% in the Centre, and 18.8% in the South of Italy (Istat, 2008).

Θ_3 Employment opportunities are differentiated by type of activity. In a dual economy in the lagging region there are relatively fewer job opportunities for locals with technical or scientific education, because of the sectoral composition (industry mix) of the area and the small size of the manufacturing sector. The opportunities in the developed region, in contrast, are relatively greater. We expect that graduates from scientific and technical disciplines, such as chemistry and physics, or engineering and medicine, will be more likely to emigrate from the South compared to their counterparts from disciplines such as the humanities or social studies.

Hypotheses 1-3 are fully consistent with the notion of migration as an investment decision. Even if only a subset of these hypotheses is empirically verified, the notion still holds. However, contrasting empirical evidences has been interpreted by some scholars as an alternative mechanism that induces migration. The main idea, summarised in the phrase "Not a choice, but a necessity", is that the migration of recently university graduates from the South of Italy is driven not by higher salaries, but is being forced by a shortage of suitable employment opportunities. This will be proved if we find a negative correlation between migration and wage (see, for instance, D'Antonio and Scarlato, 2007). This approach, which neglects the relationship between the employment perspectives in the wider labour market and educational choices, raises additional questions about negative wage differentials. If we (quite reasonably) exclude discrimination among Italians and low degree of interregional human capital transferability, the residual explanation should be negative self-selection based on the individual characteristics of potentially mobile people. This hypothesis, which has been proposed in international migration studies (Chiswick and Miller, 2008), contrasts with the view that the most talented people are more likely to migrate because they have the highest chances of receiving higher incomes. This leads to our fourth hypothesis.

Θ_4 If self-selection exists, it is positive self-selection: the most brilliant graduates are more mobile in general and the most likely migrants from the South. University performance, as measured by the final degree grade or honour (*cum laude*) awarded, can be considered a proxy for individual talent.

Θ_5 In contrast to international migration, which in some cases is strongly characterised by a prevalence of one of the sexes (male or female), some initial stages, at least, interregional migration within western countries of young well educated people appears less sensitive to gender. This hypothesis holds for the South of Italy, where traditional constraints and attitudes with respect to women are gradually disappearing and no longer apply in the most educated and urban social classes. However, unemployment rates among young people in the Mezzogiorno are not only high (15.9% in the fourth quarter of 2007 for people aged 25-34 years, regardless of the level of education (Istat, 2008), but are particularly high in the case of women (20,9%). Unfortunately, we have not been able to obtain unemployment rates differentiated by gender, age, level of education and region, in order to ascertain whether gender is a factor in the group of recently university graduates. Accordingly, we have no *ex-ante* expectation about the sign or the significance of this variable, which will be tested empirically.

Θ_6 Several sociologists have emphasised the role of the family in affecting education choice and social mobility, and not only in Italy. In the South of Italy, where family ties are still very important, it especially applies. Less well investigated has been the question of environment in terms of whether a well educated family exerts an influence on the migration propensity of young graduates and whether parents' occupation and/or professional position play a role. These aspects might play in opposite directions: on the one side, promoting greater openness and greater ability to face new circumstances, and on the other, providing a local nexus based on rootedness within social networks established around parents' jobs (in some cases, providing jobs directly related to the parents' occupation or within a family business).

Θ_7 Based on the relevance of formal and informal channels in finding employment, we can hypothesise that the greater the family's and individual's local embeddedness and the greater the ability to benefit form informal relationships, the higher will be the likelihood of finding a job locally, and the lower will be the likelihood of migration. This argument will be considerably stronger in relation to areas such as the Italian Mezzogiorno where the shortage of employment opportunities combined with non-market rules in many businesses make job-searching a process in which the better connected people will be more likely to succeed, and the less well connected will be more likely to be unsuccessful.

3. Data and methodology

3.1 The data-set

Our analysis is based on micro-data provided by the Italian National Statistical Institute (Istat, 2005)[1]. The dataset was derived from a phone survey (CATI – Computer Assisted Telephone Interview) carried out in 2004 using a sample of individuals that graduated from an Italian university in 2001. It aimed at being representative of every university and type of degree (for instance, engineering, medicine, etc.) considered jointly.

The purpose of the survey was to explore how graduates enter the labour market and thus the dataset contains data on the transition from university to the workplace, including information on curricula, characteristics of the job, the process of job-search and the graduates' socio-economic background. The time lag between graduation and employment was fixed at 3 years; thus the data need to be interpreted as indicating the position of graduates 3 years after graduation.

The sample is drawn from a population of over 150,000 persons who graduated from an Italian university in 2001; of these, only a small minority had followed the newly introduced three-year degree curriculum, the majority having followed the traditional pre-riforma curriculum.

The sample of interviews numbers 26,006 and is stratified by sex, university and type of degree. The empirical investigation involved a sub-sample of 16,008 units, that is, those graduates that were in employment in 2004. This database is accessible at Istat's "Adele" laboratory of Istat; the procedure allows for the inclusion of potentially sensible information (such as region of residence at time of enrolment at the university), unlike the dataset that can be purchased where such information is excluded for reasons of privacy.

3.2. The modeling strategy

In order to empirically test the impact of different sets of explanatory variables on the probability of interregional migration of university graduates we use a discrete choice Probit model such as:

$$\Pr\left(Y = 1 \middle| X = z\right) = \Theta\left(z'\beta\right)$$

where Θ is the cumulative distribution function of the standard normal distribution, and $z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_k x_k$. The unknown coefficients β are estimated using a robust maximum likelihood estimator. This allows us to control for potential heteroschedasticity problems.

[1] This is the most up to date survey available; it is part of the "Graduates transition into the job market" plan, which undertakes this type of investigation every 3 years. The most recent survey (2007) is not yet available to users.

From an operational point of view, we use the procedure *dprobit* by Stata. Rather than reporting coefficients, this procedure reports an estimated marginal effect of the probability of an infinitesimal change in each independent, continuous variable at its mean value and, by default, a discrete change in the probability of the dummy variables. This allows us to interpret both the "size" and the sign of the estimated coefficient.

From an econometric point of view, two aspects are important. First, our estimates should be interpreted as the outcome of a correlation analysis rather than a causal relationship between the dependent and the explanatory variables. In other words, our econometric investigation should taken as being descriptive, and not regarded as a causality test. One way around this would be to use a pseudo-panel data-set; however, there are no data-sets of this type currently available. Second, we are not able to control for unobserved hetereogeneity. Nevertheless, the introduction in the baseline specifications of variables for individual characteristics such as gender, region of residence, and so on should allow us to deal with these phenomena.

4. Some stylised facts

During the second half of the 1990s, internal mobility increased noticeably, peaking in 2000. Internal migration flows at regional level are multi-directional, but for the regions of the Mezzogiorno the balance is steadily negative (Fig. 1).

There are several factors that have acted to enhance migrations from the South, and the most frequently quoted being the youth unemployment differential, which increased from 18.6% at the beginning of the 1990s to 27.4% at the end of the decade (Banca d'Italia, 2005b).

Out-migration from the South mainly involves young adults (20-29 years old); for those aged 55-69 years, the balance becomes positive (Svimez, 2007). What is, even more noticeable, is that some 25% of out-migration between 1997 and 2002 involved university graduates, compared with an average of 7% for the whole of the population in the South (Banca d'Italia, 2005a).

If we compare the shares of university graduates in the different macro-areas of Italy, the South shows only very small differences (Table 1). However, it shows some striking differentials if we consider distinct age cohorts (Fig. 2).

This evidence is even more remarkable when we note that over the last 15 years the number of university graduates in the South has quadrupled and the gap with the rest of the country in terms of

university enrolment rates[2] has been closed. It seems that the South is unable to increase employment opportunities for its young graduates.

Table 2, referring to a sample of 16,008 university graduates in 2001 who were in employment three years later, provides clear evidences of the size of the phenomenon and presents the different patterns of graduates internal migration.

The three key spatial variables are place of residence at the time of university studies, or more precisely initial enrolment at the university; location of the university; current (2004) employment location. Locations are identified with regions related to the four macro-areas of the Italian territory: North-West (NW), North-East (NE), Central (CE) and South (SO) or the Mezzogiorno. Hereafter, the term region designates each macro-area.

A southern graduate is a graduate who was resident in the South at the time of university enrolment, regardless of the location of the university chosen; this differentiation applies to graduates from the other three regions.

A migrated graduate is an individual whose region of residence has changed, that is, change of location from place (region) of residence at time of enrolment in a university to region of current (2004) employment. We do not consider migration between the administrative regions (NUTS2) within the previously defined macro-areas or regions (for instance, relocation from Piedmont to Lombardy, within the NW).

The second column in Table 2 shows the size and composition of the sample in terms of region of residence (bottom block). About 30% of the sample are southern graduates.

The first two blocks different between those who enrolled in a university in their region of residence, and those who 'migrated' to study in a different region. About 12% of the sample chose universities outside their regions of residence: this low share reflects the national tendency to choose a university close to home, mainly to save on costs of living away. However, this tendency is lower in the South, where the 22% of the sample moved to another region to attend university: this is about three times the share for NE and CE and two and a half times the share for NW: hence, we can say that people in the South show a higher propensity to emigrate for study than their counterparts in the other three areas of the country.

[2] The number of southern university graduates was 27,830 in 1990, 113,280 in 2005 (+307%); over the same period, in the rest of the country graduates grew from 61,651 to 188,018 (+205%). Enrolment rates of southern residents were 25.1% in the academic year 1990/91 and 42.8% in 2005/06; for the rest of the country, enrolment rates increased from 34.1% to 40.0% (Svimez, 2007).

The right hand column shows the proportion of graduates that are employed in 2004 in the region where they previously lived. Over the four macro-areas, less than 15% migrated from their region of origin, but this share more than doubles in the case of southern residents to reach (30.9%) which points to an interregional brain drain. This is the second relevant finding.

Moreover, this level is the average propensity to move for those that graduated from a university located in the South (29.2%), and of those who had already migrated to attend university. The former group is about four times bigger than the latter; thus in the case of the latter group, the propensity to find a job outside their region of origin is still higher (37.0%) and even more worrying. This third finding confirms the existence of two distinct paths of emigration from the South, as universities, directly or indirectly, can facilitate entry to the local labour market. Even though this relates to only a minor proportion of southern graduates, it accounts for more than a quarter of total university graduate emigration.

A corollary to this finding is that it would be useful to compare the two types of out-migrating graduates, that is, those who studied within their region of origin and those who did not. It would also be interesting to compare the numbers of those who studied outside the South, but subsequently returned, and those that did not (yet?).

5. Empirical results

The analysis highlights some characteristics of interregional migration patterns at the aggregated level. The aim of this section is to empirically identify those variables that could explain these phenomena at the individual level. Use of the conditional is deliberate, as the econometric analysis is based on cross-sectional data and is not well-suited to establishing the exogeneity of the independent variables. It follows that the main outcomes should be interpreted as correlation structures of the data, and that for the great majority of explanatory variables, exogeneity is assumed rather than being empirically tested.

For the above sample of university graduates that were employed in the year 2004, we estimate a discrete choice *Probit* model. More specifically, we estimate maximum-likelihood *probit* models, using the Stata procedure *dprobit*. Rather than reporting coefficients, this procedure produces estimates of marginal effects on the probability for an infinitesimal change in each independent, continuous variable at its mean value and, by default, the discrete change in the probability for dummy variables.

The dependent variable is the probability of interregional migration, as previously defined, captured by a dummy variable which takes value 1 if the i^{th} unit, i= 1,2 … 16,008, has actually emigrated from the region of early residence and 0 otherwise.

There are three groups of explanatory variables: (i) individual characteristics (gender, region of residence, type of degree, university performance represented by graduation mark; current monthly net wage; sector of activity); (ii) family background (parents' education levels and types of activity); (iii) information on the channel of access to job, that is, how graduates actually found their jobs, which represents a critical aspect of the social context.

The main empirical results are reported in Tables 3-4. The former contains two models based on the individual characteristics, the latter takes account of the family background and the social context. Tables 5-6 replicate these models for the sub-sample of southern graduates.

Model 1 for the entire sample (Table 3) is exclusively based on dummy variables and clearly shows the "South effect" on interregional mobility. When controlling by type of studies and sex only, the probability of migrating is 27.3 percentage points higher compared to Centre residents and even higher for residents in Northern regions (36.9-40.1 pps). This effect increases slightly as additional explicative variables are introduced, as in models 2-4.

Gender is significant, but plays a negligible role. Type of studies matters a lot: graduates in scientific disciplines, such as natural sciences, maths, physics and chemistry, geology and biology, and technical disciplines such as medicine and engineering (but not architecture, where graduates are less mobile), show an extremely higher propensity to move, followed by agronomists and graduates in social science disciplines such as economics, business, statistics and politics. Graduates in humanities and law have very low propensity or opportunity to move, but the least mobile are graduates of education and psychology. This pattern is reinforced in the sub-sample of Southern graduates (Table 5). Among this group, the probability of emigrating dramatically increases in the case of graduates in scientific disciplines (but not the natural sciences) and medicine, where it is extremely difficult for the local economy to absorb this qualified workforce. Also graduates in economics and statistics show very much higher propensities to emigrate. In contrast, the slight increases in emigration on the already low marginal effects for humanities disciplines, law, etc. demonstrate there are more local job opportunities for these types of graduates. There is also a stronger preference for these disciplines: 23.3% of southern graduates studied law compared with a share of 7.4% nationally and 47.4% studied the humanities or psychology compared with 14.8% nationally. On the other side, as expected in the most technological or scientific field, such engineering and chemistry, there is an extremely low share of graduates in the southern sample, 4.1% and 0.8% respectively, compared to the national average as represented by the entire sample (16.5% and 6.1%). It follows that the South produces fewer graduates in these disciplines, and it loses a relevant portion of this total because there are few local job opportunities. This suggests

that there are two components to this loss of graduates from the area: a qualitative one, which refers to the small numbers graduating in science and technology disciplines who have a high propensity to move; and a quantitative one, which refers to the majority of graduates (in law and in the humanities), who are less inclined to move, but that determine the migration balance.

Model 2 includes two explanatory variables, a proxy for university performance captured by final degree grade (complemented by a dummy variable which equals 1 in case of graduation with honours), and the current (2004) monthly net salary of the worker. Both variables are in natural logarithm and the estimated marginal effects can be considered as an "elasticity" (at the corresponding mean values).

Model 2 for the entire sample (Table 3) shows that both variables are positively correlated with the probability of migration in a significant way (except for "cum laude"). The best graduates are more likely to migrate and migration is accompanied by a salary premium (as far as the elasticity is positive). The marginal effects for all the previous variables except gender do not change, when the new ones are taken into account. The marginal effects for these new variables dramatically increase once again for the Southerners sub-sample (Table 5). This adds new qualitative aspects to out-migration. First, the best graduates are more likely to leave the South than lower profile graduates. Second, the effect due to higher than average salary elasticity, suggests that a lower salary premium has the effect of increasing migration from the South compared to the rest of the country. This latter evidence raises the question of the additional (non monetary) benefits gained by southern migrants get, and introduces possible social issues.

Models 3 and 4 include two sets of variables related to family background and prospective effects of social networks respectively.

It would seem reasonable to assume that a positive family background (educated parents) will be more open and sympathetic to opportunities in other regions. This could enhance the attitudes of their offspring toward labour spatial mobility. Parents are likely to receive higher earnings, the offspring of more wealthy families are more likely to undertake their studies in another city or in another region. Again, this will likely enhances attitudes toward spatial mobility. These perhaps over, hypotheses are not corroborated by the data (model 3, Table 4): the probability of migration does not appear be related to the parents' education levels, except in the case of mothers with a first university degree (or higher). This result is confirmed by the southern sub-sample (model 3, Table 5), where the variable for mother with a high school degree is positively correlated, and the variable for father with a university degree is negatively correlated with migration likelihood, although both are at low levels of statistical significance. Migration propensity does not appear to be related to parents' occupation; several attempts were made

to find a correlation structure, but neither the position nor and the sector of mother's and father's occupations contribute to explaining attitudes to migration. Sociologists have discussed the role of the mother in influencing their son's school performance; and shown it to be positive. Rather surprisingly, the role of the father is not significant in explaining mobility, except for fathers with university degrees and living in the South: however, the negative sign associated with the dummy variable suggests that this inhibits rather than boosting mobility, which is probably due to a social network effect that could support the local recruitment of the sons of professional people.

The role of social factors in labour mobility can be explored by considering the main channels through which young graduates find jobs. Some are based on informal social networks while others are less identifiable and are based on market institutions. A list of access channels is provided in Table 7, which shows the shares of respondents in the national sample and the southern sub-sample, and the sign of the corresponding significance estimates in model 4 in Tables 4 and 6 (model 4 being the best model proposed).

Table 7 – Channel to find a job

Code	Channels	National sample %	South only %	National sample	South only
1	Direct knowledge of the employer*	7.1	7.4	-	-
2	Recommendation of friends or family member*	12.4	11.5		-
3	Recommendation from the university or university professor*	5.3	4.1	-	
4	To gain further training in a firm	6.5	5.9	+	+
5	Direct recruitment by the employer	5.7	4.4		-
6	Advertisements in the media (newspapers and internet)	9.3	10.5	+	+
7	Sending CV to potential employers - search for a direct contact	27.8	27.1	+	
8	Open competition	11.8	12.9		
9	Starting a new business*	6.1	7.8	-	-
10	Collaborating in a family business*	1.7	2.0	-	-
11	Public employment agencies	1.1	1.4		
12	Private placement agencies	2.0	2.0	+	+
13	Other	3.2	3.0		

* assigned to informal networks

From the share of respondents for each item (and assuming that responses were truthful), it can be seen that there is no significant difference between the South and the rest of Italy. Also social-informal networks have approximately the same weight for both samples, accounting for about one third. Traditional formal channels normally associated with the South such as open competition (public competition) are weighted only one percentage point more than the rest of the country, while other market oriented channels such as sending out CVs, responding to advertisements in the newspaper,

show no differences between the South and the rest of Italy. Joining the family business and using public and private recruitment agencies seem to have very small effects, while starting up a new activity is more important – and even more so in the South. In some cases, this should be interpreted as a temporary and second best solution to remaining unemployed.

The different channels used to find jobs show a predictable relation with attitudes to migration. Those associated more with informal knowledge networks have a negative sign, while the others have a positive sign; but not all the variables are significantly correlated with the probability of migrating. Focussing on this aspect, it is interesting to note that the recommendations of friends or family members – which reduce likelihood of migration – are significant in the southern sub-sample, but not in the national one; sending CVs to potential employers – which increases the likelihood of migration – is significant for the whole sample, but not the South sample. In addition, "direct knowledge of employer" triples the marginal effect in the South with respect to the entire sample, that is, in the South there tends to be more knowledge about local employers. Finally, "starting a new business" and "collaborating in a family business" seem to have marginal negative effects, which are definitely higher in the South.

These results suggest that people that are well integrated in social networks have less incentives to move away from the South, as direct relationships, direct and indirect knowledge about employers and family support, eases the entry to the labour market and increases the chances of finding a job locally. These determinants are stronger in the South compared to the country as a whole.

So how do these factors affect the group of southern graduates that studied outside their region of origin. As already shown, this group is less to return to the South and about the 37% of them migrated to other regions for employment.

Table 8 presents the best model for the likelihood of returning.

The probability is not independent of region in which the university is located; those who studied in the North-West of the country (especially Lombardy) are less likely to return.

A critical determinant of a graduate's returning to the South is grade; better university performance greatly reduces the chance of returning, while the reverse is also true, that is that the worst graduates are more likely to return to the region. With the exception of architecture, and politics and social science, type of degree does not play a significant role. Among this group of graduates, the father's profile is interesting: in particular, sons of artisans, farmers and skilled and semiskilled blue collar workers (*Profession father_p6/7*) are less likely to return; as are those graduates whose fathers have a university degree (*Education father_6*). On the other hand, the existence of a family business increases the probability of coming back. These outcomes would seem plausible in view of the importance of non-

market relations; for instance, blue collar workers have less opportunity to support entry of their graduate offspring into the local labour markets compared to parents in clerical or professional positions, where social (selective) networks have an effect. Consequently, their sons will be less likely to return.

6. Conclusions (rough draft)

We can say that in the South generally there is a shortage of job opportunities (see aggregated data), which is accompanied by qualitative mismatch of available labour (see the variance of shift coefficients for different university degree). The latter and a higher elasticity to wage premiums and a higher elasticity to mark degree and a relevance of social mechanism which can act discriminatory (in alternative to market) show that migration from the South cannot be predicted by simple models (such as wage differentials).

In terms of policy, raising education levels increases the job prospects for young graduates (especially if they move?). Thus, increasing education is likely to increase mobility – especially of the best graduates – which can result in a lagging region becoming more lagging (see Huang *et al.*, 2002 and Arts, 2003). They showed that increased human capital through education may reduce growth in rural US areas, enhancing a brain drain phenomenon in favour of amenity-reach areas. So do investments in human capital accompany or promote growth? Might their effects be ambivalent under what conditions?

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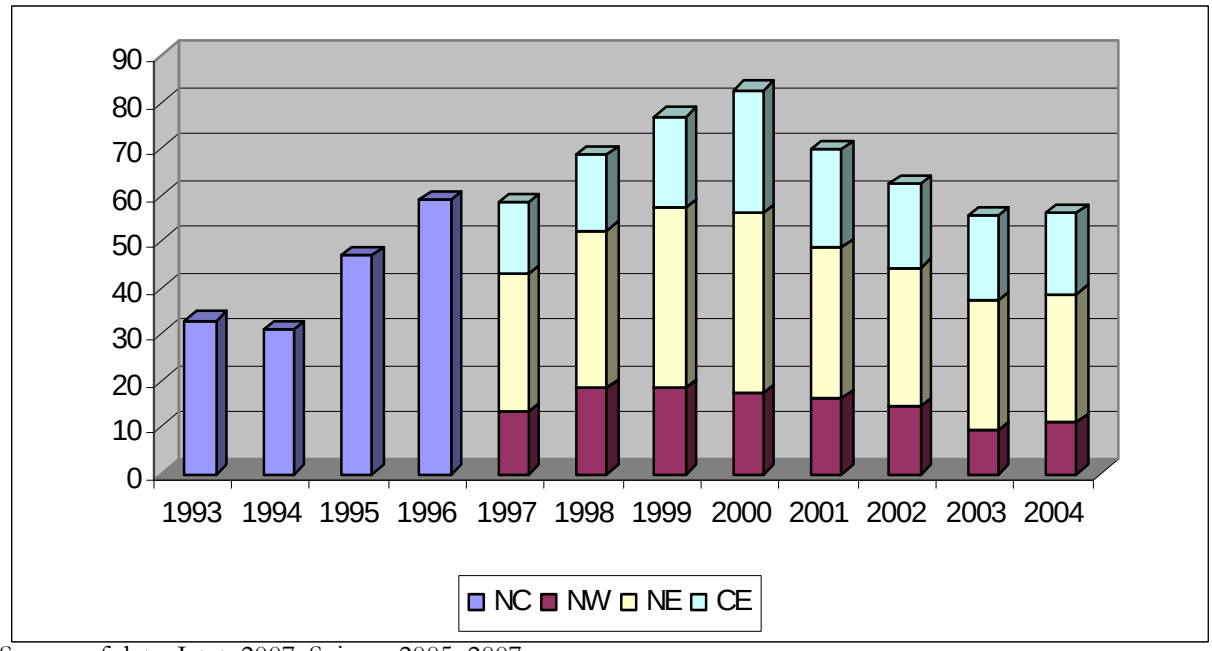
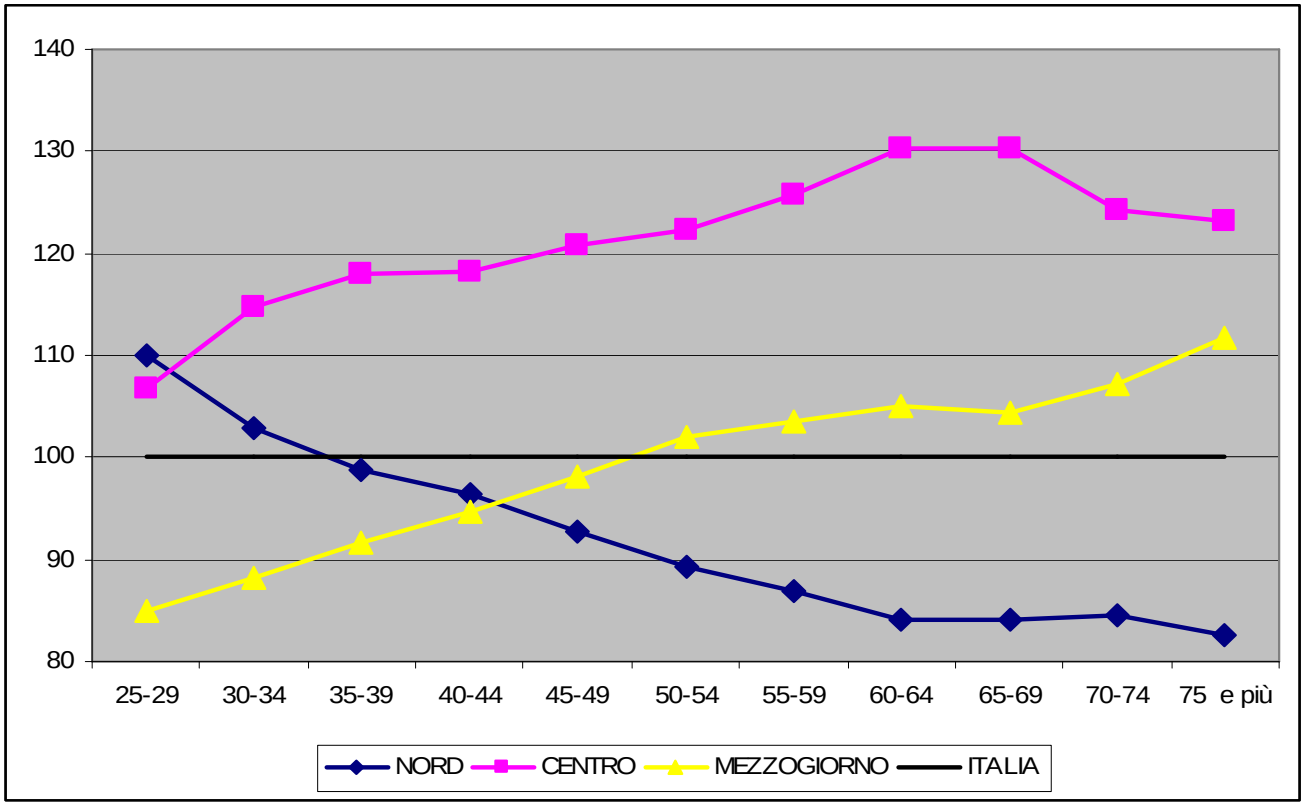
Fig. 1 – Internal migratory balance for the Italian macro-areas (corresponding to the reverse balance for the South) (thousands)



Source of data: Istat, 2007; Svimez 2005, 2007

Fig. 2 – Territorial differentials in higher education rates by age cohort (Italy =100), 2001



Source of data: Istat, 2005b

Table 1 – Share of university graduates, 2001

Age	NW	NE	CE	SO	ITA
≥ 20	7,4%	7,0%	9,0%	7,2%	**7,6%**

Source: Istat, 2005b

Table 2 – Patterns of mobility

University enrolment in the region of residence at the time	Region of residence at university enrolment			Currently employed in the same region of residence as at university enrolment		
	N	%	Area	YES	NO	% NO
YES	4.066	91%	NW			
	3.011	93%	NE			
	3.232	93%	CE			
	3.750	78%	SO	2.657	1.093	29,2%
	14.059	88%	tot			
NO	401	9%	NW			
	242	7%	NE			
	252	7%	CE			
	1.054	22%	SO	664	390	37,0%
	1.949	12%	tot			
TOT	4.467	28%	NW	4.288	179	4,0%
	3.253	20%	NE	3.021	232	7,1%
	3.484	22%	CE	3.062	422	12,1%
	4.804	30%	SO	3.321	1.483	30,9%
	16.008	100%	tot	13.692	2.316	14,5%

Table 3 – Probability of interregional migration

Estimation Method: Probit	*Model 1*		*Model 2*	
	dF/dx	*t values*	*dF/dx*	*t values*
Gender (male=1)	0.010**	2.06	0.0005	0.10
Res. at time of university registration North-West	-0.128**	-9.81	-0.127**	-9.42
Res. at time of university registration North-East	-0.096**	-7.99	-0.093**	-7.28
Res. at time of university registration Centre	Ref.	Ref.	Ref.	Ref.
Res. at time of university registration South	0.273**	21.84	0.289**	21.63
Degree natural sciences (01)	0.441**	11.07	0.444**	10.51
Degree chemistry (02)	0.456**	10.58	0.468**	10.33
Degree biology (03)	0.424**	9.27	0.424**	8.73
Degree medicine (04)	0.477**	13.80	0.477**	13.04
Degree engineering (05)	0.492**	13.98	0.488**	13.10
Degree architecture (06)	0.291**	8.20	0.302**	7.95
Degree agriculture (07)	0.371**	9.54	0.376**	9.11
Degree economics and statistics (08)	0.383**	11.91	0.390**	11.40
Degree politics and social sciences (09)	0.391**	11.24	0.398**	10.74
Degree law (10)	0.159**	6.00	0.178**	6.19
Degree literature (11)	0.178**	6.24	0.186**	6.11
Degree foreign languages (12)	0.165**	5.58	0.180**	5.68
Degree education (13)	0.124**	4.21	0.131**	4.14
Degree psychology (14)	0.063**	2.07	0.073**	2.22
Degree physical education and defence-security (15 and 16)	Ref.	Ref.	Ref.	Ref.
Ln (final grade)	…	…	0.107**	2.33
Honours (yes=1)	…	…	0.0006	0.08
Ln (net monthly income)	…	…	0.077**	10.55
N. Obs.	16,008		14,707	
Pseudo R^2	0.158		0.174	
Obs. P	0.144		0.147	
Predicted probability of a positive outcome	0.113		0.112	

Regressions also include a constant term; ** significant at 5%; * significant at 10%

Table 4 –Probability of interregional migration

Estimation Method: Probit	*Model 3*		*Model 4*	
	dF/dx	*t values*	*dF/dx*	*t values*
Gender (male=1)	0.0003	0.06	…	…
Res. at time of university registration North-West	-0.123**	-9.13	-0.122**	-9.13
Res. at time of university registration North-East	-0.089**	-7.03	-0.088	-7.05
Res. at time of university registration Centre	Ref.	Ref.	Ref.	Ref.
Res. at time of university registration South	0.291**	21.77	0.289**	21.68
Degree natural sciences (01)	0.432**	10.25	0.435**	10.28
Degree chemistry (02)	0.451**	10.01	0.446**	9.86
Degree biology (03)	0.413**	8.51	0.404**	8.31
Degree medicine (04)	0.466**	12.78	0.456**	12.53
Degree engineering (05)	0.481**	12.90	0.472**	12.66
Degree architecture (06)	0.300**	7.91	0.302**	7.94
Degree agriculture (07)	0.370**	8.99	0.382**	9.17
Degree economics and statistics (08)	0.382**	11.19	0.375**	11.04
Degree politics and social sciences (09)	0.386**	10.45	0.380**	10.36
Degree law (10)	0.166**	5.86	0.160**	5.73
Degree literature (11)	0.182**	6.01	0.173**	5.81
Degree foreign languages (12)	0.173**	5.49	0.178**	5.68
Degree education (13)	0.124**	3.94	0.119**	3.87
Degree psychology (14)	0.069**	2.11	0.070**	2.15
Degree physical education and defence-security (15 and 16)	Ref.	Ref.	Ref.	Ref.
Ln (final grade)	0.100**	2.18	…	…
Honours (yes=1)	-0.002	-0.27	…	…
Ln (net monthly income)	0.076**	10.41	0.079**	10.52
Education mother_3	-0.010	-1.29	…	…
Education mother_4	0.014	1.60	…	…
Education mother_5	0.021	0.79	…	…
Education mother_6	0.041**	3.30	0.040**	5.10
Education father_3	0.005	0.59	…	…
Education father_4	0.013	1.40	…	…
Education father_5	-0.036	-1.11	…	…
Education father_6	0.006	0.57	…	…
Sector of activity agriculture	…	…	-0.034*	-1.77
Channel of access to the labour market_1	…	…	-0.042**	-3.89
Channel of access to the labour market_3	…	…	0.031**	2.44
Channel of access to the labour market_4	…	…	0.053**	4.65
Channel of access to the labour market_6	…	…	0.079**	7.74
Channel of access to the labour market_7	…	…	0.018**	2.76
Channel of access to the labour market_9	…	…	-0.067**	-5.97
Channel of access to the labour market_10	…	…	-0.099**	-5.09
Channel of access to the labour market_12	…	…	0.050**	2.62
N. Obs.	14,594		14,663	
Pseudo R^2	0.178		0.197	
Obs. P	0.147		0.147	
Predicted probability of a positive outcome	0.111		0.106	

Regressions also include a constant term; ** significant at 5%; * significant at 10%

Table 5 – Probability of interregional migration (only southern graduates)

Estimation Method: Probit	*Model 1*		*Model 2*	
	dF/dx	*t values*	*dF/dx*	*t values*
Gender (male=1)	-0.021	-1.48	-0.050**	-3.16
Degree natural sciences (01)	0.451**	7.24	0.436**	6.52
Degree chemistry (02)	0.629**	8.09	0.620**	7.76
Degree biology (03)	0.669**	6.32	0.652**	5.66
Degree medicine (04)	0.669**	14.00	0.661**	12.83
Degree engineering (05)	0.567**	12.10	0.572**	11.47
Degree architecture (06)	0.412**	7.28	0.414**	6.76
Degree agriculture (07)	0.548**	8.11	0.555**	7.96
Degree economics and statistics (08)	0.618**	15.08	0.635**	14.63
Degree politics and social sciences (09)	0.326**	7.26	0.340**	7.09
Degree law (10)	0.218**	5.71	0.245**	5.91
Degree literature (11)	0.251**	6.19	0.262**	6.00
Degree foreign languages (12)	0.251**	5.88	0.278**	6.02
Degree education (13)	0.175**	3.98	0.189**	3.94
Degree psychology (14)	0.080*	1.65	0.092*	1.74
Degree physical education and defence-security (15 and 16)	Ref.	Ref.	Ref.	Ref.
Ln (final grade)	…	...	0.431**	3.32
Honours (yes=1)	…	...	-0.019	-0.96
Ln (net monthly income)	…	...	0.182**	9.92
N. Obs.	4,804		4,345	
Pseudo R^2	0.119		0.139	
Obs. P	0.308		0.322	
Predicted probability of a positive outcome	0.293		0.302	

Regressions also include a constant term; ** significant at 5%; * significant at 10%

Table 6 – Probability of interregional migration (only southern graduates)

Estimation Method: Probit	*Model 3*		*Model 4*	
	dF/dx	*t values*	*dF/dx*	*t values*
Gender (male=1)	-0.048**	-3.01	-0.027*	-1.73
Degree natural sciences (01)	0.427**	6.29	0.371**	5.86
Degree chemistry (02)	0.618**	7.74	0.606**	7.40
Degree biology (03)	0.646**	5.40	0.657**	4.81
Degree medicine (04)	0.658**	12.59	0.667**	12.84
Degree engineering (05)	0.572**	11.31	0.542**	11.89
Degree architecture (06)	0.411**	6.71	0.397**	6.94
Degree agriculture (07)	0.541**	7.54	0.567**	7.97
Degree economics and statistics (08)	0.633**	14.40	0.621**	16.23
Degree politics and social sciences (09)	0.333**	6.89	0.283**	7.26
Degree law (10)	0.237**	5.68	0.186**	5.96
Degree literature (11)	0.259**	5.91	0.203**	6.02
Degree foreign languages (12)	0.271**	5.83	0.238**	6.48
Degree education (13)	0.181**	3.78	0.132**	3.42
Degree psychology (14)	0.086*	1.63	Ref.	Ref.
Degree physical educ., defence and psychology (14, 15, 16)	Ref.	Ref.	Ref.	Ref.
Ln (final grade)	0.418**	3.21	…	…
Honours (yes=1)	-0.021	-1.05	0.185**	9.09
Ln (net monthly income)	0.183**	9.79	…	…
Education mother_4	0.040*	1.99	…	…
Education mother_5	0.129	1.26	0.065**	3.06
Education mother_6	0.099**	3.43	…	…
Education father_4	0.002	0.12	…	…
Education father_5	-0.110	-1.21	…	…
Education father_6	-0.047*	-1.84	…	…
Channel of access to the labour market_1	…	…	-0.193**	-7.44
Channel of access to the labour market_2	…	…	-0.075**	-3.31
Channel of access to the labour market_4	…	…	0.158**	4.86
Channel of access to the labour market_5	…	…	-0.069**	-2.07
Channel of access to the labour market_6	…	…	0.134**	5.42
Channel of access to the labour market_9	…	…	-0.252**	-9.26
Channel of access to the labour market_10	…	…	-0.287**	-6.09
Channel of access to the labour market_12	…	…	0.130**	2.39
N. Obs.	4,315		4,335	
Pseudo R^2	0.142		0.198	
Obs. P	0.321		0.322	
Predicted probability of a positive outcome	0.301		0.281	

Regressions also include a constant term; ** significant at 5%; * significant at 10%

Table 8 – Determinants of returning (only Southern graduates)

Estimation Method: Probit	*dF/dx*	*t values*
Ln (final grade)	-0.691**	-3.14
University North-West	-0.202**	-4.18
University North-East	Ref.	Ref.
University Centre	-0.067**	-1.60
Degree architecture (06)	0.258**	4.70
Degree politics and social sciences (09)	0.215**	3.56
Education father_6	-0.104**	-2.42
Profession father_p2.6	0.187**	2.76
Profession father_p6	-0.111**	-2.52
Profession father_p7	-0.151**	-2.32
Channel of access to the labour market_1	0.212**	3.36
Channel of access to the labour market_3	-0.240**	-3.26
Channel of access to the labour market_4	-0.199**	-2.90
Channel of access to the labour market_6	-0.166**	-3.08
Channel of access to the labour market_9	0.354**	5.80
Channel of access to the labour market_10	0.566**	4.84
N. Obs.	1,044	
Pseudo R^2	0.147	
Obs. P	0.369	
Predicted probability of a positive outcome	0.350	

Regressions also include a constant term; ** significant at 5%; significant at 10%