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EDUCATION AND MIGRATION: THE MOBILITY DYNAMICS OF ITALIAN GRADUATES

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Abstract. *Much is told in the literature about the determinants that lead graduates to migrate. However, it is crucial to understand how these dynamics have changed after the new worldwide financial crisis: nowadays, inequality has increased, and new generations tend to travel much more than the previous ones, being more prone to look for better opportunities in a different city or country. In this paper, after a brief introduction on the importance of the study and of the various research in the field, we present a Probit regression model to explain the most important determinants of graduates' migration. We found that life experience, family background and economic factors can explain the willingness to move, and that graduates from southern Italy have an extremely higher probability to move to a different geographical area to look for a job, with respect to Italians of northern regions, while the graduation mark does not lead to significant differences in the probability of migrating.*

Keywords*: Human capital mobility, Labor market, Internal migration, Brain drain.*

1. INTRODUCTION

Many graduates, in recent years, are about to cross regional or national borders to work, aiming to catch better opportunities than they could do in their place of origin (Cantwell et al., 2009; Mayda, 2010). It is a common assumption in the economic literature that human capital mobility is beneficial for the society and that, being a form of human capital investment, it generates more economic growth in a country (Lucas, 1988). Through migration, for example, graduates can acquire more knowledge and experience, increasing their stock of human capital (Faggian and McCann, 2009). Moreover, in the neoclassical Solow-Swan model (Solow, 1956; Swan, 1956), migration is an adjustment mechanism that generates economic growth, rebalancing the regional differences. On the other hand, brain drain can be particularly damaging for a developed country.

The dynamics of graduates' mobility have important implications, especially in policy terms. The loss of human capital due to emigration results in a reduced growth rate of income per worker in the sending country (see Romer, 1996). However, it is the loss of graduates, being them very important for research and technology development, to be particularly damaging for a developed country (Becker et al., 2004). In Italy, fortunately, various data are provided about the mobility dynamics of graduates, due to the need for government bodies to evaluate the quality of services offered by Italian universities. In 1994, the Almalaurea Interuniversity Consortium was established, with the aim of promoting the inclusion of young graduates in the workplace. Since 1998, Almalaurea surveys the profile and employment status of graduates, publishing updated studies every year.

In this paper, following Bacci and Chiandotto (2007), we study graduates' work-related mobility patterns assuming that, considering the other conditions as constant, looking for a job in a close place is usually preferable, and that mobility choices for labor purposes are based on both economic and social-psychological motivations.

The paper is structured as follows: in Section 2, we develop a critical discussion about the existing literature on the topic, discussing about the determinants of mobility and presenting some data about migration in Italy. In Section 3, we present the data used, and the properties and specifications of our model. In Section 4, we show our empirical results and comments; then, in the final Section (5), we give some policy implications and concluding remarks.

2. THE MOBILITY DETERMINANTS: STATE OF ART

In the literature, there are several studies about Italian graduates, focusing on their employment status or on the use of the skills developed at university (Chiandotto and Bacci, 2004; 2007; Chiandotto et al., 2007). A flourishing literature on students' and workers' mobility has also recently emerged (e.g. Bacci et al., 2008; Ciriaci, 2014). Several factors can influence mobility choices, of both students and graduates. In the economic and sociological literature, the influence of the place of origin's economic framework is well known: if'it'is not favorable, it pushes for mobility (Mayda, 2005; Marinelli, 2013). This happens when there are no opportunities, or very few of them, in the place of origin: e.g., youth unemployment is high, there are no openings in the field in which they are specialized, wages are low, or other social and economic reasons. Therefore, the determinants of graduates' mobility mainly lie on the unbalance between social and economic attributes of the region of origin and the one of destination. According to this assumption, several studies showed interesting empirical evidences. For example, Dotti et al. (2013) assess the importance of employment rate for both the region of origin, and the one of destination. Moreover, the dynamics of migration have changed after the 2008

economic crisis, and some recent studies give attention to these differences (see e.g. Vasile, 2012; Aassve et al., 2013).

Recent data of Italian graduates' mobility confirm these considerations. In 2004, before the crisis, 35.4% of the southern graduates worked in a different geographical partition (i.e. center or north of Italy) than the graduation one. Vice versa, only 14.3% of graduates from central Italy moved from their partition to another one (especially to the north of Italy). At the same time, in the north only 5.5% of graduates left their geographical partition (Almalaurea, 2005). Five years later, in the middle of the crisis, these differences increased. Moreover, while a high number (93%) of graduates from northern Italy did not leave their partition, a relevant 3% of them went outside Italy. In central Italy, 16% of graduates went away, especially to the north of Italy. In the south, however, 40% of graduates left their regions to other parts of Italy, looking for better opportunities. As the data show, the most important flows of human capital in Italy are directed to the north, the richest part of the country (Almalaurea, 2010). In 2011, there was a boom of outside migrations. Indeed, even if 90% of graduates from the north of Italy remained, 6.5% left Italy for another country. Even in central Italy, 5% went to work in other countries. In the south, there was a boom of migrations to different parts of Italy: 52% of graduates went away (Almalaurea, 2012). The migrations did not stop until today, with rates in 2016 which are higher than those of 2011 (see Almalaurea, 2017). A summary about these dynamics is shown in Figure 1.

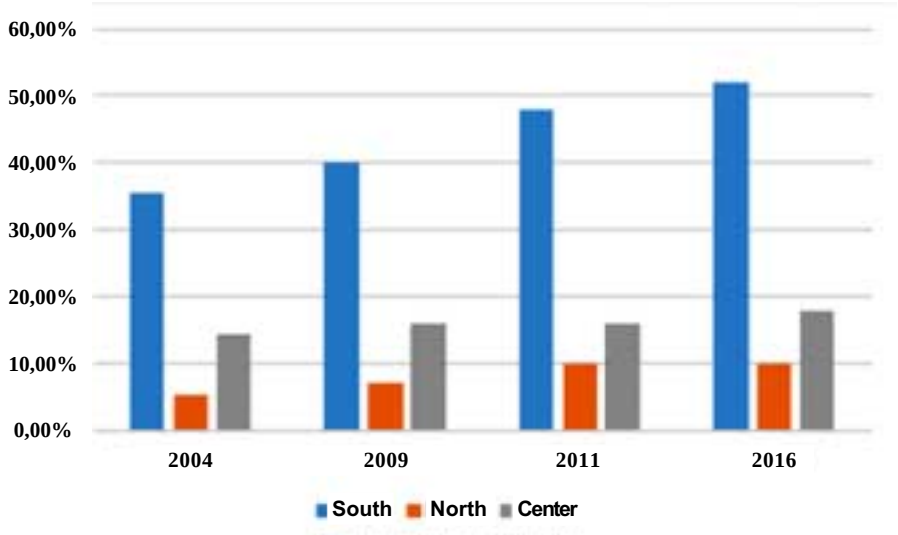

Fig.1: Percentage of graduates from the south, north and center of Italy wholeft their geographical partition to work, in 2004, 2009, 2011 and 2016. Source: Almalaurea (2005; 2010; 2012; 2017).

The most interesting facts about these statistics are two: the growing mobility toward other countries, and the north of Italy as the best area to emigrate within the country. As it is clear from the reports, no migrations (or a very marginal part of these) are directed from north-center to the south. This is, as said above, because of the relevant differences in the economic environment, such as youth unemployment rate, per capita income and else. Moreover, it is important to note that Italy has experienced a massive immigration from other countries in the last two decades (Fullin and Reyneri, 2011). As immigrants are mostly concentrated in the northern regions of the country, the traditional south-north mobility of low-skilled natives is now being limited, involving high-skilled natives the most and, particularly, the younger ones (Mocetti and Porello, 2010). Table 1 shows the unemployment rates in southern, central, and northern Italy, for the whole population and for graduates only, and is basic to explain the migration flows within Italy.

Tab. 1: Per cent unemployment rates in Italy, by region and population category. Source: ISTAT, 2016.

	North		**Center**		**South and Islands**		**Italy**	
Overall	Overall	Youth	Overall	Youth	Overall	Youth	Overall	Youth
	7.6	18.7	10.4	26.7	19.6	42.8	11.7	28.4
Graduates	Overall	Youth	Overall	Youth	Overall	Youth	Overall	Youth
	4.7	14.5	6.0	21.9	11.3	39.3	6.7	22.4

Table 1 shows how huge the gap between the different Italian geographical partitions is, in terms of job opportunities, and how strong the impact of regional aspects in the unemployment dynamics is. In particular, southern Italian unemployment rates are more than double with respect to the northern ones. The situation is not so much different if we compare the statistics for educated people within Italy. Indeed, a high level of education is an important requisite to find a job in Italy, as unemployment rates are much lower among well-educated people. However, it is obvious that the south of Italy offers less opportunities compared to the north, even for high-educated people. It is noteworthy that, in the south, young well-educated people have a higher unemployment rate compared to the low-educated.

Nevertheless, when analyzing the mobility dynamics of young graduates, we cannot ignore the role of the family background. This is because the parents' education and employment are obviously connected to both financial resources of the family and culture within the family itself. In this context, several authors (e.g. Orr et al., 2011) confirmed that students with low-educated parents tend to have

lower abroad moving rates compared to students with high-educated parents. Moreover, this difference also influences the decision about exchange mobility periods (Souto Otero, 2008), as graduates with high-educated parents could be more willing to go away to find better job opportunities. At the same time, we should expect students with parents who have high-level jobs to be more likely to move, as they can rely on their family resources to cover the migration monetary costs. Propensity to mobility can also be influenced by social variables, even if unobservable. Other important examples of non-economical determinants of propensity could be sex, age, religion, etc. Even the previous personal life experiences are important determinants for mobility.

Moreover, Dotti et al. (2013) showed that the metric distance between the region of origin and destination is also important for mobility decisions, finding that, while northern Italian regions are attractive to southern graduates despite the long distance, southern regions are not attractive to northern graduates. Cairns (2010; 2014) points out that the concept of spatial mobility can be linked to the fulfillment of key tasks in the transition to adulthood, such as the ability to find a job and to become independent (Frändberg, 2014). This means that, in addition to economic indicators which are also very important, such as level of remuneration or level of unemployment, other factors such as the will to marry and to create a family should be considered in the analysis of migration problems. Indeed, taking these considerations into account, it has been shown that personal well-being is crucial in determining the will to emigrate to other countries, especially as a result of the economic crisis (Cairns et al., 2012). Indeed, as several studies have shown (e.g. Fabbris, 2010; Kim and Cohen, 2010), most graduates who decide to leave their country or region do it in order to find a better job, especially during or after an economic crisis (Cairns, 2017).

In this paper, we test the above-mentioned relationships, analyzing the impact of sex, regional differences, and social- and life experience-based factors on the mobility dynamics of Italian graduates during the financial crisis, when their migration rate is higher.

3. DATA AND MODEL

In this paper, we test the relation between the mobility dynamics and both economic and social factors. To perform the analysis, we use data from the ninth edition of the "Sample survey on university graduates' vocational integration" carried out by ISTAT (2015). This survey aims at detecting graduates' employment conditions about four years after graduation: for this edition, it refers to people who graduated

in an Italian university in 2011. A one-stage sampling, stratified for sex, university and type of degree is conducted. The sample size is of about 73,000 graduates, representative of the population of both bachelor and master graduates, and each interview was conducted by either CATI (Computer Assisted Telephone Interviewing) or CAWI (Computer Assisted Web Interviewing) method.

In order to assess the role that the variety of factors have in shaping graduates' mobility, we consider a dichotomous dependent variable indicating whether the graduate has or hasn't moved. For this reason, we chose to use a binary Probit regression model. Indeed, this model is a widely-used choice when the dependent variable can take on only two values (Davidson and MacKinnon, 2004) and is often used in the literature to address similar questions about mobility dynamics (see e.g. Buth et al., 2010; Huber and Nowotny, 2013; Huysse-Gaytandjieva et al., 2013). Starting from the ISTAT data, we chose 8 independent variables that the main literature on the field shows to be associated with the probability of migrating for job-related reasons.

The regression model analyzed in this paper can be presented as follows:

$$Pr\left(Y_i^* = 1\right) = \varphi\left(\alpha + \sum_{i=1}^{8} \beta_i X_i + \varepsilon_i\right) \text{ with } \quad _i \quad N\left(0,1\right) \tag{1}$$

where φ represents the standard normal cumulative distribution function, Y_i^* is the latent variable, the X_i's (with i = 1, …, 8) are the independent variables, α is the constant term, the β_i's are the coefficients associated to the independent variables, and ε is the error term.

In Table 2 we provide a short description and the main descriptive statistics of the variables included in the model.

Several studies (e.g. De Jong, 2000; Donato et al., 2006) have shown the existence of strong gender differences in mobility dynamics. Indeed, sex can be a very important determinant for mobility and is an important social issue for policy. We consider the *male* dummy variable in order to capture these differences.

Family background can also influence mobility dynamics. As said above, we expect that if the family has enough financial resources, it is more likely for the graduate to move. We assume parents with a university degree to have a better job and, therefore, their financial resources to be higher than lower-educated ones. Moreover, a well-educated family may also make the graduate more open-minded. For these reasons, we consider two dummy variables: *mothergrad*, and *fathergrad*.

Indeed, most of the internal mobility flows in Italy are directed from the south to the north, because of economic reasons (Bonifazi and Heins, 2000). Thus, we consider a geographical variable, *south*, which is crucial in our regression analysis

as it takes into account the spatial element of the mobility dynamics.

Tab. 2: Description of the variables included in the model.

Name	Variable	Mean	Std. Dev.
moved	Response dummy variable. It assumes value 1 if the graduate works in a different geographical partition than the one he/she is originally from, and 0 otherwise.	.210	.407
male	Dummy variable assuming value 1 if the graduate is male, and 0 if the graduate is female.	.460	.498
mothergrad	Dummy variable assuming value 1 if the graduate's mother holds a university degree, and 0 otherwise.	.158	.364
fathergrad	Dummy variable assuming value 1 if the graduate's father holds a university degree, and 0 otherwise.	.190	.392
south	Dummy variable assuming value 1 if the graduate comes from southern Italy, and 0 otherwise (north-center).	.344	.475
highscore	Dummy variable assuming value 1 if the graduate had a final mark higher than 104 out of 110, and 0 otherwise.	.535	.499
erasmus	Dummy variable assuming value 1 if the graduate joined the Erasmus study program in another European country, and 0 otherwise.	.098	.297
outoftown	Dummy variable assuming value 1 if the graduate rented a bed, a room or a flat in the university town, and 0 otherwise.	.578	.494
worked	Dummy variable assuming value 1 if the graduate worked (either full-time or part-time) during his/her studies, 0 otherwise.	.643	.479

Another variable, *highscore*, is related to the final mark that the graduate obtained in his or her degree. In Italy, the highest mark obtainable is 110; the threshold we selected is 105 because many public competitions in Italy require a minimum mark of 105, which is therefore assumed to be a "high score" in our study.

Then, we included variables related to personal previous life experience, as in Iammarino and Marinelli (2015).

First, we consider whether the graduate took part in an international student exchange program. The basic assumption is that graduates who lived abroad during higher education studies have less difficulties and fears about moving abroad after they graduate. Moreover, they may have improved their foreign language skills and got information and contacts which make future employment in a foreign country a lot easier. Indeed, these exchanges may influence the abroad mobility more than the internal one, but they still have some effects on migration within Italy. Specifically, we consider participation in the Erasmus program, the most common student exchange program in Italy, also because its participants typically receive scholarships covering the cost of living in the foreign country, allowing them to

move regardless of their financial availabilities. This variable is named *erasmus*.

A similar experience that can influence graduates' mobility decisions is, of course, moving into the university town for studying, thus going to live in a new city without their family. For this reason, we consider the variable *outoftown*.

Another important factor which influences graduates' mobility is their previous work experience. We assume that graduates who already worked during their studies are less likely to move, as they are more confident that they can find a job in their home town or in'the one of university. This variable is named *worked*.

4. RESULTS

Using the data described in the previous section, we performed a Probit regression, whose results are presented in Table 3. It is possible to notice the regressors' significance and sign of the relation. However, to get a clearer idea of the effects that any variation in the regressors can have on the response variable, it is useful to calculate and interpret the marginal effects (dy/dx).

Tab. 3**: Probit regression results with marginal effects (dy/dx). Dependent variable: moved.**

Variable	Coefficient	Std. Err.	p-value	dy/dx	p-value
male	.236	.023	0.000	.093	0.000
mothergrad	.124	.034	0.000	.049	0.000
fathergrad	.078	.032	0.014	.031	0.014
south	.969	.024	0.000	.368	0.000
highscore	.024	.023	0.296	.010	0.296
erasmus	.437	.033	0.000	.168	0.000
outoftown	.263	.024	0.000	.104	0.000
worked	-.076	.024	0.002	-.030	0.001
_cons	-.664	.032	0.000	-	-

By interpreting the marginal effects from Table 3, it is possible to notice that males are 9.3% more likely to migrate after graduation with respect to women. This result reflects an important difference between Italy and other European countries, as gender differences strongly depend on the structure of society, i.e. on the division of roles in the labor market and the family. For instance, Faggian et al. (2007) showed that female graduates in the United Kingdom are more likely to move compared to men. One of the key elements to consider in relation to women's mobility is their employment rate, which is usually lower than men's (Olivetti and

Petrongolo, 2008): less opportunities for women may lead to lower expectations than their male counterparts and, therefore, to a lower interest in migrating.

Having a high-educated father raises the probability of moving of about 3%, while having a high-educated mother raises this probability of almost 5%, with a higher statistical significance. This result confirms that the family background has an important influence on mobility choices. A high mother's educational level is a more selective indicator of family socioeconomic status than father's one (Baker and Stevenson, 1986) and leads to better academic performance (Halle et al., 1997). Moreover, as mothers are the main responsible for child-raising in most industrialized countries (Gornick, 1999), their influence and mentality might impact more on children than do fathers'.

Graduates from the south of Italy (and islands) are 37% more likely to move to a different geographical partition to work, with respect to central and northern Italian ones. This outcome confirms the economic differences between the different parts of the country, briefly analyzed in Section 2. Moreover, young people from southern Italian regions are already willing to move to central or northern Italy for study reasons, so that they can attend university courses in more prestigious universities (MIUR, 2017), and there is a small probability that they will return to their city to work afterwards (SVIMEZ, 2016).

Obtaining a high final mark seems not to affect mobility. This result is in contrast with Capuano (2011), who evidenced that graduates with high grades were more likely to move. Even though, according to our study, this variable does not significantly affect the decision to move to a different region, it should be highlighted that no information about the study major – which interacts with marks and is strictly related to the economic environment – was included as a predictor in our model.

Taking part in an Erasmus mobility project during university raises the probability of moving afterwards of almost 17%, with respect to people who did not move to other universities during their studies. This finding is in line with the main related literature. For instance, Di Pietro (2012) found that participating in international student exchange programs increases the likelihood of working abroad for Italian graduates of about 18-24 percentage points. Another study by Parey and Waldinger (2011), focusing on German students taking part in an Erasmus exchange, concluded that they are about 15% more likely to work abroad afterwards. This result can be explained in several ways. For example, we can suppose that graduates who chose to study abroad were preparing themselves for an international career, either in the country in which they studied or another one. In general, people who decide to study abroad at a young age show to be more prone

to future mobility.

Graduates who rented a bed, a room or a flat in the university municipality have had an experience of mobility already before graduation and are therefore more willing to move after getting their degree, with a probability of +10.4%. Studies show that even competition among universities, and their ability to attract students, might be responsible for the distribution of human capital within the country (Cattaneo et al., 2017). This result confirms that previous mobility experiences, as in the case of Erasmus, can have a big impact on future mobility choices.

Moreover, our results show that graduates who worked during university have a 3% lower probability of migrating than those who did not, as they might keep working in the same firm after graduation, or because having been hired in their region before graduation may give them more confidence about the probability of getting another job afterwards. Another explanation can be that working students typically graduate beyond the official duration of their courses, ending up with less ambitious expectations than the other students, which makes them more likely to accept less satisfying job offers (Aina and Casalone, 2011). Indeed, graduates tend to migrate in order to find opportunities in other regions but, considering the other conditions as constant, working in a close place is usually preferable.

5. CONCLUSIONS

Graduates' mobility has a relevant impact on the labor market, also in terms of policy implications. Our findings allow for a better understanding of the migration of high-skilled human capital and its economic and social implications.

The determinants of mobility are several and different, including sociological, economical and life experience ones. The results presented in the paper are consistent with these assumptions. In particular, results show that life experience determinants are crucial to explain graduates' mobility: past Erasmus students move to other geographical partitions 17% more than other graduates, and graduates who had a previous mobility experience (renting a room or a flat before graduation) are 10% more likely to work in a different partition compared to the others.

Family background is also a very important mobility determinant. Again, our study shows its relevance, explaining that the mother's background is more influential than the father's one, maybe because of social, Italian family dynamics, or because it explains family background better than father's.

Nevertheless, it is obvious that economic factors have a key role in explaining mobility dynamics: one of the most important determinants of mobility is the

economic environment, linked to job opportunities. However, even if economic disparities may lead to migration which should in turn reduce them, empirical evidence suggests that, if migration is skill-selective, it may have an opposite effect and reinforce the richest regions at the expense of the poorer ones (Fratesi and Riggi, 2007; Fratesi and Percoco, 2014). In recent years, also due to the financial crisis, the economic differences between the south and the north of Italy became even more pronounced: while the former became poorer, the latter became richer. This caused an amplification of internal migration flows: more southern university graduates are now willing to move to the north of Italy to look for better opportunities. Indeed, our analysis confirms these findings, showing that southern graduates have a 37% higher probability to move compared to the northern ones.

The evidence we presented is subject to some limits and provides food for thought for further research in the field. First, we collected data from a sample of individuals from Italy without making comparisons with other countries. Moreover, the analysis only measures spatial differences considering the three big Italian macro-areas and not the single provinces. It would also be useful to consider all the places where the graduates have lived, and not only the area in which they studied and the one in which they are working, as the whole history of a graduate is important in order to understand his/her mobility choices. A better understanding of the characteristics of the job offers that lead graduates to migrate would also be interesting, as our data do not show whether graduates are more likely to move in order to get a high-level job. Future works can extend our research considering these improvements.

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