Human Capital Accumulation and Migration
in a Peripheral EU Region: the Case of Basilicata

by

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Human Capital Accumulation and Migration in a Peripheral EU Region: the Case of Basilicata[°]

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Abstract

The ability of a regional system to generate human capital is crucial, but it is not a sufficient condition leading to economic success. In this work we emphasise the importance of maintaining and attracting highly skilled and educated individuals and the challenges that migration flows pose on policymaking aimed at fostering human capital accumulation in peripheral regions. We employ a unique data set generated through a postal survey designed and conducted by the authors. The focus of our analysis is on the micro-level location decisions of a sample of highly educated and skilled individuals residing in Basilicata, a small Italian Mezzogiorno region, who have benefited from a locally funded human capital investment policy.

Keywords: Education, Geographical Labour Mobility, Interregional Mobility, Human Capital

JEL classifications: I28, J61, R23

1. Introduction

The importance of human capital as a key source of value added, innovation and economic growth is widely acknowledged by both economists and policymakers. In his seminal paper "Reflections on Investment in Man" (1962), Schultz underlines the importance of improvements in the quality of human capital as one of the major factors explaining economic growth. The abilities of individuals, "the economic capabilities of man", are considered as "*produced means of production* and except for some pure rent (in earnings) for differences in inherited abilities, most of the differences in earnings are a consequence of differences in the amounts that have been invested in people" (Schultz, 1962, p.1). The abilities of individuals are, therefore, the product of individual investments in education and job-training activities.

The relevance of human capital in modern economies, and the divergence between its private and social return justify public policy interventions aimed at subsidising human capital accumulation.[1] The regional dimension is increasingly becoming central in this process of knowledge creation: local governments can directly affect individuals' decision making by subsidising human capital formation. However, as Justman and Thisse (1997) have pointed out, the public benefits of human capital investment "do not always accrue where it is funded". The scope for policy might vanish if locally formed human capital is lost through migration, as emphasised by the *brain drain* literature. A positive self-selection is a stylised fact in the migration literature. This can result in migration widening the regional wage and income gap and lowering the standard of living in the peripheral location, as the new economic geography literature emphasises (Krugman, 1991; Coniglio, 2003). Regional integration of labour markets may increase workers' incentive to spatially relocate, in particular from peripheral to central regions. This is explained by the action of agglomeration forces: human capital migrates from where it is scarce to where it is abundant, rather than vice versa (Lucas, 1988).

In the present study, we emphasise the importance of these considerations through the analysis of a case study. We investigate the location decision of a sample of highly educated and skilled individuals residing in Basilicata, a small peripheral Italian

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[1] Educational expenditure is considered a key component of national investment with a substantial pay-off in terms of output growth. The current state of thinking about this issue is well summarized by Temple

Mezzogiorno region, who have benefited from a locally funded human capital investment policy. The regional policymakers, in recognition of the importance of human capital as a key ingredient for regional growth, have given generous subsidies since the beginning of the 1990s to young graduates who want to attend a post-graduate course both inside and outside the region.

The sample of individuals under analysis is far from being representative of the regional population, but the biased nature of the sample (highly skilled and educated individuals) makes the analysis a natural experiment for assessing the ability of the regional system in a peripheral region not only to *generate* human capital but also to *maintain* it.

The focus of the paper is on the micro-level migratory behaviour. In particular, we want to shed light on the following questions:

1) Who are the migrants? We want to investigate whether there is a significant difference according to some personal characteristics between migrants and non-migrants.

2) What are the main factors influencing migration?

3) Where do migrants go? Is the human capital attracted toward core regions? What are the regional characteristics that make a region attractive for highly educated and talented individuals?

The data set used in the analysis has been generated through a postal survey designed and conducted by the authors. The survey questionnaire was sent to all the individuals who benefited from the local policy measure between 1991 and 2001. For each individual, we have collected data on background, experience and outcome of higher education, opinion on the quality of the course attended, job-search strategy after the course, and space-time career details from first to current employment status. The high quality of the data and the extremely high rate of response (around 70%) make the data set at our disposal a unique tool for studying the micro-level migration decision of highly skilled individuals in a peripheral region.

The empirical analysis aimed at addressing the above mentioned questions consists of two main parts. In the first part, we investigate what are the personal characteristics explaining the propensity whether or not to migrate. This analysis

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(2001), who, after surveying the relevant micro- and macroeconomic evidence, concludes that "the weight of the evidence points to significant productivity effects of educational investment".

exploits maximum likelihood estimation with a logit model. We are able to study different propensity to migrate within a particularly interesting stratum of the population, young and highly educated individuals. Prior insights from migration literature tell us that this sub-group of the population is highly mobile, but to our knowledge there are no in-depth studies focused on their micro-level migration decision. We find that, even in this homogeneous sample, individuals show a different migration propensity on the basis of their personal characteristics. The probability to migrate decreases with age and there is a positive self-selection in migration flows: even among a group of highly educated individuals, the probability to move is higher for most talented ones. Individuals with different educational background have a different propensity to migrate: an individual with a bachelor's degree (or master degree) in business studies or engineering are less likely to stay home than other graduates. An important finding of our analysis is that individuals, who attended their studies outside the area of origin (that is individuals with a previous migration experience), are more likely to migrate. It is worth noticing for its policy implications, that, instead, attending a post-graduate course or getting an internship at home significantly increases the probability of maintaining the human capital generated. We find also that the effect of personal unemployment status on the propensity to migrate is negative, that is unemployed individuals are mainly located in the home region; this gives support to the "contracted" view of migration, i.e. individuals migrate with "a job in their hands". Moreover, people born in urban areas are less likely to migrate compared to those born in small towns.

In the second part of the paper we investigate the spatial structure of the human capital generated through the policy intervention. We use a conditional logit model in order to investigate where highly educated and skilled individuals do go. The use of a conditional logit model for the study of individual migration decision has considerable advantages, since it enables the researcher to take into account the opportunities that individuals face in a set of potential alternatives. In the present study, each Italian region is considered as a potential destination (including Basilicata). Individuals choose the location which offers the higher level of utility on the basis of regional and personal characteristics.

Knowledge of the factors influencing highly skilled individuals' location decision is fundamental to national and local policymakers who wish to capitalise on

this important source of economic development. We study the decision made by both movers and non-movers. Thanks to the availability of very detailed information on individuals' characteristics and past experience, we are able to assess the relative importance of some variables like distance and individual's previous migration experience in a way that is generally not possible due to data limitation.

We find a strong evidence for the importance of spatial variables, such as physical distance, migrants stock from the origin region and direct knowledge of potential destinations due to previous migration experiences, in explaining the pattern of subsequent geographical mobility. Lack or poor quality of information on local economic opportunities represents a market failure that can be, at least partly, corrected by adequate policy measures. Action aimed at this purpose might also be considered as strategic in trying to maintain and attract human capital. Moreover, non-economic aspects are important in influencing high-educated individuals' location choice. Local policy aimed at improving quality of life should be regarded as an important policy instrument along with more classical interventions.

Our analysis explores the factors affecting the location decision of highly educated individuals in an economy presenting all the features of a core-periphery structure.[2] Our results have strong policy implications for the local economy under analysis, however, in our opinion, they also have a general validity for regions facing similar circumstances, such as many peripheral regions across Europe.

The structure of the paper is as follows. In section 2, we describe in more detail the regional policy implemented, the conduct of the survey and the sample under analysis. In section 3, the logit model is presented and the results are discussed. The conditional logit analysis is presented in section 4. Finally, section 5 contains the concluding remarks of the paper.

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[2] Of course, as with all case studies, the results should be critically generalised to other situations. Nevertheless, it is reasonable to argue that the behaviour of the highly educated and skilled individuals in our sample is not substantially different from that of other similar individuals in lagging-behind regions of many developed countries.

2. Conduct of the survey and description of the data

The data used for the empirical analysis are derived from a postal survey of individuals who have received financial support from Regione Basilicata for attending a post-graduate course in a Higher Educational Institution.[3] The survey was designed and conducted by the authors with the collaboration of Regione Basilicata. The survey questionnaire aims at directly asking people about their decision whether or not to move and the main factors influencing their decision.[4] For each individual, we have collected data on background, experience and outcome of higher education, opinion on the quality of the course attended, job-search strategy after the course and space-time career details from first to current employment status. The survey was conducted during May-July 2002. The questionnaire was sent to all the individuals who benefited from the local policy measure between 1991 (the first year in which this measure was implemented) and 2001, which amounts to slightly more than one thousand individuals.[5] A total of 740 individuals returned the questionnaire, approximately 70% of the total. After deleting observations due to incompleteness of some questionnaires, the final sample contains 700 observations.

The individuals in our sample have a bachelor's degree and are resident in Basilicata at the time when they applied to receive funding.[6] The number of individuals who migrated is 411 (58% of the total). It is worth noting that Basilicata, as the rest of the Italian Mezzogiorno, traditionally has been a source of migrants for both other Italian regions and foreign destinations. The propensity to out-migrate toward other Italian regions as measured by the ratio between the (gross) number of people changing their registered place of residence and the total regional population (multiplied by 1.000), is considerably higher than the Italian average. In 1997, this index of migration was 8.4 for the overall Basilicata population against 5.3 for the Italian regional average and 7.2 for the Italian Mezzogiorno (ISTAT, Italy's National Institute of Statistics).

Naturally, we should expect that young individuals from Basilicata have a higher propensity to migrate. In 1997, individuals changing residence to other Italian regions,

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[3] Post-graduate courses were held in Basilicata or outside (also abroad). In what follows we use interchangeably the words course and master for identifying the human capital investment experience financed by the regional authority.

[4] The survey questionnaire is available upon request from the corresponding author.

[5] In order to increase participation, individuals received a follow-up request letter and subsequently were contacted by phone.

in the cohort aged 25-29, were 990 out of a total of 5,137. For this cohort the migration index, as defined above, was 22.6 for male and 18.7 for female (the Italian average was 11.1 for male and 9.9 for female).[7]

3. Who are the migrants?

3.1. Empirical Methodology

A first step of the empirical analysis is related to the discrete binary choice of an individual whether to remain in the region of origin or move to another location. The econometric analysis of this study is based on the micro-level decision-making of a potential migrant. Formally the level of utility enjoyed by an individual i at the present location (h) is:

$$U_h^* = \beta_h ' x_h + \varepsilon_h \tag{1}$$

where x_h is a vector of independent variables and β' the associated coefficients measuring the relative importance of these variables. This vector includes personal characteristics such as age, sex, education and variables reflecting regional characteristics of the origin area.

If the individual migrates to another location (f) the level of utility she will enjoy is given by:

$$U_f^* = \beta_f ' x_f + \varepsilon_f \tag{2}$$

The opportunities and costs, and, therefore, the associated level of utility, which the individual will face, are a function of personal characteristics and regional characteristics of the destination area. In the balance between these two levels of utility

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[6] There is a small group of people (35 individuals) who get a high school diploma.
[7] Note that in our sample the average age is 27.5 with a standard deviation of around 2.5 years.

the effects of intervening obstacles should be taken into account. Costs of migration are a function of individual characteristics and existing barriers:[8]

$$CM_{hf}^* = \alpha' x_c + \varepsilon_c \tag{3}$$

An individual migrates if the benefits from migration $U_f^* - U_h^*$ are greater than the associated cost CM_{hf}^*:

$$M^* = U_f^* - U_h^* - CM_{hf}^* = \beta_f' x_f - \beta_h' x_h - \alpha' x_c + \left(\varepsilon_f - \varepsilon_h - \varepsilon_c \right)$$
$$= \beta' x + \varepsilon \tag{4}$$

where *M** is an unobservable variable representing the net benefit from migration. The observed binary individual choice reveals only if the net benefit is positive or negative, but not the underlying unobservable utilities. Our observation will be:

$$M = 1 \text{ if } M^* > 0$$
$$M = 0 \text{ if } M^* \leq 0$$

On the basis of the outlined random choice approach, it is possible to examine the probability that an individual with a given set of attributes will make the choice of migrating *(M = 1)*:

$$\text{Prob}\left[M = 1 | x\right] = \text{Prob}\left[U_f^* - U_h^* - CM_{hf}^* > 0\right]$$
$$= \text{Prob}\left[\beta' x + \varepsilon > 0 | x\right] \tag{5}$$

We assume that the disturbance ε has a logistic distribution with mean 0 and variance 1. This assumption will lead to a logit model.[9]

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[8] Barriers to labour mobility and migration can be of different nature. Factors such as for example geographical distance, uncertainty linked to a lack of information, a different environment, legal barriers, are all important and might be perceived in a different way by heterogeneous individuals.

[9] Logit and probit models are widely used in econometric applications. The difference between the two models is based on the particular probability distribution function adopted. While the former uses a logistic distribution function the latter is based on a cumulative normal one. The two distributions are

3.2. Description of the data and variables influencing migration

The dependent variable **HOME** is a dummy that equals 1 if the individual resides in Basilicata at the time when she received the questionnaire and 0 otherwise. We look at individuals' current location.[10]

The essence of this approach is to determine the characteristics that differentiate the two groups of individuals and evaluate the impact of some individual characteristics on the propensity to migrate.

The explanatory variables used in the econometric model are defined in *table 1*. The set of variables include (*i*) individual characteristics such as age, sex, city of origin and employment status (*ii*) detailed information on educational background (marks obtained, subject of study, location of university and master studies, eventual internship period after the master, etc.) (*iii*) information on their geographical preferences in the job-market search after completion of the master course.

The literature on migration has shown that among the factors which contribute to the decision to migrate a relevant role is played by personal characteristics (sex, age, etc.) and a number of life-cycle considerations (marriage, completion of schooling, entry into the labour force, etc.).

Several studies have shown that the peak migration propensity occurs in the early twenties and declines steadily thereafter (Ledent, 1990; Otomo, 1990; Vergoossen, 1990; Long, 1992; Plane, 1993). We investigate the relationship between age and migration propensity by using the variables **MASTERAGE** and **MASTERAGE2**, which are the age at the time of master studies and its square.[11] The expected sign is positive, even if, given the considerable homogeneity in age levels within our sample, we do not expect a significant and strong effect for this variable.

The relationship between education and migration propensity has been widely studied in empirical works. High educational attainments are generally employed as a proxy for individual abilities. Since more talented and able individuals have both lower

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similar except for the heavier tails of the logistic distribution. On a theoretical ground it is difficult to justify the choice of one instead of the other, since it makes very little difference in terms of substantive results.

[10] In section 4, we estimate a conditional logit model to examine the location decisions of these individuals at completion of their master studies. In that section we discuss the motivations which lead us to investigate individuals' location decisions in two different points in time.

costs and higher returns from migration, education is positively associated with migration probability (Ghatak *et al.*, 1996; Antolin and Bover, 1997; Ritsila and Ovaskainen, 2001). This implies that migrants tend to be favourably "self-selected" for labour market success (Borjas, 1987; Borjas *et al.*, 1992a,b). On the basis of these characteristics, individuals in our sample should be considered as highly mobile. We want to test if, even within this sample, variation in these personal characteristics matters in explaining whether individuals are likely to stay or move. In our study we employ a more direct measure of educational attainment, i.e. the final mark of the bachelor's degree (*MARK*).

The expected effect of gender on the propensity to migrate is ambiguous. Traditionally male individuals have been found to be more likely to migrate, but, as stated in Ghatak *et al.* (1996), several studies have shown that this is no longer typical.

The effect of the size of the place of origin on the propensity to migrate is not well documented in the literature. Is there any significant difference in the propensity to migrate between individuals born in larger urban areas compared to those born in rural areas or small towns? The variable *CITY* allows us to test for significant differences between people born in a city and those born in smaller towns.[12] We expected that this variable would have a positive sign, since the cost of migration for individuals born in a city is higher than for residents in smaller centres, which have stronger push factors for young and highly educated individuals.

Besides, we want to check if individuals with different educational background might have a different propensity to migrate (*UNI_ECON*, *UNI_ENG* and *UNI_LAW*). An engineer and a lawyer might face a considerably different spatial distribution of job-market opportunities.

Individuals' past migration experience during the period of investment in human capital is essential for understanding subsequent pattern of geographical location. If an individual has lived in a certain location different from home during the university or master studies she is more likely to migrate for two main reasons. First, these experiences enable the building of personal connections (with friends, potential employers, etc.), which reduce the information costs of finding employment opportunities. Moreover, knowledge of the local environment reduces the costs of

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[11] Age squared is included to test whether there is a non-linear effect of age on the dependent variable.

adapting to new environments. "The [...] repeat migrant [...] have substantial first-hand knowledge about locations where he lived before, and [...] he may be able to recoup some part of any location-specific capital he acquired there" (DaVanzo, 1983). Second, individuals who have already moved once could have lower costs associated with a second move; for example in term of psychic costs, since original family ties and the like have already been broken (Farber, 1978 and Herzog and Schlottmann, 1981).[13] We test for the relevance of these considerations by means of three dummy variables: ***UNI_NORTH***, ***UNI_CENTER*** and ***MASTER_AWAY***. According to our hypothesis we expected a negative signs for all those three variables.

Since an internship was for some individuals an integral part of the master course financed, we include a dummy variable ***STAGE*** (it equals 1 if the individual did an internship and zero otherwise) to investigate whether this individual experience might explain part of the propensity to migrate. In addition, we consider the effects of doing an internship at home adopting the dummy variable ***STAGE_HOME*** equal to 1 when the master was held at home and zero otherwise. In this case the sign of the estimated coefficient should be positive. [14]

In the questionnaire we asked individuals about the spatial structure of the job-search after completion of the master course. One of the item concerned individual's spatial-preferences. The variable ***NO_PREF_HOME*** captures, ceteris paribus, the effect of a lack of personal attachment to the origin region. Obviously, we expected a negative sign for the coefficient of this variable. Implicitly, the baseline model would include individuals with a strong attachment towards Basilicata.

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[12] Individuals born in a city are those born in Matera or Potenza, which are the two main urban agglomerations in Basilicata.

[13] Molle and van Mourik (1989) found that the psychic costs significantly reduce migrations within Europe.

[14] In this study the Universities of Salerno and Bari are considered as "home" locations. This is justified on the basis of strong economic and social connections between the provinces of Matera and Bari, on one side, and between the provinces of Potenza and Salerno, on the other side. Moreover, Salerno and Bari are close, respectively, to Potenza and Matera and well connected. We also have to consider that University of Basilicata does not have a long tradition, so the Universities of Bari and Salerno attract many students from Matera and Potenza**.**

Table 1 – Logit model: description of the explanatory variables

Variable	Description	Expected sign of effect	Mean	Std. dev.
MALE	1 = male 0 = female	+ / -	0.44	0.49
CITY	1 = born in city 0 = born in a small town	+	0.57	0.49
MASTERAGE	Age at the time of attending Master studies	-	27.47	2.75
MASTERAGE2	Age, as defined above, squared	+ / -	117.28	63.83
MARK	Final mark of the bachelor's degree (between 66 and 110)	-	102.7	8.17
UNI_ECON	1 = degree in business studies 0 = other	+ / -	0.36	0.48
UNI_ENG	1 = degree in engineering or architecture 0 = other	+ / -	0.09	.028
UNI_LAW	1 = degree in law 0 = other	+ / -	0.31	0.46
UNI_NORTH	1 = University attended in North regions 0 = other	-	0.22	0.41
UNI_CENTER	1 = University attended in Central regions 0 = other	-	0.18	0.38
MASTER_AWAY	1 = Master course attended outside the home region 0 = other	-	0.75	0.43
STAGE	1 = individual did an internship 0 = other	-	0.79	0.41
STAGE_HOME	1 = internship at "home" (in Basilicata or in the provinces of Bari and Salerno) 0 = other	+	0.15	0.36
NO_PREF_HOME	1 = Basilicata is not the preferred location 0 = other	-	0.64	0.48
UNEM_NOW	1 = unemployed 0 = other	+ / -	0.15	0.36
HIGHMOB	1 = individual changed its jobs more than 3 times between the first and the current employment position 0 = other	-	0.11	0.31
MASTERYEAR	The year when master course has been attended	+ / -	7.53	2.21

Another personal characteristic we deal with is the unemployment status (**UNEM_NOW**).[15] On the expected sign of the coefficient associated to this variable the literature is controversial. According to the "contracted" migration view, the sign should be positive, that is unemployed individuals should mainly be located in the home region since individuals migrate with a "job in their hands". Opposed to this view is the idea of "speculative" migration, which sees individual migration as part of the job-search strategy. As pointed out by Herzog *et al.* (1993) in their survey of the empirical literature concerning the complex interrelationships among personal unemployment, migration and the likelihood of re-employment, the availability of microdata is essential to study the relationship between unemployment status and migration. Hence, we can shed new light on this point.

The variable **HIGHMOB** measures the number of individual's job changes. We expect a negative sign, since individuals who change job frequently should be also more spatially mobile.

Since we are investigating migration decisions along a ten year time span, it is necessary to control for different propensity to migrate due to changes in economic conditions in the alternative destinations. For this reason we introduce the variable **MASTER_YEAR** as a control variable.

3.3. Discussion of the empirical results

Table 2 reports the results of the econometric analysis. Most of the coefficients are statistically significant and have the expected signs. Since the estimated parameters of a binary regression model do not provide directly useful information for understanding the relationship between the independent variable and the outcome, in the last column the marginal effects are reported.[16]

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[15] Unemployment might affect mobility at three levels: (1) personal unemployment; (2) regional unemployment differentials; (3) national unemployment rates. Here we analyse only the effect of personal unemployment, since we are studying the personal characteristics explaining the propensity to migrate. In order to consider the effect of the regional unemployment differentials, we included the regional unemployment rates in the conditional logit we estimate in the section 4.

[16] The baseline group is defined as an individual with the following characteristics: a female, born in a urban area, with a bachelor's degree other than economics, law or engineering, attending both university and master study at home, no internship, with expressed preferences for the home location and currently employed. All continuous variables are specified at the mean value.

We do not find any evidence of differences in the migration behaviour between male and female individuals. This is an interesting result, even because the probability to migrate for the female population in Basilicata, in the cohort aged 25-29, is lower than that for male individuals in the same cohort. This finding points out that for female individuals the propensity to move increases relatively more than males if they are highly educated.

People born in urban areas are less likely to migrate (7%). This outcome can be probably explained by the fact that larger city are characterised by a critical mass of amenities, therefore, the push factors are smaller as compared to towns.[17] In addition, areas densely populated can offer more job opportunities. Individuals from small centres are likely to move anyway for job reasons; hence, for these sub-groups the substitutability between a home or outside location is higher.

The probability to remain in the home region increases with age. We find support for a non-linear effect of this variable. Since age is measured at the moment when the bachelor's degree was completed, in addition to the life cycle considerations, which link age and migration propensity, this variable might also be interpreted as a qualitative measure of personal abilities. Young individuals are those who completed university studies in a shorter time span, i.e. the most talented individuals. The positive sign of the estimated coefficient confirms that there is a positive self-selection in migration flows. Even among a group of highly educated individuals, the probability to move is higher for most talented ones.

The final mark of the bachelor's degree does not contribute in explaining the propensity to stay at home.

Individuals with different educational background have a different propensity to migrate. Among the variables, which describe the subject of the university courses attended, we find that **UNI_ECON** and **UNI_ENG** are significant. The negative signs are probably justified by the fact that the pull factors for individuals with a degree in engineering and business are higher because some of these individuals are going to be employed in sectors like R&D, banking, etc, which are typically available in core and not in lagging behind regions. An individual with a bachelor's degree in business studies and engineering are, respectively, 12.4% and 18.4% less likely to stay home

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[17] For instance in terms of selection of restaurants, cinemas and in general to a wide set of consumption possibilities.

than other graduates. This outcome has strong policy implications: policymakers could be interested in giving priorities to finance human capital formation in subjects more closely connected with the needs of the regional economy. This might increase the probability of maintaining the human capital generated.

In our analysis the most important variables are those related to location where people attend university, master and, eventually, got an internship. Our hypothesis is that individuals who attended their studies outside the area of origin are more likely to migrate. This is explained by the fact that individuals with a previous migration experience in a given destination acquire information on the local labour market at low costs through a series of sources (interpersonal communications with friends, potential employers, local communication media etc.). Also psychic costs of migration will be lowered by an increased familiarity with the local environment. The variables that take into account this aspect are *UNI_NORD*, *UNI_CENTER*, *MASTER_AWAY* and *STAGE_HOME*. The results support our hypothesis. The coefficients have the expected signs. *MASTER_AWAY* and *STAGE_HOME* have both a strong marginal effect. Attending a master away, decreases the probability of remaining in the home region of 19.4%.

The coefficient of the variable *STAGE_HOME* captures the effect on the probability to stay of an internship in the "home" location. We have included also the dummy variable *STAGE*. It is significant and has a negative estimated coefficient. This outcome confirms our previous hypothesis: getting an internship increases the probabilities that an individual remains there where he gets it; since the majority of the individuals got their internships outside, this increases the probability to migrate. Improving the connections with local economic agents by integrating higher education courses with internship in local enterprises and institutions would improve significantly the ability of retaining human capital. In fact, an internship at home increases the probability of staying by 8.3%.

The variable *NO_PREF_HOME*, as we expected, has a strong impact (a marginal effect of 21.3%) and it is very significant.

We find that the effect of personal unemployment on the propensity to stay home is positive, that is unemployed individuals are mainly located in the home region. This outcome is in line with the "contracted" migration view, whose prediction is that individuals migrate with a "job in their hands". It is interesting to compare this finding

with the results of other studies using microdata (see, for example, DaVanzo, 1978 and Herzog and Schlottmann, 1984, whose geographical focus is on the United States, and Molho, 1987; Hughes and McCormick, 1989; Pissarides and Wadsworth, 1989 and Antolin and Bover, 1997 for Europe). Differently from our results they find that unemployed individuals are more likely to move than the employed.[18] Our results could be explained by the presence of family networks that work like a social security system. Moreover, if we interpret the unemployment status as a proxy for low individual abilities, another explanation could be given by the presence of a process of positive self-selection among the individual of our sample.

We find a weak evidence for the hypothesis that more dynamic individuals in the labour market are also more spatially mobile (***HIGHMOB***). These people are 10.4% less likely to remain in Basilicata.[19] The relationship between residential movement probabilities and job changing has been analysed also in Molho (1987), who obtains different results. This study uses a microdata set and is devoted to the analysis of males aged between 16 and 24 in Great Britain. It shows that residential moves are less common amongst those changing occupation. However, the results become similar, when it considers only the individuals changing occupation and improving their "job position".

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[18] Some studies have shown that the positive effect of personal unemployment on the propensity to migrate becomes lower the larger the unemployment insurance given (Antolin and Bover, 1997) and the more lasting the unemployment is (McHone and Rungelin, 1993).

[19] Caution should be given to the interpretation of this variable. The causality might actually work in the opposite direction; people residing in Basilicata could be less dynamic as a consequence of local labour market conditions. We need to further investigate this aspect.

Table 2 - Logit Regression results

Dependent variable: HOME	Coeff.	Marginal effect
MALE°	0.329	0.052
	(1.55)	(1.57)
CITY°	0.366*	0.070*
	(1,76)	(1.71)
MARK	-0.014	-0.003
	(1.13)	(1.11)
MASTERAGE	0.428*	0.075**
	(2.45)	(2.36)
MASTERAGE2	-0.017*	-0.003**
	(2.27)	(2.21)
UNI_ECON°	-0.612*	-0.124**
	(2.21)	(2.08)
UNI_ENG°	-0.870*	-0.184*
	(2.07)	(1.87)
UNI_LAW°	-0.060	-0.011
	(0.22)	(0.22)
UNI_NORTH°	-0.098	-0.018
	(0.39)	(0.38)
UNI_CENTER°	-0.242	-0.045
	(0.86)	(0.80)
MASTER_AWAY°	-0.910**	-0.194**
	(3.20)	(3.37)
STAGE°	-0.585**	-0.117**
	(2.35)	(2.20)
STAGE_HOME°	1.015**	0.130**
	(3.13)	(2.62)
NO_PREF_HOME°	-0.989**	-0.213**
	(4.86)	(4.36)
HIGHMOB°	-0.523	-0.104
	(1.58)	(1.41)
UNEMP_NOW°	3.520**	0.216**
	(7.87)	(3.41)
MASTERYEAR	-0.210**	-0.035**
	(4.32)	(3.14)
Constant	1.45	
	(0,92)	
N. Observations	700	
LL	-324.89	
Pseudo R2	0,315	
Absolute value of z statistics in parentheses		
* significant at 10%; ** significant at 5%		
° dy/dx is for discrete change of dummy variable		

The probability to migrate is increasing along the time span we are considering (**MASTER_YEAR**). This finding is in line with the pattern of internal migration in Italy. Aggregate statistics show that, during the last five years, the number of people who migrate from the South to the North of Italy has considerably increased.

4. Where do migrants go?

4.1. Empirical Methodology

In the previous paragraph we have considered the individual migration decision in a binary framework, "move" versus "non-move". This approach was needed to investigate the existence of underlying differences between these two sub-groups of individuals, i.e. which individuals are more likely to migrate (or conversely to "stay home"). The aim of this section is to investigate which location within a choice set individuals select. The following analysis considers each individual's choice among the 20 Italian regions (including the home location).

The choice of the appropriate econometric methodology depends on assumptions regarding the process of individual migration decision. If migration is a sequential decision-making process, individuals will first make the decision whether or not to move and then (for the movers only) decide in which destination to relocate. Those behavioural assumptions underline the necessity to use a model which treats the decision to migrate separately from the choice between potential destinations. The natural candidate is a nested logit model or alternatively a model focusing on choice within a set of potential destinations only for the movers.

In a recent study, Davies, Greenwood and Li (2001) have argued that the decision to move and that of the destination choice cannot be considered as separated. Individuals jointly decide whether and where to move. We believe that this behavioural assumption is more close to reality. Methodologically this assumption on individual behaviour leads to a conditional logit model.[20]

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[20] The conditional logit model can only identify choice-specific attributes (which might vary across individuals) but not individual-specific attributes or origin-specific attributes. Nevertheless, individual characteristics might be incorporated using interaction terms and a fixed-effect (a dummy variable equal

The empirical model representing the migration decision might be derived from individual utility-maximising behaviour in the framework of a random utility model. Utility of an individual i at location j is given by:

$$U_{ij} = \beta' X + e_{ij} \tag{6}$$

where X is a vector of observable attributes pertaining to the potential destination regions and β is a conforming vector of utility coefficients, which might vary depending on characteristics of the decision-maker, and e_{ij} is a random disturbance. McFadden (1974) demonstrates that if the random disturbances in equation (6) are independent and identically distributed with the Weibull distribution, then the probability that an individual i will choose location j is given by:

$$P_{ij} = \frac{e^{(\beta' X_j)}}{\sum_{k=1}^{K} e^{(\beta' X_k)}} \tag{7}$$

where K is the number of alternative locations.[21]

Individual i chooses location j when U_{ij} is the maximum among the set K of potential destinations. The probability of locating in a particular region depends on economic attractiveness but also on amenities and quality of life that the region is able to offer compared to other competing destinations.

In our analysis each individual i is paired with values of the independent variables (regional characteristics) relative to the year of completion of the course.[22] This approach has two positive effects. Firstly, the independent variables reflect regional characteristics at the moment when job-search activities were taken. Given the time span of our data, regional economic opportunities might have changed over-time. Secondly, we increase the variation in the independent variables, which is an advantage in the estimation of the conditional logit model.

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to one if the potential alternative is the home region) can be used to capture non-observable factors explaining a greater attachment to the origin region.

[21] We have performed tests for the Independence from Irrelevant Alternatives (IIA). The parameter estimates appear stable when we exclude sets of alternatives from the choice set.

Generally, the interpretation of the coefficients in logit models is not straightforward. One way of making this interpretation easier, in particular to assess their magnitude, is to express coefficients as average probability elasticities. As in Friedman *et al.* (1992), regional characteristics for each year are normalised to the national mean. Due to the normalisation, the mean of the independent variables is equal to unity, and the estimated coefficients have a convenient elasticity-like interpretation. The elasticity of the probability that an individual will choose region *k* with respect to an explanatory variable x_s can be calculated by differentiating equation (7):

$$E_{js}^i = \frac{\partial P_j}{\partial x_s} \frac{x_s}{P_j} = \beta_s (1 - P_j) \tag{8}$$

where P_j is the probability of selecting location *j*, x_s is the *s*th variable of the vector *X*, and β_s is the relative estimated coefficient.

If we sum across all individuals (*i*) and potential destinations (*j*) we obtain the relationship between average probability elasticity and the coefficient estimates, β:

$$\frac{E}{K} = \sum_{i=1}^{N} \sum_{j=1}^{K} E_{js}^i / K = \beta_s \frac{K-1}{K} \tag{9}$$

Since *K*, the potential number of locations, in our study is 20, elasticity can be easily obtained by multiplying the estimated β by 0.95. For the average region a one-percent increase in the values of independent variable x_s relative to the national mean (which is one) will cause a $\beta_s * (0.95)$ percent change in the estimated probability.

Normalisation has further advantages, it allows us (i) to remove the national growth trend for the independent variables over the period considered (ii) to take into account the uneven pattern of growth across Italian regions (iii) to use similar scale for the independent variables used in the estimation and, therefore, to reduce computational problems.

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[22] Due to lack of data this approach is not possible for a limited number of independent variables. In these cases we use the figures relative to the closest year available.

4.2. Description of the data and variables influencing migration

The data on individual migration decision are derived from the postal survey as described in section 2. The conditional logit analysis is performed on migration data for 603 highly educated individuals that have benefited from the regional policy previously discussed. The sample under analysis is slightly different from the one used for the binomial logit, since we exclude individuals who have jet to find employment and those migrated to a foreign destination. [23] Another difference with respect to the logit model is given by the fact that in this section we perform a conditional logit analysis which relates to the individual migration decision at the moment of the *first employment* after the course financed by the regional authority.[24] This enables us to analyse, across individuals, a quite homogeneous episode of personal decision making. Further relocations after the first employment can be influenced by a wide array of different reasons for which it might be difficult to control. Besides, the difference in the spatial distribution of those individuals between the first and current employment is relatively small.

Figure 1 illustrates the regional distribution of the human capital "generated" by the local policy measure. Only 27.4% of these individuals are employed in Basilicata after the human capital investment period. A considerable share of individuals in the sample decides to work in Lombardia (mainly in the area of Milano) and Lazio. In this section we aim at a more in depth investigation on the regional characteristics affecting individuals' location decision. For each individual in the sample, the data include 20 rows (one for each potential location).

The dependent variable **CHOICE** is equal to 1 for the region where the first job after the course was obtained and zero otherwise.

The independent variables used for the conditional logit are reported in *table 3*. The variables thought to influence migration decision include those reflecting economic conditions and quality of life along with some measures of individual migration costs associated with the potential destinations (availability of information and psychic costs).

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[23] We have decided to keep out of the sample individuals who never found employment since they are obviously mainly located in the home region and individuals who have selected a foreign destination due to practical difficulties in finding comparable destination specific data.
[24] In the logit we have looked at current employment (that is employment at the time when the survey was conducted).

The variable ***IPUL***, regional income per unit of labour, is included as a measure of potential economic gains (or losses) from migration. A positive sign is expected for the coefficient of this variable, which means that individuals are attracted by locations with relatively higher income per unit of labour.

The regional ***unemployment rate*** is also used as a relative measure of job opportunities in a potential destination. We expect a negative sign on this variable since higher unemployment areas should deter in-migration.

We use the GDP per capita growth rate in the 3 years preceding the end of the master course (***GDPPC3Y***) in order to test whether individuals are attracted toward regions outperforming the national growth trend. This variable is aimed at capturing the recent dynamics of the regional economy rather than the static aspect of economic success, which should be captured by the two measures described above. Also for this variable we expect a positive sign.

Of particular interest are those variables reflecting relative quality of life in potential destinations. Florida (2002) argues that place-based characteristics such as lifestyle options, amenities and quality of life in general have an important function as catalyst of talented individuals in U.S. cities. In a recent research Glaeser *et al.* (2000) conclude: "if cities are to remain strong, they must attract workers on the basis of quality of life as well as on the basis of higher wages". In our analysis we measure the impact of a set of quality of life variables on the probability that a certain region is selected by the individuals of our sample.

The variable ***CULT*** represents expenditure per capita for fine arts and musical performances. This measure is a good proxy for demand, and therefore availability, of cultural amenities and is expected to positively influence the probability of migration in areas with a relatively higher value for this variable. We investigate also the effects of crime on migration decision by employing two variables. ***CRIME1*** is the percentage of micro-crime offences out of the total number of declared offences.[25] These kinds of micro-offences are supposed to have a high impact on the day-by-day quality of citizens' life. Higher values relative to the national average are expected to have negative influence on migration. While this variable captures the "qualitative" aspects of criminal activity, it is not a good measure for its quantitative aspects. In this respect

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[25] This index measures the number of offences like robberies in cars, apartments and shops, pick pocketing out of the total number of offences.

we use **CRIME2**, which measure the number of violent episodes of crime per 10,000 inhabitants.

Figure 1- The geography of the human capital generated: first employment
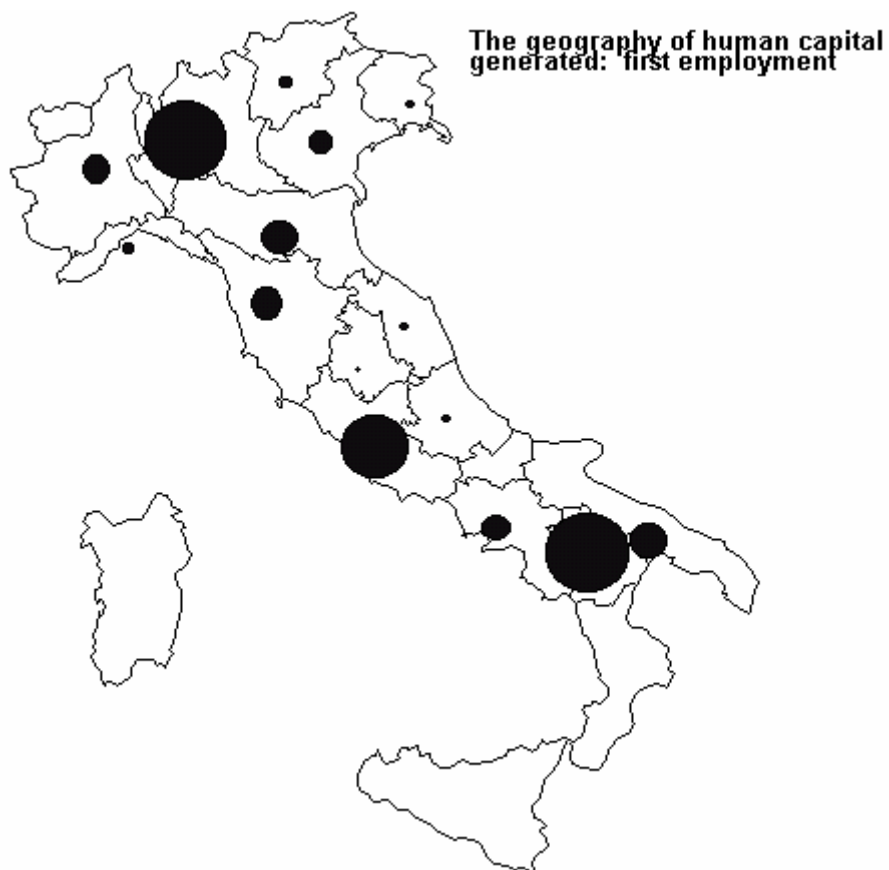

The geography of human capital generated: first employment

Table 3 - Variables employed in the conditional logit

Variable	Description	Expected sign	Source
IPUL	Income per unit of labour (employee) (current Euro)	+	Istat
Unemployment rate	Regional unemployment rate (%)	-	Istat
GDPPC3Y	Growth rate of the regional Gross Domestic Product (3 years)	+	Our calculations on ISTAT data
PREF_BASILICATA	Region specific dummy variable; equals 1 for Basilicata in the choice set if the individual have expressed a preference for the home region in her job-market search activity after completion of the master course,	+	Questionnaire
DISTKM	Distance from the province of origin (Potenza or Matera) to each Italian regional capital, Distance is expressed in 100 KM by car	-	Our calculations
DISTKM2	DistanceKM (as calculated before) squared	+	Our calculations
DISTKMADJ	DistanceKM from the province of origin as measured before, modified by assigning value "zero" to regions where the individuals have attended university, master studies or the internship	-	Our calculations
DISTKMADJ2	**DistanceKMADJ** (as calculated before) squared	+	Our calculations
PASTMIGRODEGREE	Sum of migration outflows of individuals with high school or university degree from Basilicata to each Italian region, The variable is calculated summing flows for the last 5 years preceding the year of completion of the master course,	+	Our calculations on ISTAT data
CULT	Expenditure per capita at a regional level for theatrical and musical performances (thousand of lire - constant price 1999 - values have been deflated using the consumer price index)	+	Istat calculations on SIAE data
CRIME1	Percentage of micro-crime offences out of the total number of declared offences	-	Istat
CRIME2	Number of violent episodes of crime per 10000 inhabitants	-	Istat
POPDEN	Index of population concentration; resident population in the provincial capital / (total resident population in the province) - (resident population in the provincial capital)*100 (data 1999)	+/-	Istat
UNIDUMMY	Dummy variable; equals 1 for the region where the individual attended university and 0 otherwise (note: University of Salerno and Bari are considered in this study "home" (Basilicata) locations due to geographical and cultural proximity)	+	Questionnaire
MASTERDUMMY	Dummy variable; equals 1 for the region where the individual attended master studies and 0 otherwise (note: Salerno and Bari are considered in this study home (Basilicata) locations)	+	Questionnaire
STAGEDUMMY	Dummy variable; equals 1 for the region where the individual did the internship and 0 otherwise	+	Questionnaire

Besides, we use an index of population concentration **POPDEN.** Unfortunately this variable is available only for year 1999, but we do not expect much variation in the time span considered here. This variable is measured as the ratio between the regional population living in the main city of each province within the region and the residual regional population living in smaller centres. High values of this measure imply more agglomeration into few cities. We do not have a priori expectation on the sign of this variable since it might capture both congestion costs and agglomeration forces.

Migration literature suggests that the stock of established migrants originating from the same location is relevant in explaining the pattern of subsequent migration streams (see Carrington *et al.*, 1996; Greenwood, 1969). Past migrants reduce the cost of migration for other migrants by facilitating the flow of information on employment opportunities and reducing the costs of adaptation to a new environment by means of direct or indirect support. We test this hypothesis by using a variable **PASTMIGRODEGREE**, which is measured as the sum of past migrants from Basilicata to any potential destination over the last five years preceding the end of the master course.[26] We expect therefore a location with a past migrants stock from Basilicata relatively higher with respect to the national mean to be a more attractive destination.

Distance (**DISTKM**) is employed as a proxy for direct economic costs and psychic costs related to migration. This variable is measured in hundreds of kilometres by road between the main city of the province of origin and the capital city of each potential destination. Distance for the home region is zero. We use also distance squared (**DISTKM2**) in order to investigate non-linear effects eventually associated with increasing distance. As pointed out by Davies *et al.* (2001) a significant advantage of using the conditional logit for studying migration is the possibility to investigate the effect of distance. In models where the set of alternative choice is not explicitly considered, distance is simply ruled out. The adverse effect of distance on migration is generally attributed to two alternative explanations: (*i*) increasing psychic costs as

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[26] The variable is created by summing flows of migrants with non-compulsory education levels (high school degree and above). As an alternative we have used a measure of total migration flows and even if the qualitative nature of the results does not change, the variable used in the analysis has a stronger explanatory power. Since it is difficult to assign a value for this variable in correspondence to the home location (Basilicata), we decided to consider the effects of the variable only for the migrants. This approach is expected to control for any bias in the estimation of the relative coefficient.

individuals move from the region of origin (*ii*) the increasing costs and obstacles to information flows available to potential migrants on job opportunities in a set of destinations (Schwartz, 1973). These explanations should not be considered as mutually exclusive.

Since we are studying the migration decision of individuals coming from the same region of origin, we obviously observe in the data a higher propensity to select the home region. Some individuals will have an attachment toward this region which is explained by a set of economic and non-economic unobservable factors. The inclusion of a dummy variable for Basilicata (home region fixed-effect) should capture the effects of these unobservables. Nevertheless, individuals might or might not have a "home" attachment; this is particularly important given the nature of our sample, who are likely to have a looser attachment to their home region compared with the rest of the population. In the questionnaire we have asked individuals about their geographical preferences in the job-market search after completion of the master course. We use this information to generate a dummy variable (***PREF_BASILICATA***) which is equal to one for region Basilicata in the choice set only for those individuals who have expressed a geographical preference for the home region. This should capture the "home" region attachment only for the individuals who really have such attachment.

4.3. Discussion of the Empirical Results

The results of the conditional logit estimations are presented in *table 4*. As mentioned in the methodological section, since the explanatory variables have all been normalised (apart from distance variables) relative to the national average, the magnitude of the coefficient corresponds to their relative importance. Coefficients on non-dummy variables have an elasticity-like interpretation as described in equation (9).

Overall, the explanatory variables are statistically significant and have the expected sign. *Version (A)* presents estimation of a quite parsimonious model with a specification that is similar to others employed in migration literature. All variables are significant and have the expected influences on the attractiveness of a region. The second column, *version (B),* shows the contribution to the model estimation given by the inclusion of quality of life measures. The importance of "quality of life" variables for migration decision of highly educated and skilled individuals is confirmed by the

fact that the variables **CULT**, **CRIME1** and **CRIME2** are highly significative. Individuals are attracted towards location with higher cultural amenities and deterred from locations with diffused micro-criminality.

Version (C) and version (D) of the model display the importance of taking into consideration the effect of a "subjective" rather than a physical measure of distance. Migration is an important and complex decision for individuals and the amount of information required for taking an accurate choice might be quite substantial. A potential migrant will form his own subjective predictions on future income (or more generally, utility) streams in a given destination. Even within a rather homogeneous group of persons as the one in our study, the available information and personal connections greatly differ. The probability that an individual will select a given location will increase the larger is the amount of information available on job opportunities in that location. It is an acknowledged fact in migration studies that the quantity and quality of information are negatively affected by distance. Knowledge about the destination region depends upon personal contact and upon sources of information which are not universally available. Physical distance is a weak approximation for the difficulties in accessing to the needed information.

Instead of using physical distance as a proxy for these costs, thanks to the quality of our data we are able to use a more appropriate measure of relative distance, which takes into account individuals past migration experiences. The hypothesis under analysis here is that individuals with a previous migration experience in a particular destination acquire information on the local labour market at low costs. Also psychic costs of migration will be lowered by an increased familiarity with the local environment. In turn these individuals have a higher probability of selecting that location. We use information on individuals past migration experience during the university, post-university studies and eventually during an internship period.

In version (C) we use two new variables **DISTKMADJ** and its square **DISTKMADJ 2** (see table 3 for explanation) which incorporates information on the individual past migration experiences. As we can see, these two variables are highly significative and substantially improve the overall performance of the model. The estimated coefficients of these two variables do not differ dramatically from the previous two adopted. By using this specification we implicitly assume that past migration during the university studies, master studies and those for the internship have

the same effect on the probability of selecting a certain location. Of course this might not be true since they represent episodes of individuals' life with a different proximity to individual job-market search activities. For instance we might expect that the period of the internship and master course was more job-oriented than the university period. We capture the separate effects for these individual experiences in *version (D)* by means of three dummy variables **UNIDUMMY**, **MASTERDUMMY** and **STAGEDUMMY** (see *table 3* for details). The internship considered here is part of the master course financed by the regional authority and is not necessarily done in the same region where the master was held. As expected, and not surprisingly, an internship in a given location substantially improves the probability that the individual will remain there. This effect is stronger compared to that of **MASTERDUMMY** and **UNIDUMMY**, which are nevertheless quite important. The importance of these dummy variables in our study underlines how relevant is the availability of information on potential destination for the individual's migration decision process. Lack or poor quality of information on local economic opportunities represents a market failure that can be, at least partly, corrected by adequate policy measures.

Turning to the rest of coefficient estimates, the model confirms that economic opportunities in the potential destination are relevant for the location selection process. In *version (D)* a one-percent increase in income per unit of labour relatively to the national mean has the strongest effect on migration probability (5.76% increase).[27] Regions with higher unemployment rate deter migrations. This result is in line with previous works on migration using micro-data and confirms the hypothesis that unemployed are particularly sensitive to local unemployment rates.[28] Fast-growing areas experience an above average migration of high-skilled individuals as the positive and significative sign of the variable **GDPPC3Y** confirms. This last effect, according to the estimated parameter, has a rather small magnitude.

The dummy variable for Basilicata is highly significant and positive. As mentioned before, this variable captures the effects of those unobservables characteristics ("home" attachment) for the individuals who have expressed a geographical preference for Basilicata.

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[27] For a hypothetical region with average characteristics in year 2000, this means that an increase in income per unit of labour of Euros 280 (national average was Euros 28.050, in current prices) will lead, ceteris paribus, to a 5.76% increase in the probability of attracting highly educated individuals.

We find that migration probability declines with the distance (in KM) between the origin and potential destination. There is strong support to conclude that this effect is non-linear. The negative effect of distance declines at greater distances (the marginal impact on the probability of migration toward a potential destination is decreasing in distance).

The stock of highly educated migrants from the origin region (***PASTMIGRO_DEGREE***) plays an important role in explaining which location is selected among different alternatives. This variable, as already mentioned, should capture a lower cost of migration towards the potential destination through easier access to information and direct and indirect support. We believe that this variable might also be partly interpreted as a control variable for the quality and quantity of economic opportunities in the destination region since the stocks of past migrants are generally proportional to the size of the population in alternative locations. In migration studies generally regional population or GDP is used as control variables for the same purpose. A larger region has a larger pool of locations to select and therefore potentially more opportunities. In our study these control variables were found not significant. Probably this result is motivated by the fact that the Italian Mezzogiorno is composed of some densely populated regions (such as Sicilia) for which it is hard to believe that population is a good proxy of economic opportunities available to the potential migrants.

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[28] Frequently in migration studies using aggregate data show mixed results on the sign and significativeness of the unemployment rate variable.

Table 4 – Conditional Logit Estimates

Dependent variable: CHOICE	Mod (A)	Mod (B)	Mod (C)	Mod (D)
IPUL	18.164** (18.39)	13.881** (9.88)	7.168** (5.05)	6.060** (3.48)
Unemployment rate	-1.382** (4.96)	-0.767* (2.02)	-0.692* (1.92)	-0.752* (1.68)
GDPPC3Y	0.623** (6.67)	0.299** (2.91)	0.465** (4.24)	0.368** (3.21)
PREF_BASILICATA	1.915** (7.67)	1.583** (6.21)	1.849** (7.60)	1.661** (5.38)
DISTKM	-1.088** (9.55)	-1.415** (8.76)		-0.909** (4.69)
DISTKM2	0.061** (7.47)	0.098** (7.38)		0.071** (4.43)
PASTMIGRODEGREE	1.508** (22.34)	1.675** (18.73)	1.583** (16.69)	1.567** (15.12)
CULT		1.954** (5.66)	1.057** (3.13)	1.436** (3.46)
CRIME1		-4.864** (6.58)	-5.535** (6.62)	-5.078** (5.58)
CRIME2		-0.776** (2.53)	-0.597* (1.95)	-0.800** (2.21)
POPDEN		0.083 (0.55)	0.289* (2.04)	0.292 (1.63)
DISTKMADJ			-1.129** (12.53)	
DISTKMADJ2			0.086** (8.09)	
STAGEDUMMY				2.316** (16.03)
UNIDUMMY				0.966** (6.66)
MASTERDUMMY				0.9795** (7.15)
LL	-1018.88	-985.02	-707.82	-652.99
McFadden's R2	.436	.455	.608	.639
BIC	-1777.79	-1819.90	-2374.30	-2464.74

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%
N = 12060

Table 5 - Conditional logit: Interaction effects

Variables	Version (E)
IPUL	6.207**
	(3.52)
Unemployment rate	-2.139**
	(2.84)
GDPPC3Y	0.40**
	(3.30)
PREF_BASILICATA	1.735**
	(5.54)
DISTKM	-0.790**
	(3.66)
DISTKM2	0.058**
	(3.15)
PASTMIGRODEGREE	1.636**
	(15.30)
CULT	1.467**
	(3.48)
CRIME1	-5.421**
	(5.82)
CRIME2	-0.890**
	(2.42)
POPDEN	0.303*
	(1.68)
STAGEDUMMY	2.110**
	(12.96)
UNIDUMMY	0.592**
	(2.40)
MASTERDUMMY	1.237**
	(7.59)
City*DISTKM	-0.242*
	(1.71)
City*DISTKM2	0.027*
	(1.87)
City* UNIDUMMY	0.595**
	(1.95)
MARK*unemployment rate	0.033**
	(2.17)
MLAW*unemployment rate	0.585**
	(1.99)
MLAW* MASTERDUMMY	-0.839**
	(2.71)
MLAW* STAGEDUMMY	0.884**
	(2.53)
MENG* UNIDUMMY	1.193**
	(2.69)
MARTS* MASTERDUMMY	1.257**
	(2.16)
LL	-629.86
McFadden's R2	0.651
Absolute value of z statistics in parentheses * significant at 10%; ** significant at 5%; N,=12060; BIC=-2453,30	

Along with economic opportunities, *quality of life* is a considerably important aspect that should be taken into account by regional policymakers who aim at making their locations attractive to talented individuals. The weight attached to these amenities is considerable. Crime is a strong push factor. This is particularly true for highly educated individuals who are generally more footloose and therefore able to "react" easily to such disamenities by relocating in more safe areas. In our model the combined negative effects of **CRIME1** and **CRIME2** are remarkably high. Diffused criminality discourages potential location decision by talented individuals and investors. Finally, population density (**POPDEN**) has a weak positive effect on migration probability suggesting that highly skilled individuals are attracted toward more urbanised areas where agglomeration forces are strong and it is easier to have access to a more variegated and sophisticated bundle of goods and services. This result should be taken with caution since the variable appears not significant in some versions of the model.

4.4 The relevance of personal characteristics: some interaction effects

In the conditional logit the effect of personal characteristics on migration cannot be directly investigated, but we need to interact these variables with place characteristics. The results of the analysis of the importance of personal characteristics are presented in *table 5*.

Interactions between the dummy variable **CITY** and **DISTKM, DISTKM2** and **UNIDUMMY** are found significant. As we have seen in the logit model, individuals who live in a larger agglomeration have a lower probability to migrate. The negative effect of distance for those born and living in a city is stronger and significative at the 10% level. A potential destination which is 100 km further away from a region with average distance from Basilicata (520 km circa) has a probability of being selected which is –0.56% lower for those born in a city and –0.46% lower for those who are not. The interaction between **CITY** and **UNIDUMMY** has a positive sign, significant at 10% level. For these individuals the probability of remaining in the same region where university was attended is higher. With regard to this, we speculate that the choice of

university location for these individuals already probably discounts a certain amount of inertia.[29]

The interaction between the mark obtained at the end of bachelor's degree and the unemployment rate (*MARK*Unemployment rate*) is positive and significant. This result indicates that the most able individuals among the sample are deterred less from areas with a higher unemployment rate. This is not surprising since these individuals are more able to compete in the job-market even in local economies with a reduced set of opportunities.[30] Finally we study the effects of the subject of master studies on migration probabilities. Individuals with post-graduate education in law and political science are less discouraged by high unemployment area (*MLAW* Unemployment rate*). A considerable share of these individuals will continue the training to become lawyers or fiscal advisors after the university and master. In Italy, for these professions a training period of two to three years after the bachelor's degree is required. For this reason a apprenticeship period is compulsory for embarking on these careers. Generally it is easier to obtain it in a location where the individual has strong personal connections. This explains the positive interaction of *MLAW* (master in law and political science) with *UNIDUMMY* and *STAGEDUMMY*, and the negative interaction with *MASTERDUMMY*. The period of time spent during the master is probably not enough to build the necessary connections to get a apprenticeship position.

Individuals with a degree in engineering or architecture (*MENG*) are more likely to locate in the region where their university course was held, while the region where the master was attended is more important for individuals with education in literature studies, languages and arts in general (*MARTS*). We also found weak support for the fact that individuals with a more business oriented educational background are more likely to migrate toward more densely populated areas.

It is worth mentioning that the migration behaviour with respect to gender does not show any significant difference in the conditional logit. The interaction effects of the dummy variable *MALE* were all statistically insignificant.

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[29] A tabulation of the two variables confirms that individuals born in Matera and Potenza are slightly more likely to study in a "home" university.
[30] The introduction of this variable significantly reduces the standard error estimate for the unemployment rate measure in the model.

5. *Final comments*

Migration literature points out that the migration propensity of highly skilled and educated individuals is higher when compared with the rest of the population. To our knowledge, few studies conduct an in depth investigation into the factors explaining the geographical pattern of their decision.

In this paper we focus our attention on the micro-level location decisions of highly skilled and educated individuals, one of the most important resources in modern economies. We employ data on a sample of individuals residing in a small peripheral Italian region (Basilicata) who have benefited from a locally funded human capital investment policy. Our results show that even within a quite homogeneous group of individuals, there are personal characteristics which largely affect migration propensity.

Knowledge of the factors explaining the location decision of talented individuals is of considerable interest, in particular in the light of an increasing regional economic integration which makes this group of individuals extremely footloose.

As highlighted in this paper, among the factors explaining individuals' location decision, quality of life is a very important. For this reason policy interventions aimed at improving quality of citizens' life should be regarded as very attractive. Diffused criminality discourages potential location decisions by talented individuals and investors. We believe this is a quite important factor explaining the poor economic performance for some areas of the Italian Mezzogiorno, which otherwise should be considered particularly attractive given the high quality and large quantity of human capital available. This consideration is not intended to discount the importance of regional economic performance, which should be considered as a pre-requisite for attracting highly skilled and talented individuals. We want to emphasise that improving quality of life can lead to a substantial pay-off in terms of future growth and prosperity of peripheral regions.

Finally, we are able to assess the relative importance of the availability of information on potential destinations for the individuals' migration decision process. Lack or poor quality of information on local economic opportunities represents a market failure that can be, at least partly, corrected by adequate policy measures. Actions aimed at this purpose might, therefore, be considered as strategic in trying to maintain and attract human capital.

References

Antolin, P. and O. Bover, 1997, Regional migration in Spain: the effect of personal characteristics and of unemployment, wage and house price differentials using pooled cross-section, Oxford Bulletin of Economics and Statistics 59, 215-235.

Borjas, G., 1987, Self-Selection and the Earning of Immigrants, American Economic Review 77, 531-553.

Borjas, G., S. G. Bronars and S. J. Trejo, 1992a, Assimilation and the earnings of young internal immigrants, Review of Economics and Statistics 74, 170-175.

Borjas, G., S. G. Bronars and S. J. Trejo, 1992b, Self-Selection and internal migration in the United States, Journal of Urban Economics 32, 159-185.

Carrington, W., E. Detragiache and T. Vishwanath, 1996, Migration with Endogenous Moving Costs, American Economic Review 86 (4), 909-930.

Coniglio, N. D., 2003, Regional Integration and Migration: an Economic Geography Model with Heterogeneous Labour Force, Glasgow University Department of Economics Discussion Paper series, n.1/2003.

DaVanzo, J., 1978, Does unemployment affect migration? Evidence form microdata, Review of Economics and Statistics 60, 504-514.

DaVanzo, J., 1983, Repeat migration in the United States: who moves back and who moves on?, Review of Economics and Statistics 65, 552-559.

Davies, P., Greenwood M. and H. Li, 2001, A Conditional Logit approach to U.S. State-To-State Migration, Journal of Regional Science 41, 337-360

Farber, S. C., 1978, A directional flow migration model, Southern Economic Journal 45, 205-217.

Florida, R., 2002, Bohemia and Economic Geography, Journal of Economic Geography 2 (1), 55-71.

Friedman, J., Gerlowski D. and Silberman J., 1992, What Attracts Foreign Multinational Corporations? Evidence from Branch Plant Location in the United States, Journal of Regional Science 32, 403-418.

Gathak, S., Levine P. and Price S. W., 1996, Migration theories and evidence: an assessment, Journal of Economic Surveys 10 (2), 159-198.

Glaeser, E. L., Kolko J. and Saiz A., 2000, Consumer City, NBER Working Paper Series, n. 7790, July.

Greenwood, M. J., 1969, An Analysis of the Determinants of Geographic Labor Mobility in the United States, Review of Economics and Statistics 51 (2), 189-194.

Herzog, H. W. and Schlottmann A. M., 1981, Labour force migration and allocative efficiency in the United States: the role of information and psychic costs, Economic Inquiry 19, 459-475.

Herzog, H. W. and Schlottmann A. M., 1984, Labour force mobility in the United States: migration, unemployment, and remigration, International Regional Science Review 9, 43-58.

Herzog, H. W., Schlottmann A. M., Boehm T. P., 1993, Migration as spatial job-search: a survey of empirical findings, Regional Studies 27 (4), 327-40.

Hughes, G. A. K. and McCormick B., 1989, Does migration reduces differential in regional unemployment rates?, in: J. Van Dijk, H. Folmer, H. W. Herzog and A. M. Schlottmann, eds., Migration and labour market adjustment (Kluwer, Dirdrecht).

Ledent, J., 1990, Canada, in: C. B. Nam, W. J. Serow and D. F. Sly, eds., International handbook on internal migration (Greenwood Press, New York).

Long, L., 1992, Changing residence: comparative perspectives on its relationship to age, sex, and marital status, Population Studies 46, 141-158.

Justman, M., Thisse J. F., 1997, Implications of the mobility of skilled labor for local public funding of higher education, Economic letters 55, 409-412.

Krugman, P., 1991, Increasing Returns and Economic Geography, Journal of Political Economy 99, 483-499.

Lucas, R. E., 1988, On the Mechanics of Economic Development, Journal of Monetary Economics 22, 3-42.

McFadden, D., 1973, Conditional Logit Analysis of Qualitative Choice Behaviour, in: P. Zarembka, eds., Frontiers in Econometrics (Academic Press, New York).

McHone, W. W. and Rungeling B., 1993, Replacement income, duration of unmeployment and the migration, Applied Economics 25, 905-909.

Molho, I., 1987, The migration decisions of young men in Great Britain, Applied Economics 19, 221-243.

Molle, W. T. M. and van Mourik A., 1989, A static explanatory model of international labour migration to and in Western Europe, in: Gordon I. and Thirwall A. P., eds., European factor mobility: trends and consequences, (Macmillan, London).

Otomo, A., 1990, Japan, in: C. B. Nam, W. J. Serow and D. F. Sly, eds., International handbook on internal migration, (Greenwood Press, New York).

Pissarides, C. A. and Wadsworth J., 1989, Unemployment and the inter-regional mobility of labour, Economic Journal 99, 739-755.

Plane, D. A., 1993, Demographic Influences on Migration, Regional Studies 27, 375-383.

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

Robinson, C. and Tomes N., 1982, Self Selection and Interprovincial Migration in Canada, Canadian Journal of Economics 15, 474-502.

Schultz, T. W., 1962, Reflections on Investment in Man, Journal of Political Economy 70 (2), 1-8.

Schwartz, A., 1973, Interpreting the Effect of Distance on Migration, Journal of Political Economy 81 (5), 1153-1169.

Temple, J., 2001, Growth effects of Education and Social Capital in the OECD Countries, OECD Economic Studies 33, 57-101.