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 a small peripheral Italian Mezzogiorno region (Basilicata) who have benefited from a locally funded human capital investment policy. In particular we shed light on the following questions: (1) Who are the migrants?; (2) Which are the main factors influencing migration of talented individuals?; (3) Which are the factors which make a region attractive for those individuals?

The sample under analysis is a natural experiment for assessing both the effectiveness of locally financed human capital investment policy and the factors affecting the location decision of highly educated individuals in an economy presenting all the features of a core-periphery structure.

Keywords: Education, Geographical Labour Mobility, Interregional Migration, Conditional Logit, Human Capital.

JEL-classifications: I28, J61, R23

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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 policy-makers. In his seminal paper "Reflections on Investment in Man", Schultz (1962) 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 product, therefore, of individual investments in education and job-training activities.

The relevance of human capital in modern economies[1] and the divergence between its private and social returns justify public policy interventions aimed at subsidising human capital accumulation. As Justman and Thisse (1997) have pointed out, the public benefit 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. Regional integration of labour markets may increase the incentive of workers to spatially relocate, in particular from peripheral to central regions. If migration flows are both considerable and persistent, policy makers have to take this aspect into account when designing the policy measures aimed at fostering human capital in lagging-behind regions.

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 a small peripheral Italian Mezzogiorno region (Basilicata) 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 90s to young graduates who want to attend a post-graduate course both inside and outside the region. More than a thousand individuals have benefited from this policy in the last decade and the target for the period 2000-2006 is to subsidise an additional two thousand individuals.

The sample of individuals under analysis is far from being representative of the regional population. The policy intervention under scrutiny, and in particular 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 EU 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

[1] Rapid technological changes in production processes imply a steadily increasing demand for skilled knowledge workers. According to some scholars (Florida, 1995) a new industrial revolution has emerged where knowledge is a vital resource and learning is the most important process. The emerging knowledge-intensive capitalism is seen as an evolution from the previous Fordist system (from the end of World War II to the early 70s), where "intelligence and intellectual labour replace physical labour as the fundamental source of value and profit" (Florida, 1995).

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 the first employment to the 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 exploits maximum likelihood estimation with a binomial 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. Even if the sample under analysis is quite homogeneous in terms of educational level, we find that individuals show a different migration propensity on the basis of gender, size of the area of origin, typology of educational background and in particular their past migration experiences mainly for educational purposes. It is worth noticing, for its policy implications, that attending a post-graduate course at home significantly increases the probability of maintaining the human capital generated.

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. This methodological approach has sound microeconomic foundations since it is derived from individual utility maximisation in the framework of a random utility model.

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.

The results of our empirical estimation lead to several issues of economic policy relevance. 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 results have strong policy implications for the local economy under analysis. Besides, in our opinion the findings have a general validity for regions facing similar circumstances, such as many peripheral regions across Europe. The sample under analysis is a natural experiment for assessing both the effectiveness of locally financed human capital investment policy and the

factors affecting the location decision of highly educated individuals in an economy presenting all the features of a core-periphery structure.[2]

The structure of the paper is the following. In *Section I*, we briefly outline the theoretical background of the study. In *Section II*, we describe in more detail the regional policy implemented, the conduct of the survey and a description of the sample. In *Section III*, the logit model is presented and the results are discussed. The conditional logit analysis is presented in *Section IV*. Finally, *Section V* contains the concluding remarks of the paper.

2 – Human Capital Investment and Migration

The emergence of endogenous growth theory at the end of the 80s has given further strength to the idea that the accumulation of human capital has a highly beneficial effect on economic growth and development (Romer, 1990; Lucas, 1988). Recent empirical evidence is supportive of this idea (Rauch, 1993; Glaeser and Marè, 2001; Ciccone and Peri, 2002). Besides, many case studies investigating the sources of success in some booming regional economies emphasise the key role of an educated and highly skilled workforce (Bresnahan *et al.*, 2001).

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 (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".

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. The expected public benefits of these human capital investments are not necessarily enjoyed by the taxpayers that have contributed to fund them. The scope for the policy might vanish if the human capital formed locally is lost through migration, as emphasised by the "brain drain" literature. Local resources devoted to fostering human capital in the local economy are lost and the positive human capital externalities benefit the destination region, which, in general, is a rich "central" region. 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).

Besides, the incentive to migrate is not homogeneous across different groups of the population. Younger, more talented individuals have a higher propensity to migrate. A positive self-selection is a stylised fact in 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). The loss of the most valuable residents, the main source of innovation and productivity in a modern economy, contributes to explain the persistent nature of regional economic imbalances.[3]

For the regional authorities, therefore, the central point is not only how to increase the ability of the "regional system" to generate highly skilled individuals, but also how to maintain

[2] Of course, as with all case studies, the results should be critically generalised to other situations. Nevertheless, it is likely 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.

[3] It should be recognised that if migration occurs between regions within a country and human capital formation is financed by the central governments, the relevance of this effect is reduced. Geographical mobility of high-skilled individuals within a country is an efficient response to regional labour market imbalances. The gain experienced by the destination region might more than offset the loss experienced by the origin region. In theory it could be possible to compensate losers through redistributive policies such that all individuals in the economy are better off.

and attract them. This is one of the main outcomes of our analysis, the policy implications of which are valid not only for the local economy under analysis, but also for regions with a similar economic structure such as many peripheral regions across Europe.

The central role of highly skilled workers in modern economies is recognized also by the European Commission, which has made a firm commitment to pursue policies aimed at fostering human capital and mobility across the Union (European Commission, 2001; 2002). The efficiency gains arising from increased geographical labour mobility and in particular from enhancing the educational and skills level are unquestioned. However, some concerns arise when considering another important priority advocated by the EU Commission, that of promoting growth in lagging-behind regions.

"11) Particular attention should be given to greater investment needs in human capital and ICTs [Information and Communication Technologies], in particular in Member States and regions that are lagging behind, and to ensure the efficient and productive use of such investment. This will be even more important in the new Member States" (European Commission 2002, p. 16).

The potential negative effects caused by the emigration of high-skilled individuals from these peripheral regions are barely recalled in the High Level Task Force's final report, that states:

"(t)here is, however also a danger that greater mobility may make disparities worse, as those with some skills may move out to other regions with demand for those skills." (p. 13).

However the recognition of this potential brain drain problem has completely disappeared from the final text of the European Commission: in the long list of actions to be taken, none consider this potential outcome.

In order to address these complex and important issues it is important to shed further light on the factors shaping the geography of human capital. It is necessary to improve our knowledge about the micro-level migration decision of talented and skilled individuals. The analysis conducted in the following sections goes in this direction.

3 - 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 postgraduate course in a Higher Educational Institution (HEI).[4] 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. [5] 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 the first employment to the current employment status. The survey was conducted during May-July 2002. The questionnaire was sent to all the

[4] Postgraduate 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.

[5] Available upon request to the corresponding author.

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[6]. A total of 740 individuals returned the questionnaire, approximately 70% of the total. After deleting observations for several reasons, the final sample contains 700 observations.

Sample selection problems arise when the sample studied represents a sub-group which is not representative of the entire population whose behaviour is under analysis. Given the nature of our sample, young and highly educated individuals, our results are intended to be generalised to the fraction of the population composed only by highly talented and skilled individuals in peripheral regional economies such Basilicata. The most likely cause of sample selection problems in micro-data based migration studies are the following (see also Greenwood, 1997): (1) *sampling design and population coverage*; (2) *time-dependent disturbances* and (3) *different rate of response to the survey*. We briefly comment, using the same order, the relevance of this problem for the data employed in this work. With regard to the first point, as previously said, our analysis is conducted on highly educated individuals who have benefited from a measure of regional policy aimed at financing individuals' human capital formation. These individuals represent the upper tail of the regional population educational attainment distribution, in principle this sample is a good proxy for the targeted population we aim to analyse[7].

The decisional tree for an individual wishing to obtain policy support is the following (see diagram 1). In **stage 1**, highly educated individuals might apply or not to the regional authority in order to get financial support for further investment in human capital accumulation. Since the regional authority imposes no requirements on the typology and location of the course that could be attended and given the high public knowledge about this policy intervention, the potential problem of sample selection at this stage is rather small. Probably those individuals with very high costs associated with a further investment in human capital will not apply, but this is exactly what we want, include only talented and skilled individuals. In **stage 2**, an individual who has applied might be accorded funds or not. The selection criteria imposed by the regional authority concern educational attainment of the candidate and the "quality" and reputation of the educational institution which offers the courses[8]. Again the policy is selective toward high quality candidate. We argue, therefore, that the sample under scrutiny (right-side of the decisional tree at **stage 3** is representative of the population of young and highly educated individuals to which our attention is focused.

The problem of time dependent disturbances is probably not very serious since we consider individual migration decision over a decade. Even if changes are possible in the general pattern of migration we do not expect them to be dramatic. Besides, in the second part of our investigation (conditional logit model) we remove the problem by using time-dependent explanatory variables**.**

With regard to the third point, the questionnaire was sent to **all** the beneficiaries of the policy from its start in 1991 until 2001. This amounts to around one thousand individuals. Since

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

[7] The number of observations at our disposal is considerable if related to the total regional population that in the last census was slightly less than six hundred thousands (individuals between 25-29 years were 48 thousands in 1997).

[8] These regulations are aimed at avoiding courses of questionable quality. An applicant with a successful educational record willing to embark upon further investments in education will very likely obtain regional support. The rejection rate is very small and mainly based on considerations that pertain to qualitative aspects of the course chosen by the individual.

the rate of response to our postal survey was considerable (70%), we are lead to believe that a strong selection bias due to non-responses is very unlikely.[9]

The individuals in our sample have a bachelor's degree and are resident in Basilicata at the time when they applied to receive funding.[10] The average age at the moment of attending the Master courses is 27.5. 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, 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)[11]. Even if not directly comparable, it is worth noting that the migration propensity in our sample of highly educated individuals, calculated with the same index would be 587.1.[12]

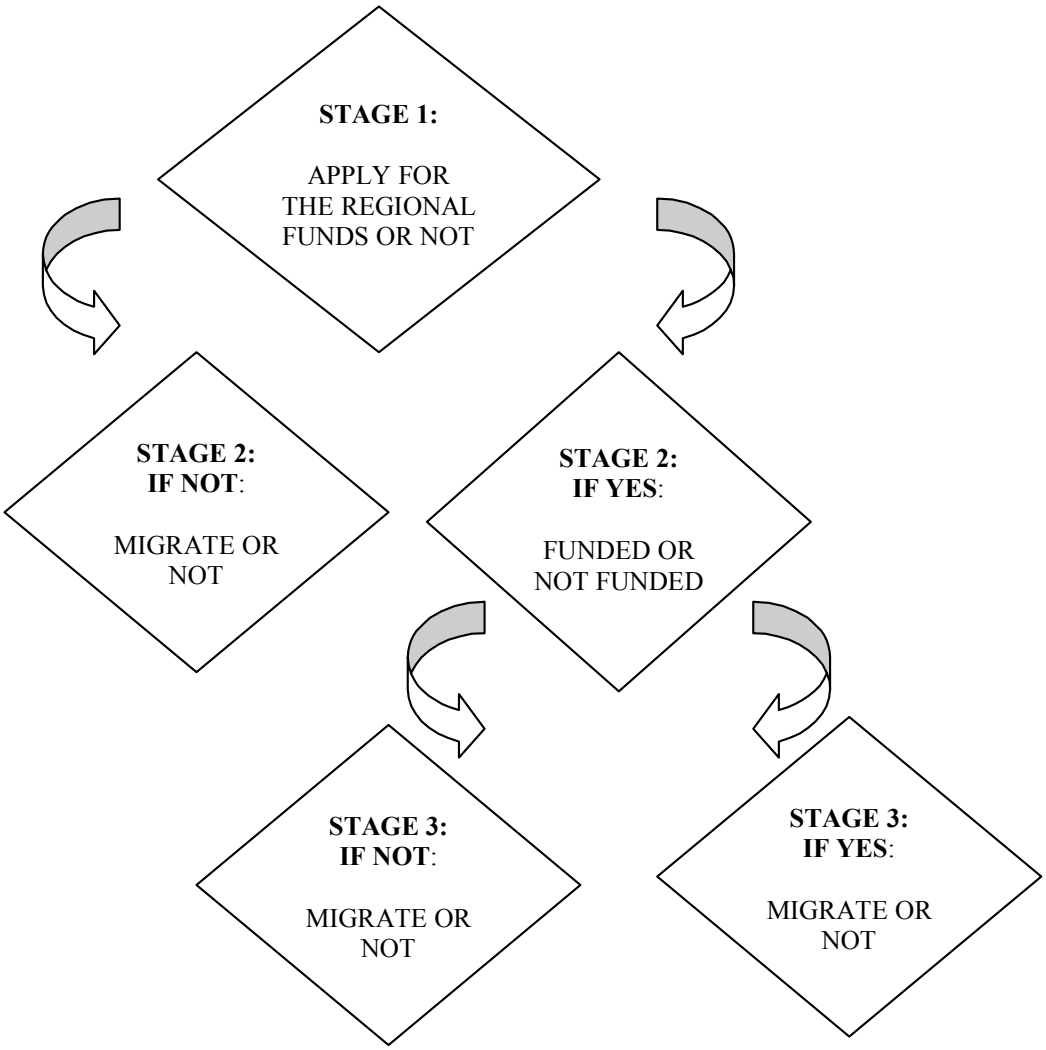
[9] An investigation into the causes of non-response was conducted by tracking a number of non-respondents. Apart from the usual inertia in answering to postal survey, a relevant share of the non-responses was due to inaccurate transcription of individual postal addresses in the documentation provided by the regional authority.

[10] There is a small group of people (35 individuals) who get a high school diploma.

[11] Note that in our sample the average age is 27.5 with a standard deviation of around 2.5 years.

[12] One of the aspects that emerged from our survey is the very high number of individuals who do not officially change their residence even if they work for many years outside the region. It seems that official statistics considerably under-estimate the real migration flows from the South to the North of Italy, in particular for the class of population under analysis. This aspect deserves further investigations.

Diagram 1
Potential sample selection: individual's decisional tree



4 – Who are the migrants?

4.1 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:

$$(1) \qquad U_h^* = \beta_h' x_h + \varepsilon_h$$

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/he will enjoy is given by:

$$(2) \qquad U_f^* = \beta_f' x_f + \varepsilon_f$$

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 the effects of intervening obstacles should be taken into account. Costs of migration are a function of individual characteristics and existing barriers[13]:

$$(3) \qquad CM_{hf}^{\ *} = \alpha' x_c + \varepsilon_c$$

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

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

where *M** is an unobservable variable representing the net benefit from migration. We assume that the disturbance ε has a normal distribution with mean 0 and variance 1. The observed binary individual choice reveals if the net benefit is positive or negative, but not the underlying unobservable utilities. Our observation will be:

$M = 1$ if $M^* > 0$
$M = 0$ if $M^* \leq 0$

[13] 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.

Therefore the probability of migration (*M = 1)* is:

$$\begin{aligned} &\Pr ob\left[M = 1|x \right] = \Pr ob\left[U_f^* - U_h^* - CM_{hf}^* > 0 \right] \\ &= \Pr ob\left[\beta' x + \varepsilon > 0|x \right] \end{aligned} \tag{5}$$

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 by applying a logit model[14].

4.2 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 zero otherwise. We look at individuals' actual location.[15]

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, typology of study, location of university and master studies, eventual internship period after the master, etc.) and about 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, there is a series of personal characteristics (sex, aging, etc.) and a number of life-cycle considerations (marriage, completion of schooling, entry into the labour force, etc.). Two classical features are the relationships between age and migration and between education and migration. Migration propensities generally peak during the mid-twenties and then decline steadily until the retirement age (Plane, 1993). High educational attainments are generally employed as a proxy for individual abilities. Since more talented and able individuals have both lower costs and higher returns from migration, education is positively associated with migration probability. On the basis of these characteristics, individuals in our sample should be considered as highly mobile. We want to test if, even within the sample, variation in these personal characteristics matters in explaining whether individuals are likely to stay or move. To take into account the first relationship we use the variables ***MASTERAGE*** and ***MASTERAGE2***, which are the age at the time of master studies and its square.[16] 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.

[14] 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 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.

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

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

The expected effect of gender (***MALE***) in the relation to the propensity to migrate is not unambiguous (Ritsila and Tervo, 1999).

The variable ***CITY*** allows us to test for significant differences between people born in a city and those born in smaller towns.[17] This is an aspect not well documented in the literature. 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.

The variable ***MARK*** (final mark of the bachelor's degree) is used as a proxy for individual ability. 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. Due to expected collinearity, we cannot use both variables on the typology of the university studies and of master studies. An exception, which does not cause any harm in our analysis, is the inclusion of a dummy variable for people enrolled in a Master in Business Administration (***M_MBA***). We include this variable since we expect these individuals as being particularly mobile.

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 employer, etc.), which reduces the information costs of finding employment opportunities. Besides, knowledge of the local environment reduces the costs of adapting to new environments. Second, individuals who have already moved once could have lower costs associated with a second move. 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 financed, we include a dummy variable ***STAGE*** (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. Besides, 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. [18]

In the questionnaire we asked individuals about the spatial structure of the job-search after completion of the master. One of the questions concerned individual's spatial-preferences.[19] 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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[17] Individuals born in a city are those born in Matera or Potenza, which are the two main urban agglomerations in Basilicata.

[18] 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 those of Potenza and Salerno, on the other side. Besides, 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**.**

[19] The related item in the questionnaire can be approximately translated into English as follows: "At the end of your course, given the availability of the same job opportunities, which would have been your preferred location?" followed by a small list of possible destinations included Basilicata. The individuals were asked to express a first choice and a second choice.

Table 1 – Logit model: description of the explanatory variables

Variable	Description	Scale	Expected sign of effect	Mean	Std. dev.
MALE	1 = male 0 = female	Discrete, dummy	+ / -	0.44	0.49
CITY	1 = born in city 0 = born in a small town	Discrete, dummy	+	0.57	0.49
MASTERAGE	Age at the time of attending Master studies	Continuous, proportional	-	10.47	2.75
MASTERAGE2	Age, as defined above, squared	Continuous, proportional	+ / -	117.28	63.83
MARK	Final mark of the bachelor's degree (between 66 and 110)	Continuous, proportional	-	102.7	8.17
UNI_ECON	1 = degree in business studies 0 = other	Discrete, dummy	+ / -	0.36	0.48
UNI_ENG	1 = degree in engineering or architecture 0 = other	Discrete, dummy	+ / -	0.09	.028
UNI_LAW	1 = degree in law 0 = other	Discrete, dummy	+ / -	0.31	0.46
M_MBA	1 = individual attended a Master course in Business Administration 0 = other	Discrete, dummy	+ / -	0.11	0.31
UNI_NORTH	1 = University attended in North West regions (Piemonte, Lombardia, Toscana) 0 = other	Discrete, dummy	-	0.22	0.41
UNI_CENTER	1 = University attended in Central regions (Lazio, Marche, Umbria) 0 = other	Discrete, dummy	-	0.18	0.38
MASTER_AWAY	1 = Master course attended at "home" (in Basilicata or in the provinces of Bari and Salerno) 0 = other	Discrete, dummy	+	0.75	0.43
STAGE	1 = individual did an internship 0 = other	Discrete, dummy	-	0.79	0.41
STAGE_HOME	1 = internship at "home" (in Basilicata or in the provinces of Bari and Salerno) 0 = other	Discrete, dummy	+	0.15	0.36
NO_PREF_HOME	1 = Basilicata is not the preferred location 0 = other	Discrete, dummy	-	0.64	0.48
UNEM_NOW	1 = unemployed 0 = other	Discrete, dummy	-	0.15	0.36
HIGHMOB	1 = individual changed its jobs more than 3 times between the first and the actual employment position 0 = other	Discrete, dummy	-	0.11	0.31
MASTERYEAR	The year at the time to attend the Master course	Continuous, proportional	+ / -	7.53	2.21

Another personal characteristic we deal with is the unemployment status (***UNEM_NOW***). 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.

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.

4.3 Discussion of the empirical results

Table 2 reports the results of the econometric analysis. Most of the coefficient reach statistical significance and have the expected signs. Since the estimated parameter 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.[20]

It is worth to note that gender variable has a sign that is not in line with previous studies. We find that male individuals are more likely to stay home. This is a very interesting result, even because we know that 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 if they are higher educated. Female are 8.7% more likely to migrate than male.

The effect of ***CITY*** is in line with our assumptions. People born in Matera or Potenza are less likely to migrate (9.4%). 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.[21] Besides, areas densely populated can offer more job opportunities. Individuals from small centres are likely to move anyway for job reasons, for these sub-groups the substitutability between a home or outside location is higher.

MASTERAGE and its square reach statistical significance in explaining migratory behaviour. The sign is in accordance to the literature and to the assumption that the probability to migrate decrease with age. We find support for a non-linear effect of this variable.[22]

The variable ***MARK*** is used as a proxy for individual ability. The negative sign of the estimated coefficient confirms that there is a positive self-selection is migration flows. Even among a group of highly educated individuals, the probability to move is higher for most talented ones. The effect of a change in the value of this variable from its minimum (66) to the maximum value (110) on the probability to stay home is relatively low and amounts to 13.8%.

As said above, we want to check whether individuals with different educational background have a different propensity to migrate. Among the variables, which describe the typology of the university courses attended, we find that ***UNI_ECON*** and ***UNI_ENG*** are

[20] The marginal effects of the independent variables are calculated with respect to a baseline model specified at the mean values for the continuous variable and the most frequent outcome for binary variables.

[21] For instance in terms of selection of restaurant, cinema and in general to a wide set of consumption possibilities.

[22] The effect of this variable on the probability to stay is quite strong. The change in the predicted probability given by a standard deviation change of this variable centred around the mean is of 28%.

significant.[23] 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, 14.4% and 21.5% less likely to stay home than other graduates. The estimated coefficient of ***M_MBA*** is in line with this interpretation. This outcome has strong policy implications: policymakers could be interested in giving priorities to finance typologies of studies more 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 (at home), decreses (increases) the probability of remaining in Basilicata of 22.3%.

The coefficient of the variable ***STAGE_HOME*** captures the effect on the probability to stay of an internship in the "home" location. An internship at home increases the probability of staying by 24%.

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.

The variable ***NO_PREF_HOME***, as we expected, has a strong impact (a marginal effect of 24.3%) and it is very significant.

We find that the effect of personal unemployment (***UNEM_NOW***) on the propensity to migrate is negative, that is unemployed individuals are mainly located in the home region. This outcome is in line with the "contracted" migration view; whose prediction is those individuals migrate with a "job in their hands". It could be explained by the presence of family networks that work like a social security system. Besides, 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 self selection among the individual of our sample, as already shown by the variable ***MARK***.

The hypothesis that more dynamic individuals in the labour market are also more spatially mobile is confirmed by the importance of the variable ***HIGHMOB*** in our study. These people are 13.6% less likely to remain in Basilicata.[24]

[23] The coefficient of ***L_LAW*** is negative, but this variable does not reach statistical significance.

[24] 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	*Coef.*	*Marginal effect*
MALE	0,350 (1,64)*	0,087
CITY	0,379 (1,82)*	0,094
MARK	-0.013 (0,98)	-0,003
MASTERAGE	0,422 (2,42)**	0,104
MASTERAGE2	-0.017 (2,26)**	-0,004
L_ECON	-0,583 (-2,09)**	-0,144
L_ENG	-0,868 (-2,07)**	-0,214
L_LAW	-0,050 (-0,18)	-0,012
UNI_NORTH	-0,123 (-0,49)	-0,030
UNI_CENTER	-0,226 (-0,79)	-0,056
M_MBA	-0,534 (-1,54)	-0,132
MASTER_AWAY	-0,901 (3,16)**	-0,223
STAGE	-0,515 (-2,03)**	-0,127
STAGE_HOME	0,972 (2,98)**	0,240
NO_PREF_HOME	-0,982 (-4,81)**	-0,243
HIGHMOB	-0,550 (-1,66)*	-0,136
UNEMP_NOW	3,519 (7,87)**	0,871
MASTERYEAR	-0,210 (-4,45)**	-0,052
Constant	1,338 (0,85)	
N. Observations	700	
LL	-323.63	
Pseudo R2	0,318	
Absolute value of z statistics in parentheses		
*** significant at 10%; ** significant at 5%**		

The estimated coefficient of ***MASTER_YEAR*** is significant and negative. The probability to migrate is increasing along the time span we are considering. 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.

5 - Where do migrants go? A conditional logit model

5.1 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. Even if we recognise that for some individuals the decision might be sequential, we believe that this latter behavioural assumption is more close to reality and therefore adopt for our study a conditional logit model. Methodologically this assumption on individual behaviour leads to a conditional logit model.[25]

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:

$$U_{ij} = \beta' X + e_{ij} \qquad (6)$$

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.[26] McFadden (1974) demonstrates that if

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

[26] 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

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:

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

where *K* is the number of alternative locations. 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.[27] 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.

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 eq. (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:

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

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.

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incorporated using interaction terms and a fixed-effect (a dummy variable equal 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.

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

Normalisation has further advantages: (i) allows us to remove the national growth trend for the independent variables over the period considered; (ii) we are able to take into account the uneven pattern of growth across Italian regions; and (iii) independent variables used in the estimation have similar scale reducing computational problems.

5.2 Description of the data and variables influencing migration

The data on individual migration decision are derived from the postal survey as described in section 3. 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 never found employment and those migrated to a foreign destination. [28] 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.[29] 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 actual employment is considerably small.

Table 3 and the relative figure illustrate the regional distribution of the human capital "generated" by the local policy measure. Only the 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 Lombardy (mainly in the area of Milan) and Latium. In this section we aim at a more in depth investigation on the regional characteristics affecting individuals' location decision. The decision took place during the period 1991-2001. 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 4. 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).

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 (***UNRATE***) 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***) is order to test whether individuals are attracted toward regions outperforming the national growth trend. This variable is aimed at capturing the recent dynamics

[28] 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.

[29] In the logit we have looked at actual employment (that is employment at the time when the survey was conducted).

of the regional economy rather that 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 from a policy perspective 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 at 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 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.[30] 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 we use ***CRIME2***, which measure the number of violent episodes of crime per 10,000 inhabitants.

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

Table 3: Regional distribution of beneficiaries of policy intervention after the end of the course: first employment

Region	N. of individuals	Percentage
Piedmont	22	3,6
Valle d'Aosta	0	0
Lombardy	164	27,2
Trentino Alto Adige	4	0,7
Veneto	15	2,5
Friuli	2	0,3
Liguria	3	0,5
Emilia Romagna	33	5,5
Tuscany	28	4,6
Umbria	1	0,2
Marche	2	0,3
Latium	109	18,1
Abruzzi	2	0,3
Molise	0	0
Campania	18	3,0
Puglia	35	5,8
Basilicata	165	27,4
Calabria	0	0
Sicily	0	0
Sardinia	0	0
	603	**100**

Table 4 - Variables employed in the conditional logit

Variable name	Variable description	Expected sign	Source
CHOICE	Dummy variable; location choice variable equals 1 for the region where **first employment** was obtained	dependent variable	Questionnaire
IPUL	Income per unit of labour (employee) (current Euro)	+	Istat (various years)
UNEMRATE	Regional unemployment rate (%)	-	Istat (1993-2001)
GDPPC3Y	Growth rate of the regional Gross Domestic Product (3 years)	+	Our calculations on ISTAT data (various years)
Pref_Basilicata	Region specific dummy variable; equals 1 for Basilicata in the choice set if the individuals has 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 (various years)
CULT	Expenditure per capita 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 (1995-1999)
CRIME1	Percentage of micro-crime offences out of the total number of declared offences	-	Istat (1995-1999)
CRIME2	Number of violent episodes of crime per 10000 inhabitants	-	Istat (1995-2000)
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 ***PASTMIGRO_DEGREE***, 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.[31] 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 individuals move from the region of origin, and (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, highly educated and skilled individuals, 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.

[31] 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.

5.3 Discussion of the Empirical Results

The results of the conditional logit estimations are presented in table 5. 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 the *s*th 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 4 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 4 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. Action aimed at this purpose might also be considered as strategic in trying to maintain and attract human capital.

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 (***IPUL***) relatively to the national mean has the strongest effect on migration probability (5.76% increase).[32] Regions with higher unemployment rate deter migrations (***UNEM***). 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.[33] Fast-growing areas experience an above average migration of high-skilled individuals as the positive and significative sign of the variable ***GDPPC3*** confirms. This last effect, according to the estimated parameter, has a rather small magnitude.

The dummy variable for Basilicata (***PREF_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.

We find that migration probability declines with the distance (in KM) between the origin and potential destination (***DISTKM***). There is strong support to conclude that this effect is non-linear since ***DISTKM2*** is found to be positive and statistically significant across all regressions. 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. Also for this second effect the expected sign of the coefficient is positive. 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 Sicily) for which it is hard to believe that population is a good proxy of economic opportunities available to the potential migrants.

[32] 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.

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

Table 5 - Conditional Logit Estimates				
	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)**
Distance in KM	-1,088 (9,55)**	-1,415 (8,76)**		-0,909 (4,69)**
Distance in KM squared	0,061 (7,47)**	0,098 (7,38)**		0,071 (4,43)**
Past migrants (bachelor degree)	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)**
CRIME"		-0,776 (2,53)*	-0,597 (1,95)	-0,800 (2,21)*
Population Density		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)**
UniMasterDUMMY				
LL	-1018,88	-985,02	-707,82	-652,99
McFdden's R2	,436	,455	,608	,639
BIC	-1777,79	-1819,90	-2374,30	-2464,74

Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1% / N = 12060

Table 6 - Conditional logit: Interaction effects

Variables	Version (E)
IPUL	6,207 (3,52)**
Unemployment rate	-2,139 (2,84)**
GDPPC3Y	0,64 (3,30)**
pref_basilicata	1,735 (5,54)**
Distance in KM	-0,790 (3,66)**
Distance in KM squared	0,058 (3,15)**
Past migrants (bachelor degree)	1,636 (15,30)**
CULT	1,467 (3,48)**
CRIME1	-5,421 (5,82)**
CRIME"	-0,890 (2,42)*
Population Density	0,303 (1,68)
StageDUMMY	2,110 (12,96)**
UniDUMMY	0,592 (2,40)*
MasterDUMMY	1,237 (7,59)**
City*distance	-0,242 (1,71)
City*distance2	0,027 (1,87)
City*unidummy	0,595 (1,95)
Mark*unemployment	0,033 (2,17)*
MLaw*unemployment	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 5%; ** significant at 1%; 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. A lively and stimulating cultural environment is an increasingly important aspect of our life. 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 congested 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.

5.4 The relevance of personal characteristics: some interaction Effects

In the conditional logit the effect of personal characteristics on migration can probability not 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 6.

Interactions between the dummy variable ***CITY***[34] 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 100km further away from a region with average distance from Basilicata (520km 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.[35]

The interaction between the mark obtained at the end of bachelor's degree and the unemployment rate (***MARK*UNEMPLOYMENT***) 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.[36] Finally we study the effects of the typology 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***). 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.

[34] This variable is equal to 1 if the individual was born in one of the two main urban agglomeration in Basilicata (Potenza and Matera, respectively capital of the two provinces in Basilicata) and zero otherwise.

[35] A tabulation of the two variables confirms that individuals born in Matera and Potenza are slightly more likely to study in a home university.

[36] The introduction of this variable significantly reduces the standard error estimate for the unemployment rate measure in the model.

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***.[37] 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 (***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.[38]

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 not significant.

6 - Final comments

Migration literature points out that the migration propensity of highly skilled and educated individuals is higher when compared to 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. This is of particular interest for local (and national) policymakers in peripheral regions who whish to capitalise on this important source of economic development. We emphasise, by mean of this case study, the importance not only to implement local policy aimed at fostering human capital accumulation but also to maintain and attract it.

Regional policymakers should put more effort into designing human capital investment policies tailored to the needs and requirements of the local economy. Involving local economic actors in the process of human capital formation under the guidance of a broad economic development plan is essential. This will make the policy more effective in delivering the expected beneficial externalities to those taxpayers that have contributed to finance human capital accumulation.

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

[37] These professions in Italy often represent a family business. Given the high barrier to entry, it is very common to see members of the same family taking over the business from older relatives.

[38] This last interaction effect was significant in some specification of the model not showed here but in *version (E)*.

Mezzogiorno, which otherwise should be considered particularly attractive given the high quality and large quantity of human capital available. Compared with other economic determinants affecting migration decision, these variables are relatively more easily under the control of the regional authorities. 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.

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