**Do institutions play a role in skilled migration? The case of Italy\***

Annamaria Nifo[[1]](#footnote-2)♥ & Gaetano Vecchione[[2]](#footnote-3)♣

**Abstract**

The factors identified by economic theory as determining migrants’ decisions appear less relevant to the choices of the *highly skilled*, a fairly small but significant group which is able to wield a major economic impact on regional economies. This paper is based on the idea that in their migration choices the highly skilled are motivated to look for an area or context able to ensure a higher income and better employment opportunities. At the same time, it should be a favourable socio-economic environment with well-functioning local government institutions. The decisive impact of institutional quality on the level of services, the environment, regional development and the overall quality of life in the destination area has been extensively studied in the literature. Building on such previous studies, by using data from the “Survey on the professional recruitment of graduates” in Italy conducted by the National Statistics Office (ISTAT) in 2007 on a sample of 47,300 individuals who graduated in 2004, we study the impact of provincial institution quality on the probability of resident graduates migrating. Our Heckman Probit estimation indicates that institutions do matter for migration decisions and their importance is comparable to that of per-capita income provincial differences.

**JEL code: J24; O15.**

**Keyword: Skilled Migration, Institutional Quality, Southern Italy.**

**1. Introduction**

For some years there has been growing interest on the part of economists and social scientists in intellectual migrations (i.e. of the highly skilled) alongside the awareness of the role of human capital in economic growth (Lucas, 1988; Romer, 1990) and the empirical importance of the phenomenon. Indeed, while migrations from the South to the North of the world have increased overall from 14 million individuals in 1960 to 60 million in 2000 (Ozden et al., 2011), estimates by Defoort (2008) indicate that at the global level, between 1975 and 2000, the number of graduate migrants at least quadrupled. The ratio of highly skilled migrants (with at least 13 years spent in training) to average migration is thus 2.7 for the Philippines and Eastern Europe, 3.2 for Romania, 11 for India and as high as 19 for China (Docquier and Marfouk, 2006).

Many theoretical and empirical studies have focused on the analysis and assessment of pull and push factors of highly skilled workers. In general terms, much has been written on the motivations underlying migrations. The fundamental determinants have been identified in factors such as the unemployment rate, available income, the economic structure, the age structure of the population, population density, the index of living costs, and property prices. In brief, theory predicts that rational individuals move when they expect to receive from migration an increase in overall net future earnings (Sjaastad, 1962; Harris and Todaro, 1970). The decision to migrate is thus based on a cost-benefit assessment (Borjas, 1999) of the economic benefits of moving to the area of destination, net of transfer costs (Venturini, 1991 and 2004; Brucchi Luchino, 2001).

However, the emphasis laid on the prevailing theory on purely economic factors to explain migration decisions would appear to apply less in the choices of the highly skilled, a relatively small but qualitatively significant group of migrant workers able to wield a major economic impact on regional economies (Saxenian, 2006). In their decisions to migrate, what appears to be important is other aspects and characteristics of destination areas. Alongside strictly economic determinants behind migration choices, in this case an appreciable weight is acquired by social, cultural and institutional factors.

Theoretical reflection and empirical research on the relation between skilled migration and its determinants have generated an extensive literature. Still today, it is of extreme importance to ascertain, in precise socio-institutional contexts, the weight of push and pull factors that generate migrations of the highly-skilled. In the Italian case, for example, pin-pointing the reasons for interregional migrations of highly-skilled workers could be the key to understanding the recent flow of human capital from the *Mezzogiorno*[[3]](#footnote-4) toward central and northern Italy and to some extent the possible negative effects on development in southern Italy.

From a more strictly individual point of view, there is no longer any doubt that the decision whether or not to migrate is influenced by the desire to live in geographical areas that ensure better job opportunities, but also (and in many cases, especially) by the prospect of a higher “quality of life”, understood as the overall product of a mix of economic, social and cultural factors related to economic welfare, job opportunities, social mobility but also with the efficiency of institutions, greater availability and quality of services and infrastructures, effectiveness of the judiciary and public administration, better protection of property rights, public order, widespread civic sense, etc. According to this line of thought, underlying the migration choices of the highly skilled is firstly the search for a geographical area capable of ensuring not only a higher income and better job opportunities, but also a favourable socio-economic context whose hallmark is trust, sense of belonging and social capital. Accordingly, working as push and pull factors are a set of highly area-specific elements which are hard to reproduce, based above all on intangible assets: on the local network more than on capital accumulation (Camagni and Capello, 2008), on interaction and knowledge enhancement made possible by cooperative learning processes, on atmosphere effects,the result of the happy combination of institutions, regulations, practices, productive fabric, researchers and policy makers which work together to determine an area’s capacity to capture development opportunities (North, 1990; OECD, 2001).

The decisive impact which institutions may have on the quality of services, the environment, efficiency and development of an area, and generally their ability to lead to a better overall quality of life in the region of destination, have been the focus of a broad strand of the economic literature: many studies have emphasized the role of institutional differences as a key factor in explaining the causes of growth and stagnation (La Porta et al., 1998; Hall and Jones, 1999; Acemoglu et al., 2001; Djankov et al., 2002; Easterly and Levine, 2003; Glaeser et al., 2004; Rodrick et al., 2004; Kwock and Tadesse, 2006). By contrast, the role of institutions in determining the attraction of an area for human capital has received less theoretical treatment and is less proven.

The aim of this paper is to estimate the weight of the quality of institutions as one of the main determinants - economic and otherwise – of internal migration flows of human capital in Italy, so as to supply an interpretation of recently observed dynamics, with particular reference to migration decisions of graduates censused in the “Survey on the professional recruitment of graduates” in Italy conducted by the National Statistics Office (ISTAT) in 2007 on a sample of 47,300 individuals who graduated in 2004.

The estimates were performed with the use of Probit models *à la* Heckman to overcome possible self-selection problems. The aim was to estimate the impact of the quality of institutions in the area of origin and that of destination upon the probability of migrating, controlling both for individual characteristics (gender, age of graduate, faculty, degree grade, family income, parents’ education), and for macroeconomic variables in the province (unemployment rate of 25-34 year-olds and per-capita GDP both in the zone of origin and that of destination). As we shall see below, consistent with other studies, the results show that the basic determinants of migration of human capital in Italy appear to be socio-institutional rather than strictly economic.

Our paper is structured as follows: after this introduction, Section 2 provides a rapid overview of the literature on growth and institutions, introducing possible links between institutional quality and highly-skilled migrants. Section 3 illustrates the method adopted to construct the provincial index of institutional quality. Section 4 presents the detailed specification of the model and discusses the main results of the estimates. Conclusions are drawn in Section 5.

**2. Literature overview**

The decisive impact that institutions may have on economic growth, on the environment, service level-of-quality, and on overall efficiency of an area has been examined by a broad strand of the economics literature which, in recent years, has paid growing attention to the role of political and administrative contexts as well as social, historical and cultural factors in conditioning and steering development processes. Starting at least from the work of Douglass North (1990, p. 3), according to whom “institutions are the rules of the game in a society ”, institutions contribute to forming the set of incentives underlying behaviour and individual choices. As they significantly affect the degree of development of an economy, its capacity for growth, the extent of inequalities, etc., many scholars have focused on the links between institutional quality and economic results.

A strand of the literature (Easterly and Levine, 2003; McGuinness, 2007; Acemoglu and Robinson, 2008; Chanda and Dalgaard, 2008) has specifically focused on the importance of institutional quality as the basic determinant of economic growth and total productivity of factors in the long term. Accordingly, better institutions create the so-called business environment,a legal structure which favours investments and directs them towards activities able to ensure higher and faster economic growth; they encourage firms to use better technology, invest in knowledge creation and transfer (Loayza et al., 2005), produce on a larger scale and operate with a long time horizon, with a positive impact on competitiveness and economic performance (Aron, 2000), thereby ensuring higher levels of efficiency and often a fairer distribution of income (Bowen and De Clercq, 2008).

Regarding more specifically the quality of political and administrative institutions (in terms, for example, of well-defined property rights, respect for regulations, degree of corruption, and barriers to entry on markets) various studies have been concerned with measuring it, both for cross-country (Barro and Lee, 1993; Nugent, 1993; Mauro, 1995; World Bank, 1997; Brunetti, 1997; Knack and Keefer, 1997; Djankov et al., 2002) and inter-regional comparisons (Heliwell and Putnam, 1995; Barro and Sala-i-Martin, 1995; Arrighetti and Serravalli, 1999a; Dall’Aglio, 1999), while other contributions have supplied evidence for significant correlations between such measures and various indicators of economic performance, especially as regards the crucial role of institutional differences as a key factor in explaining the causes of growth and stagnation as well as disparities in productivity and accumulation of physical and human capital (Rodrik et al., 2004). Other studies have highlighted the impact of the history of peoples and the connected institutional structures on the economic performance of countries (Hall and Jones, 1999; Acemoglu et al., 2001), focussing for example on the role of institutions in steering entrepreneurialefforts towards more productive activities and supporting business (Baumol, 1990; Murphy et al., 1991).

Some authors have also focused on the role of sub-national institutions, particularly the regional ones, in fostering economic growth. Porter (1997) has argued that economic development is pursued by favouring not isolated companies but industrial clusters, where these latter are meant to involve firms and suppliers, but also include local institutions and educational and research centers. In the same vein, Porter (2003) has shown that the performance of regional economies is strongly influenced by the strength of local clusters. According to Rafiqui (2010), the local outcomes of national systems may differ across space, according to the particular configurations of institutional factors at local levels.

Finally, other authoritative contributions have extended the notion of institutional qualityto social capital endowment (Putnam, 1993a; Narayan and Pritchett, 1997; Woolcock, 1998) and institutional thickness(Amin and Thrift, 1994). Also these concepts refer to a combination of factors which include the presence of virtuous local institutions and inter-institutional links able to create a sharing culture and a set of values which help construct the so-called “social-atmosphere”, generate mutual trust, enhance innovative capacity, expand common knowledge and strengthen local economic activity. Empirical evidence has clarified what role social cohesion (Rodrik, 1997; Ritzen Easterly and Woolcock, 2000) and the spread of collaborative and associative practices (Putnam, 1993a and 1993b; Narayan, 1999) may have as a driver of economic development, showing that growth is favoured by greater social peace and political stability, and by a better quality of institutions and public services.

Moving on to the question which is more relevant to our case, as regards the possibility of institutions being considered also one of the key factors in human capital migration choices, we should point out that in this respect the literature does not yet appear able to provide a definitive answer, partly because there is little substantive evidence – supported as well by little theory – on the role that institutions may have in making a region attractive, especially to highly-skilled workers.

In the standard neoclassical approach *à la* Harris-Todaro (1970), direction and intensity of inter-regional migratory flows are caused first and foremost by labour market variables. Spatial differentials in wages, employment and unemployment rates are the main cause of the phenomenon (Hicks, 1932; Sjaastad, 1962): migrants move from countries and areas with lower wages and employment rates to countries and areas with higher wages and employment rates[[4]](#footnote-5). In the recent experience of increasing interregional migration flows in Europe, a role seems to be played by widespread overeducation and mismatch between the qualification level of the graduates and the available local jobs in the sending regions. This is especially true in countries like Italy, with a production system mostly oriented to traditional manufacturing sectors and therefore a low and stable demand of human capital. The dramatic increase in the supply of human capital occurred in the last decades in a context of sluggish economic growth and innovation rates has acted as a powerful push factor for high skilled workers to migrate towards regions where human capital is expected to be better rewarded (Groot, 1996; McGuinnes, 2006)[[5]](#footnote-6).

In recent years, the literature has seen specific treatment of the determinants of skilled migration. Such determinants appear to depend less on the factors usually considered (wage, employment, etc.) and more linked to individual factors such as risk aversion and propensity, socio-cultural background (Epstein and Gang, 2010), professional specialisation and personal motivation in the search for a better working environment (Jaeger et al., 2010). A recent econometric survey (Gibson and McKenzie, 2011) concerning graduates with a very high degree grade, coming from some Pacific countries, underlines the key role of factors other than the difference in wages or employment in influencing the decision of highly-skilled workers to emigrate, to stay abroad or to return to their country of origin. This choice proves chiefly guided by assessments regarding career prospects, professional advancement and the working environment.

But a crucial role in attracting talent seems to be played also by factors concerning expected life conditions at destination for migrants and their families[[6]](#footnote-7): cultural and social amenities (Niedomysl, 2006; Ciriaci, 2010); good lifestyle (Cebula, 2005; Di Pietro, 2005; van Dalen and Henkens, 2007) or the quality of life (Polgreen and Simpson, 2011; Karemera et al., 2000; Florida, 2002a, 2002b, 2002c); the welfare system (Massey et al., 1993; Carrington et al., 1996; Mushi, 2003) and more generally favourable political and institutional conditions in the destination country (Leblang et al., 2009).

It thus comes as no surprise, and there is extensive evidence thereof, that mobility between two countries with different mean levels of real wages may remain low when a considerable improvement in the standard of living and quality of life in the poorer country is expected (World Bank, 1997). By contrast, corruption, excessive bureaucratisation, poor or inefficient organisation of public services, a lower endowment of infrastructures, lack of security, and an unsatisfactory social and cultural life may constitute a push factor for emigration over and above conditions of income.

Also in the Italian case, most scholars attempting to explain net migration rates of a given province/region have chiefly referred to strictly economic variables such as the rate of provincial unemployment (Mocetti and Porello, 2010), household per-capita income (Etzo, 2007), wage differentials (Napolitano and Bonasia, 2010), the industrial level in the strict sense, the size of the population at working age, the household consumer price index, and housing costs (Cannari et al., 1997; Basile and Causi, 2007). In some cases, the degree of regional corruption has also been considered (Arlacchi, 2007), or labour market functioning and rigidities and mobility costs (Faini et al., 1997). Therefore, in facing the crucial issue of the main motivations underlying the internal migratory choices of internal skilled migrations in Italy, institutional (or context) factors do not yet seem to have received adequate treatment in the literature. Yet, as effectively pointed out by Marinelli (2011) innovation and quality of life are key structural drivers of skilled migration. “Creative young people” often migrate not only to have better chances of employment and higher wages, but also to live in cities where the environment is overall more amenable, living and working conditions are better, and professional and social opportunities more interesting, chiefly thanks to a better quality of local institutions, which define the level and quality of essential services such as health, security, legality, transport and culture (Viesti, 2005),

In the five-year period 2001-2005 in Italy there were very positive regional balances for graduate migration mobility for Emilia Romagna (5.6), Lazio (5.1), Lombardy (4.3) and Tuscany (3.1), almost parity for Veneto (0.0), Liguria (0.1) and Marche (0.6), and decidedly negative balances for all the regions in the South, especially for Calabria (-11.4), Basilicata (-10.2), Puglia (-9.3) and Campania (-7.9) (Mocetti and Porello, 2010). In line with the international trend, some empirical evidence indicates that differentials of available per capita income between regions in the Centre-North and those in the South do not seem to significantly affect the decision of graduates to migrate, unlike what was found for other migrant categories (Piras, 2009). It is therefore necessary to ascertain whether, alongside the traditional factors driving mobility, a role may be played by inter-regional differences in the endowment of institutional factors. In this respect, we know that a relatively poor endowment of institutional factors (infrastructures, human capital, social capital) appears to penalise in general the economic performance of all regions in Italy compared with the rest of Europe, and that in particular the gap is more serious for the country’s southern regions (Basile et al., 2009). In our work, we set out to verify that the institutional gap also plays a role in migrant choices between Italy’s provinces.

Following the literature on migration models, we examine skilled mobility, controlling for some individual characteristics (age, gender, marital status, parent characteristics), the educational curriculum (degree grade, postgraduate qualification, Erasmus, stages, etc.), and provincial differentials in per capita income levels (Kwok and Leland, 1982). At the same time, we take into account the value assumed for each province of origin and destination by a synthetic indicator of institutional quality based on five groups of elementary indexes (in turn referring to corruption, government, regulation, rule of law, social capital). Our aim is to assess the size of the impact of institutions on the choice of Italian graduates to migrate.

**3. Measuring institutional quality**

The aim of this section is to illustrate the method with which we construct the index of institutions used in the subsequent econometric investigation. Our index takes its cue from the World Governance Indicator (WGI) proposed by Kaufmann et al. (2010) in the context of the *Knowledge for Change Programme* promoted by the World Bank. The WGI is a complex indicator conceived to measure the quality of governance in 213 countries in the period 1996-2010; it is structured into six dimensions which concern some major quality characteristics of a national system, called as follows: i) Voice and accountability, ii) Political stability and absence of violence and terrorism, iii) Government effectiveness, iv) Regulatory quality, v) Rule of law, vi) Control and corruption. Kaufmann et al. (2010) define governance as the set of traditions and institutions which ensure the exercise of authority by a government. In this definition they therefore include: processes set up to select the governing class, that is the degree of freedom of press and association (Voice and accountability); the perception regarding the probability of a government being destabilised by forms of violence (civil wars, terrorism) or coups d’état (Political stability); the quality of public service and the policies formulated and implemented by the government (Government effectiveness); the ability of a government to promote and formulate policies aiming at the development of firms and the private sector in general (Regulatory quality); the perception concerning the rule of law in society both in terms of contract fulfilment, property rights, police forces, activities of the magistracy and crime levels (Rule of Law); the degree of corruption found in those who perform public functions both in terms of illegal gains and private proceeds acquired to the detriment of society (Control and corruption). Each of these dimensions is the result of the aggregation of many simple indexes, gathered from official sources and surveys conducted by public, private and non-governmental institutions.

The Institutional Quality Index (IQI), the indicator which we used, follows the scheme proposed by the WGI, in particular the hierarchy framework[[7]](#footnote-8) illustrated in Figure 1, for which each index derives from aggregation of indexes of a lower rank. The main differences between WGI and IQI are that this latter: a)is constructed on the basis of provincial and not national data and b)considers only five of the six dimensions of the WGI, insofar as the dimension “Political stability and absence of violence and terrorism”,which captures phenomena such as the frequency of coups or terrorist attacks and the presence of the military in politics, is not relevant to the situation in Italian provinces.

Insert Figure 1

* 1. **The IQI**

The data needed to evaluate the elementary indexes to build up the IQI were collected from institutional sources, research institutes and professional registers, and refer to the period 1991-2009. Table 1 reports the details of all the elementary indexes used for each dimension: *Voice and accountability* captures the participation in public elections, the phenomenon of associations, the number of social cooperatives and cultural liveliness measured in terms of books published and purchased in bookshops; *Government effectiveness* instead measures the endowment of social and economic structures in Italian provinces and the administrative capacity of provincial and regional governments in relation to policies concerning health, waste management and the environment; *Regulatory quality* comprises information concerning the degree of openness of the economy[[8]](#footnote-9), business environment and hence the ability of local administrators to promote and protect business activity; *Rule of law* summarises data on crime against persons or property, on magistrate productivity, trial times, the degree of tax evasion and the shadow economy; *Corruption* summarises data on a) crimes committed against the Public Administration (PA), b) the number of local administrations overruled[[9]](#footnote-10) by the federal authorities and c) the Golden-Picci Index, measuring the corruption level on the basis of “the difference between the amounts of physically existing public infrastructure (...) and the amounts of money cumulatively allocated by government to create these public works” (Golden and Picci, 2005, p. 37).

The criterion which steered the choice of 24 elementary indexes, albeit in the framework proposed by WGI, took account of the objectives of our analysis and the actual availability of data on a provincial basis. As regards the reference time period, the values of the elementary indexes are calculated in most cases for the years immediately prior to 2004[[10]](#footnote-11), consistent with the fact that the data on professional recruitment refer to individuals graduating in 2004. Only in five cases do the elementary indexes refer to the years after 2004. However, the heterogeneity of the time reference does not, in our opinion, pose major problems, insofar as it is reasonable to assume that the processes of institutional change occur slowly, and that appreciable changes in institutional quality occur only in the medium-long term.

Insert Table 1

**3.2 Methodology**

The method adopted to obtain IQI from elementary indexes was developed in three main phases: normalization, attribution of weights, aggregation of indexes.

*Normalization*

The first step consists in normalizing the elementary indexes, that is, in reformulating each elementary index so that it is measurable in the range . The method we use in this paper is that of the distance from the ideal point. Using  to denote the i-th elementary index for the j-th province, the corresponding normalized index is



with  where  and  are respectively the minimum and maximum value assumed by the i-th index in the various provinces and .

*Weight assignment*

The second phase envisages assignment of a weight for each normalized index. To do this, we use the Analytic Hierarchy Process (henceforth AHP) elaborated by Saaty (1980, 1992) and widely employed in multiple criteria decision-making in different fields such as geographical sciences, land planning and resource allocations[[11]](#footnote-12). The AHP method hinges on a predetermined multi-layer framework creating a hierarchy among elementary and aggregate indexes (see Figure 1). To derive a weight for each index of a given rank, representing the importance of that index in determining the index of the upper level, AHP starts from pairwise comparisons between indexes of the same layer based on verbal judgments on the relative importance of each index[[12]](#footnote-13). These judgments are then turned into numerical values of importance. According to the following Saaty relative numerical scale:

|  |  |
| --- | --- |
| **Definition** | **Importance value** |
| Indifferent | 1 |
| Moderate dominance | 3 |
| Strong dominance | 5 |
| Very strong dominance | 7 |
| Absolute dominance | 9 |
| Intermediate values | 2-4-6-8 |

All the comparisons made between the importance values of the elementary indexes of each dimension are reported in matrix :



By construction, matrix  is a square matrix with all the elements of the diagonal equal to 1:  (for ) and (for . Saaty showed that a weight can be estimated for each elementary index. By calculating the eigenvalues of matrix , considering the eigenvector associated to the maximum eigenvalue, and setting the constraint under which the sum of weights is equal to one, a linear system of *n* equations is generated whose solution supplies the weights of elementary indexes.

Using  and  to denote, respectively, the eigenvalue and the maximum eigenvalue of matrix , if comparisons of importance are fully consistent, then , otherwise . Saaty (1980, 1992) proposed a consistency index  which assumes the value of zero in the event of maximum consistency, and positive values otherwise. According to Saaty the threshold value which defines adequate consistency of determinations is . Application of this procedure to our elementary indexes allows us to obtain weights of the elementary indexes  such that and the weights of dimensions such that  (Table 2).

Insert Table 2

*Aggregation*

Having defined the weights of each index, the aggregation function used to determine the index of institutions is given by:



where IQI is the index of provincial institutions which, by construction, assumes values in the range . Table 3 reports the ranking of Italian provinces classified on the basis of the institutions indicator IQI[[13]](#footnote-14); the same information is supplied by Figure 2 below with a GIS map.

Insert Table 3

Insert Figure 2

*Sensitivity analysis*

Finally, the results of a sensitivity analysis carried out to test the response of the institutions’ index to alternative scenarios are reported in the Appendix. The main issue in the methods of constructing synthetic indexes is known to lie in the subjectivity of the criterion for assigning weights which is affected by the degree of importance assigned to the individual dimension. For this reason we carried out a sensitivity analysis of the IQI with which we tested its performance in eight different scenarios obtained by assigning different weights to different dimensions. The analysis shows that the IQI is, among the various scenarios reproduced, the one that comes closest to intermediate values of variability and one of the best scenario able to minimize the distance from the mean for each of the 107 provinces.

1. **Empirical investigation**
   1. **Data**

The chief source of statistical information which we used was the ISTAT survey on the professional recruitment of graduates in 2004 (ISTAT, 2009)[[14]](#footnote-15). The analysis focuses on individual movements implying change of residence between Italian provinces[[15]](#footnote-16).To supplement this dataset, we used the provincial data for per capita GDP and the unemployment rate for 25-34 year olds (sources: ISTAT: Conti Economici Regionali 1995-2009 and Istituto Tagliacarne: Atlante di competitività delle provincie italiane 2001) as well as information on the elementary indexes used to construct the IQI indicator (the sources are reported in Table 1).

Prior to examining the econometric estimates, let us first focus on the inter-regional net migration balance for graduates, calculated on the basis of the sample in question. Table 4 represents individual movements implying change of residence between Italian regions. Hence, Italian graduates are classified on the basis of comparison between their region of residence in 2004 (i.e. immediately after graduation) and their region of residence in 2007 (i.e. after three years from graduation). As reported in Table 4 both for the regions and the macro areas of Central and Northern Italy, the *Mezzogiorno* and abroad, Emilia Romagna, Lazio and Lombardy show the highest positive net migration balance (31%, 22% and 16% respectively), thereby proving to be the most attractive regions for young graduates. By contrast, Basilicata (-37%), Puglia (-36%) and Calabria (-31%) are the regions with the greatest loss of young graduates for the period 2004-2007. Significantly, Figure 3, which measures migration balances for 2004-2007 against the values of the indicator IQI[[16]](#footnote-17), highlights a marked positive correlation between the two dimensions.

Insert Table 4

As regards the macro areas, ISTAT (2009) reports that about 25% of the graduates transferred their place of residence from the South to a region in Italy’s Centre-North or abroad, while there was a positive balance (+11%) in the Centre-North and very positive (+130%) abroad. Also the data on pre-degree migration (i.e. of high-school leavers) confirm the negative trend in the *Mezzogiorno*: 3,546 students with residency in 2004 in a region in southern Italy graduated at a university in the Centre-North. This means that about 22% of southern Italian high-school leavers who embark on a degree course migrate to a region in the Centre-North to continue their university studies.

Insert Figure 3

* 1. **The model**

As the migration decision is the outcome of a dichotomous choice (whether or not to migrate), the most suitable model for our empirical investigation necessarily belongs to the field of models with binary variables. In particular, in our case, we employ a probit model with the Heckman correction since this is an effective and widely used way to deal with the problem of sample selection, which is definitely relevant in the issue we face. As a matter of fact, a graduate’s decision to migrate is greatly influenced by the employment situation and/or by the existence of a job opportunity in the destination region. Especially in the case of highly skilled professionals, the migration choice is often made only in the moment in which there is a concrete professional opportunity. This circumstance creates quite a few problems for the researcher because it makes the self-selection bias in the sample particularly serious. Thus, estimating a probit model in this form:



where  is the dependent variable of the model, which assumes the value of 1 in the event of migration and 0 otherwise, for every *k*-th student of the *j*-th province, and  is the set of covariates, would yield coefficients estimated for the population of students who work and have decided to migrate (or otherwise). This population clearly differs from the more general of all graduates, whence estimates would be biased.

Thus it seemed necessary to resort to the correction introduced by a two-step probit model *à la* Heckman*,* which estimates two equations simultaneously, one for the employment situation and the other for migration choice. Heckman (1979) showed that, on respecting a series of conditions[[17]](#footnote-18), the estimation made produced by a model structured as above do not produce biased coefficients. The model proposed is thus a bivariate probit in the following form:



where  is the dichotomous variable of the outcome equation which assumes the value of 1 if the graduate is employed and 0 otherwise;  is the set of covariates of the employment equation; is the dichotomous variable of the selection equation defined as mentioned above and  is the set of covariates of the equation of the migration choice which comprises, according to the different considered specifications, alternative sets of the following explanatory variables: i) student characteristics: age, gender, marital status, father education and father network; ii) information on the university career: degree grade, degree type, postgraduate course, work experience (stage), erasmus project and antelauream migration decision; iii) context variables: salary, per-capita GDP and unemployment rate both for the area of origin and that of destination; iv) IQI and single IQI dimensions both for the area of origin and for that of destination. is the inverse Mills ratio , obtained by first-stage regression, which allows the self-selection problem to be taken into account. Table 5 lists all the variables used in the model.

Insert Table 5

Another question concerns the possible problem of endogeneity linked to the direction of the causality nexus between the migration choice and the level of institutions. In this sense, there would appear to be no well-founded possibility of an inverse causality between institutional quality and the migration decision. Since the latter does not seem to be able to give rise to effects (especially short term) on institutions, we can rule out any consequent endogeneity problem of the explanatory variable “institutions”.

* 1. **Results**

The decision of a young graduate to move from his/her province of residence is the outcome of a complex choice behind which there may be many motivations. It is the fruit of a set of factors ranging from personal and family characteristics, academic curriculum, the economic and institutional context of the graduate’s province of residence and destination. This scheme, already illustrated in the previous pages, led us to consider in our model three reference macro-contexts: i) individual characteristics, ii) education and iii) context characteristics. Table 6 illustrates the results of the five specifications implemented (which we shall call “models” for simplicity’s sake). For each model we report the results of only second-stage equations[[18]](#footnote-19) (the so-called *selection equation*) with relative *marginal effects* that are useful for more immediate interpretation of estimated coefficients. The Wald test is also reported at the bottom of the table to verify the correlation of errors, as specified in Heckman’s hypothesis. As may be observed, the null hypothesis is rejected with a significance of 5% in model 1 and with lower significance in other cases. It may thus be concluded that the errors are significantly correlated among themselves, as required by the Heckman hypothesis. All the proposed models present very significant estimates for the coefficients of the variables of the first-level equation of employment (not reported). Except for the *age* variable, all the other regressors are always (except in one case) very important in explaining the probability of finding employment.

Moving on to estimates directly connected with the tendency to migrate, in model 1 the selection equation includes several individual characteristics of the student and information on his/her university career. The estimates show first and foremost that a higher age reduces the migration probability by 4%. This finding, in contrast with that of Bacci et al. (2008) and Ciriaci (2010), is not in our opinion unfounded for two fundamental reasons. First, since a graduate of above-average age could be in a weaker position on the domestic job market, which is why he/she tends to develop relations (even during his/her studies) in the area of origin which enhance the probability of finding employment locally. Secondly, since above-average age graduates are more likely to have chosen already during their studies to work, which increases the possibilities of professional recruitment after graduating in the area of origin. This last hypothesis seems to be borne out by the fact that as many as 65% of graduates in the sample stated that, during their studies they either did a steady job (20%) or occasional or seasonal work (45%). In practice, the student who already work will have, other things being equal, little incentive to look for a new job outside the context of origin.

The coefficient of the *gender* variable (1=female) indicates that women have a 2.4% higher migration probability than their male counterparts, a result consistent with that obtained by Faggian et al. (2007). The *marital\_status* variable (1=married, cohabiting, divorced) suggests instead that undertaking some form of family commitment increases the migration probability by 5.6%. This result may be interpreted in the following way: the greater push to migrate stems from the more urgent need to establish a steady source of income for the household.

Also the set of variables concerning the university career presents estimates which are significant and have the expected signs. In line with previous studies (Jahnke, 2001; Ciriaci, 2010, Nifo et al., 2011), graduating with a high mark and attending a specialist degree course increase the migration probability respectively by 0.1% and 5.2%. The same positive effect is found for postgraduate experience (Masters, PhD and specialisation) with a positive impact of 5.3%.

As regards the family component, we believe that belonging to a family context with a high educational level or with an above-average social level may constitute a push factor for the migration choice. To capture such phenomena, we chose to use two *proxies*: the educational level of the graduate’s father and the father’s membership of social and professional networks of greater importance or prestige. The *father\_edu* variable (1= graduate father) seeks to capture to what extent the father’s degree affects the migration choice. In line with our expectations, the probability of migrating increases by about 5% when *father\_edu*=1. The *father\_netw* variable (1= entrepreneur or public manager) aims to estimate network effects that may be generated in a family context with an above-average professional position. Estimation of the coefficient of this variable confirms our hypothesis, showing an increase, albeit of only 1%, in migration probability. Finally, both in this first model and in the subsequent ones, the coefficient of the *stage* variable does not prove significant.

In model 2 we added two variables: the first concerns the possibility of having carried out a period of training abroad with the Erasmus project and the second the phenomenon of pre-graduation migration. The result of the Erasmus project is of interest. The students who took part in the Erasmus project during their university education have a migration probability which is over 10% higher than their colleagues who have not had such an experience[[19]](#footnote-20). The *ante\_lauream* variable is a dummy which assumes a value of 1 for student who were resident in 2004 in a southern Italian region and graduated from a university in the Centre-North, and a value of 0 for all other cases. It is constructed to quantify the impact of the South-North migration pre-graduation on the migration choice post-graduation. According to our estimates, moving for study purposes from a southern Italian region to one in the Centre-North increases by almost 47% the probability of migrating at the end of their education. This impact, which was very high in this first phase of analysis, diminished in subsequent models, albeit remaining relatively high (a probability increase of around 15%). This result is consistent with findings elsewhere (Faggian et al., 2007; Bacci et al., 2008; Ciriaci, 2010).

In model 3 we inserted the set of economic variables. The *salary* variable is the monthly net salary received by the graduate employed. As in expectations, the coefficient has a positive sign: the propensity to move increases with the remuneration obtained. However, despite having the expected sign and being very significant, there is little impact (<0.1%) of this variable on the probability of migrating. The four other variables are: real per-capita GDP and the unemployment rate in the 25-34 age class both for the province of origin (*rgdp\_pro\_o* and *unempl\_rate\_o*) and for the destination province (*rgdp\_pro\_d* and *unempl\_rate\_d*). All the economic variables have the expected sign and are very significant. As expected,as GDP in the province of origin (destination) increases, the migration probability decreases (increases); by the same token, as unemployment in the province of origin (destination) increases (decreases), the migration probability increases.

As regards in particular the province of origin (*rgdp\_pro\_o*), the coefficient of *marginal effects* tells us that, against an increase in per-capita GDP of 1,000 euros, the migration probability decreases by about 17%, while a 10% increase in the unemployment rate (*unempl\_rate\_o*) leads to a 27% rise in migration probability.

Once assessed the importance of strictly economic variables in graduate migration choice, it seems particularly important to examine the possible impact of more general conditions, such as those connected with the institutional context. To this end, model 4 considers the previously constructed institutional index both as regards the province of origin (*IQI\_o*) and that concerning the province of destination (*IQI\_d*). As expected, the coefficient of the province of origin has a negative sign, confirming the hypothesis that the level of institutions in the area of origin negatively affects the graduate’s migration choice. In particular, the *IQI\_o* variable has a very high marginal effect (about 69%), which confirms that a good institutional quality in the area of origin appreciably reduces the probability of an individual migrating[[20]](#footnote-21).

So as to achieve a better interpretation of this model’s output and evaluate the relative impact of institutions and strictly economic variables, one can appropriately compare the impact on migration probability wielded by a unit rise in IQI with the effect of a correspondent change in per-capita GDP. Since a unit rise in IQI implies a change from the last to the first place in the provinces ranking (in terms of Table 3, moving from the institutional quality of Vibo Valentia to the one of Florence), the correspondent change in per-capita GDP amounts to the difference between the richest and the poorest province i.e. 22,000 euros (the gap between Milano and Agrigento).

Following an increase of 22,000 euros in the per-capita GDP in the province of origin, the migration probability diminishes by about 68%, indicating an impact which is very close to that of the institutional variable.

Finally, model 5 replicates the content of the above regression, yet no longer considering the institution index as a whole, but the individual dimensions which contributed to its formation, again with reference to the province of origin and that of destination. In particular, the *government\_o* variable, which represents the administrative capacity of local governments contributes considerably to holding back the young graduate (about 60%). The estimate of the *rule\_o* variable (concerning the rule of law) confirms that a province with a more efficient legal system and a lower propensity to the occurrence of crime or tax evasion tends to retain its graduates: the migration probability decreases by about 20% as the rule of law indicator rises. Likewise, the *marginal effect* of the *voice\_o* variable concerning social capital indicates that a civil society which is richer in social capital reduces the migration probability of young graduates by almost 30%. Conversely, in this specification, the variables *corruption\_o* and *regulatory\_o*, do not have the expected signs. Finally, it is worth pointing out that in this fifth model the unemployment variable regains significance.

1. **Conclusions**

The current Italian internal migration is characterized on the one hand by the fact that almost all transfers are one-way from South to Centre-North and, on the other hand, for the broad participation of skilled workers, graduates in particular. These peculiarities obviously increase the interest in the phenomenon as they strengthen the potential capacity of migration to give rise to significant negative consequences for the southern regions, in terms of loss of skills and competencies of the resident workforce and reduction of average human capital, thus urging appropriate policy measures.

There is no longer doubt that the decision whether or not to migrate is significantly affected by the desire to live in geographical areas that ensure better job opportunities, but scholars have also highlighted that, as soon as talent is concerned, the story is more complex because skilled individuals basically move in search for higher “quality of life”, meant as the overall product of a mix of economic, social and cultural factors related to economic welfare, job opportunities, social mobility but also with the efficiency of institutions, greater availability and quality of services and infrastructures, effectiveness of the judiciary and public administration, better protection of property rights, public order, widespread civic sense, etc.

This paper contributes to this stream of literature by focusing on the role of institutional quality as one of the main determinants of internal migration decisions of Italian graduates censused in the “Survey on the professional recruitment of graduates” in Italy conducted by the National Statistics Office (ISTAT) in 2007 on a sample of 47,300 individuals who graduated in 2004. The investigation is carried out in two steps. First we elaborate an index of institutional quality (IQI) measuring the endowment of institutional quality for each Italian province. Second, by using a Probit models à la Heckman, we estimate the impact of the institutional quality in the area of origin and that of destination upon the probability of migrating.

The empirical investigation reported in this paper allowed us to obtain at least two major results. The first is that the acute importance of the North-South gap in respect of a broad range of socio-economic conditions is confirmed as regards institutional quality as well: all the provinces in the *Mezzogiorno* are characterised by lower levels of institutional quality than in the rest of Italy. The second result is that we ascertained the key role of *institutional quality* and especially the rule of law, the effectiveness of regional policies and of social capital, as factors of great importance in intellectual mobility choices. On combining these two results with the predictions of that strand of the literature that chiefly attributes the role of attraction factors for skilled work to non-economic drivers, it comes as no surprise that the chief characteristic of the *new emigration* is the almost one-way direction of flows from the South to the North of Italy, searching for an area in which it is pleasing to live and work, with a high level of essential public services, less income inequality and less crime, an interesting supply of culture, a healthy social environment, and a good overall quality of life, dynamic labour markets, where they encounter higher wage.

The policy implications for retaining and attracting skilled workers are straightforward: local development strategies must be complemented by measures aimed at making the work environment more attractive for talented, by recognizing the merit and allowing for adequate rewards for the best and the productive context more innovative and dynamic, so as to ensure level of income, security of job and prospects for professional advancement. Policy interventions have to be designed also to improve quality of life and personal and family’s safety, by making available local amenities, good school and facilities for children, and fostering an attractive cultural milieu. In other words, to attract and retain talent, a region needs institutions which simply “do their job”, taking care of making the area an enjoyable place for working and living.

**Table 1** Structure of elementary indexes

|  |  |  |  |
| --- | --- | --- | --- |
| **Index** | **Value** | **Source (details in notes)** | **Year** |
|  |  |  |  |
| **Voice and accountability** |  |  |  |
| Social cooperatives | Absolute Value1 | ISTAT | 2001 |
| Associations | Absolute Value1 | ISTAT | 2004 |
| Election participation | Turnout %2 | Interior Ministry | 2001 |
| Books published | Absolute Value3 | ISTAT | 2007 |
| Purchased in bookshops | Index4 | Sole24Ore | 2004 |
|  |  |  |  |
| **Government effectiveness** |  |  |  |
| Endowment of social facilities | Index5 | Tagliacarne | 2001 |
| Endowment of econ. facilities | Index6 | Tagliacarne | 2001 |
| Regional health deficit | Absolute Value7 | MEF and MH | 1997-2004 |
| Separate waste collection | Separate/total8 | Tagliacarne | 2007 |
| Urban environment index | Index9 | Legambiente | 2004 |
|  |  |  |  |
| **Regulatory quality** |  |  |  |
| Economy openness | Index10 | Tagliacarne | 2001 |
| Local government employees | Absolute Value11 | ISTAT | 2003 |
| Business density | Index12 | Tagliacarne | 2008 |
| Business start-ups/mortality | Registration/cessation13 | Tagliacarne | 2003-2004 |
| Business environment | Index14 | Confartigianato | 2009 |
|  |  |  |  |
| **Rule of law** |  |  |  |
| Crimes against property | Absolute Value15 | ISTAT | 2003 |
| Crimes reported | Absolute Value16 | ISTAT | 2003 |
| Trial times | Trial lengths I, II, III17 | Crenos | 1999 |
| Magistrate productivity | Magistrate Trials18 | Ministry of Justice | 2004-2008 |
| Submerged economy  Tax evasion | Index19  Index20 | ISTAT  Revenue Agency | 2003  1998-2002 |
|  |  |  |  |
| **Corruption** |  |  |  |
| Crimes against PA | Index21 | Interior Ministry & ISTAT | 2004 |
| Golden-Picci Index | Index22 | Golden and Picci (2005) | 1997 |
| Special Commissioners | Municipalities overruled23 | Interior Ministry | 1991-2005 |
|  |  |  |  |
|  |  |  |  |

Notes: 1 Social cooperatives per 100,000 residents, provincial level. ISTAT: “Le cooperative sociali in Italia” (2006) and “Le organizzazioni di volontariato in Italia” (2005); 2 2001 general election, provincial level. Interior Ministry: “Archivio storico delle elezioni” <http://elezionistorico.interno.it/> ; 3 Books published, in absolute value, provincial level. ISTAT: “La produzione libraia” (2007); 4 Purchased books over resident population, provincial level. Il Sole24Ore “Dossier sulla qualità della vita” (2004); 5 Includes education, healthcare and leisure facilities, provincial level. Tagliacarne Institute “Atlante di competitività delle province italiane” (2001); 6 Includes the following networks: roads, railroads, ports, airports, energy, ICT, banking, provincial level. Tagliacarne Institute “Atlante di competitività delle provincie italiane” (2001); 7 Regional health deficit per capita 1997-2004, regional level. Elaboration on Ministry of Economy and Finance and Ministry of Health data from “Relazione generale sulla situazione economica del Paese” (1997-2004); 8 Share of separate waste collection on total waste collection, provincial level. Tagliacarne Institute “Atlante di competitività delle province italiane” (2001); 9 Includes 25 indexes relative to: air quality, water quality, purification plants, waste management, public transportation, energy consumption, Public parks, Eco management, provincial level. Legambiente “Ecosistema Urbano 2004” (2004); 10 Import + Export on the gross domestic product, provincial level. Tagliacarne Institute “Atlante di competitività delle provincie italiane” (2001); 11 Public servants over resident population, regional level. ISTAT: “Indicatori statistici sulle amministrazioni centrali e locali” (2003) <http://dati.statistiche-pa.it/> ; 12 Number of firms for 100 residents, provincial level. Tagliacarne Institute “Atlante di competitività delle province italiane” (2008); 13 Firms registration/mortality, provincial level. Tagliacarne Institute “Atlante di competitività delle province italiane” (2003-2004); 14 Includes 39 indexes relative to: entrepreneurship, job Market, tax system, market competition, banking, bureaucracy; public services to firms, firms’ cooperation, provincial level. Confartigianato: “L’indice Confartigianato – Qualità della vita dell’impresa” (2009); 15 Number of crimes against property over resident population, provincial level. ISTAT: “Indicatori territoriali per le politiche di sviluppo” (2003); 16 Number of crimes reported over resident population, provincial level. ISTAT: “Indicatori territoriali per le politiche di sviluppo” (2003); 17 Average length of judicial process, regional level. CRENOS “Data-base on crime and deterrence in the Italian regions (1970-1999)”; 18 Number of completed civil and criminal trials for magistrate, regional courts level. Ministry of Justice, statistics: “Graduatoria rispetto agli esauriti per magistrato presente” (2004-2008); 19 ISTAT estimation, provincial level. ISTAT: “Le misure dell’economia sommersa secondo le statistiche ufficiali” (2003); 20 Based on the difference between the estimated added value by national accounts and tax system (IRAP and individual income tax returns), provincial level. Agenzia delle entrate: “Analisi dell’evasione fondata su dati IRAP, Anni 1998-2002” (2006); 21 Number of crimes against the public administration over number of public servants, regional level. ISTAT: “Indicatori territoriali per le politiche di sviluppo” (2004); 22 Difference between the amounts of physically existing public infrastructure and the amounts of money cumulatively allocated by government to create these public works, provincial level. Golden and Picci (2005); 23 Absolute value of the overruled municipalities on total municipalities, regional level. Interior Ministry: “Relazione sull’attività svolta dalla gestione straordinaria dei Comuni commissariati” (1991-2005).

Table 2 Indexes and weights

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Index** |  | **Weight** |
|  |  |  |  |
| **D1** | **Voice and accountability** | **K1** | **0.168445** |
| I1 | Social cooperatives | h11 | 0.19456 |
| I2 | Associations | h12 | 0.20032 |
| I3 | Election participation | h13 | 0.20178 |
| I4 | Books published | h14 | 0.19899 |
| I5 | Purchased in bookshops | h15 | 0.20435 |
|  |  |  |  |
| **D2** | **Government effectiveness** | **K2** | **0.311965** |
| I6 | Endowment of social facilities | h21 | 0.25125 |
| I7 | Endowment of economic facilities | h22 | 0.24898 |
| I8 | Regional health deficit | h23 | 0.20011 |
| I9 | Separate waste collection | h24 | 0.15167 |
| I10 | Urban environment index | h25 | 0.14799 |
|  |  |  |  |
| **D3** | **Regulatory quality** | **K3** | **0.107279** |
| I11 | Economy openness | h31 | 0.25934 |
| I12 | Local government employees | h32 | 0.09836 |
| I13 | Business density | h33 | 0.24996 |
| I14 | Business mortality | h34 | 0.19892 |
| I15 | Business environment | h35 | 0.19342 |
|  |  |  |  |
| **D4** | **Rule of Law** | **K4** | **0.345128** |
| I16 | Crimes against property | h41 | 0.13813 |
| I17 | Crimes reported | h42 | 0.14921 |
| I18 | Trial times | h43 | 0.15151 |
| I19 | Magistrate productivity | h44 | 0.14337 |
| I20 | Submerged economy | h45 | 0.25784 |
| I21 | Tax evasion |  | 0.15994 |
|  |  |  |  |
| **D5** | **Corruption** | **K5** | **0.0671837** |
| I22 | Crimes against PA | h51 | 0.41324 |
| I23 | Golden-Picci Index | h52 | 0.50823 |
| I24 | Special commissioners | h53 | 0.07853 |
|  |  |  |  |
|  | Consistency index |  | **0.07** |

Table 3 Ranking of provinces by Institutional Quality Index (IQI)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Rankk** | **Region** | **Province** | **IQI** |  | **Rank** | **Region** | **Province** | **IQI** |
| 1 | Tuscany | FIRENZE | 1 | 55 | Abruzzo | TERAMO | 0.630233 |
| 2 | Tuscany | PISA | 0.923938 | 56 | Abruzzo | CHIETI | 0.626192 |
| 3 | Friuli V. G. | TRIESTE | 0.92088 | 57 | Marche | MACERATA | 0.618667 |
| 4 | Lombardy | MILANO | 0.904026 | 58 | Friuli V. G. | UDINE | 0.613164 |
| 5 | Tuscany | LIVORNO | 0.900214 | 59 | Liguria | LA SPEZIA | 0.612223 |
| 6 | Tuscany | LUCCA | 0.870909 | 60 | Veneto | ROVIGO | 0.605897 |
| 7 | Tuscany | SIENA | 0.856771 | 61 | Marche | PESARO URBINO | 0.588908 |
| 8 | Lombardy | VARESE | 0.852985 | 62 | Abruzzo | L'AQUILA | 0.583302 |
| 9 | Tuscany | PRATO | 0.852242 | 63 | Abruzzo | PESCARA | 0.573818 |
| 10 | Emilia R. | RAVENNA | 0.81267 | 64 | Marche | ASCOLI PICENO | 0.562799 |
| 11 | Tuscany | AREZZO | 0.809928 | 65 | Friuli V. G. | PORDENONE | 0.562613 |
| 12 | Lombardy | BERGAMO | 0.80816 | 66 | Veneto | BELLUNO | 0.54911 |
| 13 | Emilia R.Romagna | BOLOGNA | 0.804724 | 67 | Lazio | LATINA | 0.538421 |
| 14 | Emilia R. | RIMINI | 0.792543 | 68 | Puglia | BARI | 0.515382 |
| 15 | Lombardia | CREMONA | 0.792431 | 69 | Liguria | IMPERIA | 0.502764 |
| 16 | Lombardia | LECCO | 0.786799 | 70 | Sardinia | CAGLIARI | 0.473925 |
| 17 | Tuscany | MAS-CARRARA | 0.785612 | 71 | Lazio | VITERBO | 0.458523 |
| 18 | Tuscany | PISTOIA | 0.783089 | 72 | Lazio | FROSINONE | 0.427666 |
| 19 | Lombardy | BRESCIA | 0.778222 | 73 | Lazio | RIETI | 0.424876 |
| 20 | Lombardy | MANTOVA | 0.776182 | 74 | Basilicata | POTENZA | 0.424044 |
| 21 | Emilia R. | REGG NELL'EMILIA | 0.774508 | 75 | Puglia | LECCE | 0.415562 |
| 22 | Piedmont | CUNEO | 0.770555 | 76 | Sardinia | ORISTANO | 0.402145 |
| 23 | Emilia R. | PARMA | 0.769726 | 77 | Basilicata | MATERA | 0.398613 |
| 24 | Tuscany | GROSSETO | 0.761918 | 78 | Puglia | FOGGIA | 0.397975 |
| 25 | Veneto | PADOVA | 0.760046 | 79 | Puglia | BRINDISI | 0.385195 |
| 26 | Emilia R. | FORLÌ-CESENA | 0.758702 | 80 | Puglia | TARANTO | 0.383601 |
| 27 | Piedmont | NOVARA | 0.757915 | 81 | Sardinia | SASSARI | 0.379852 |
| 28 | Piedmont | TORINO | 0.738653 | 82 | Sardinia | OLBIA-TEMPIO | 0.359253 |
| 29 | Lombardy | COMO | 0.734622 | 83 | Campania | SALERNO | 0.35662 |
| 30 | Lombardy | PAVIA | 0.733123 | 84 | Campania | AVELLINO | 0.326906 |
| 31 | Lazio | ROMA | 0.725777 | 85 | Sardinia | MEDIO CAMPID. | 0.317572 |
| 32 | Veneto | TREVISO | 0.723866 | 86 | Molise | CAMPOBASSO | 0.311904 |
| 33 | Valle d'Aosta | VALLE D'AOSTA | 0.70977 | 87 | Campania | CASERTA | 0.295097 |
| 34 | Emilia R. | FERRARA | 0.706783 | 88 | Campania | BENEVENTO | 0.294693 |
| 35 | Friuli V. G. | GORIZIA | 0.706458 | 89 | Campania | NAPOLI | 0.283106 |
| 36 | Emilia R. | MODENA | 0.705688 | 90 | Sardinia | NUORO | 0.276577 |
| 37 | Trentino A.A. | TRENTO | 0.701034 | 91 | Sicily | MESSINA | 0.26357 |
| 38 | Piedmont | BIELLA | 0.697289 | 92 | Sicily | SIRACUSA | 0.262956 |
| 39 | Umbria | PERUGIA | 0.697149 | 93 | Sicily | RAGUSA | 0.25345 |
| 40 | Veneto | VICENZA | 0.692686 | 94 | Sardinia | CARB-IGLES | 0.250146 |
| 41 | Liguria | SAVONA | 0.691533 | 95 | Sicily | CATANIA | 0.249958 |
| 42 | Veneto | VENEZIA | 0.689212 | 96 | Molise | ISERNIA | 0.239874 |
| 43 | Liguria | GENOVA | 0.686239 | 97 | Sicily | TRAPANI | 0.22807 |
| 44 | Lombardy | SONDRIO | 0.686148 | 98 | Sicily | PALERMO | 0.226086 |
| 45 | Veneto | VERONA | 0.684185 | 99 | Sicily | CALTANISSETTA | 0.183146 |
| 46 | Piedmont | VERB-CUS-OSS | 0.683976 | 100 | Calabria | REG DI CALABRIA | 0.159626 |
| 47 | Emilia R. | PIACENZA | 0.669015 | 101 | Calabria | CATANZARO | 0.15634 |
| 48 | Marche | ANCONA | 0.663692 | 102 | Calabria | COSENZA | 0.154765 |
| 49 | Piedmont | ASTI | 0.661686 | 103 | Sardinia | OGLIASTRA | 0.153147 |
| 50 | Lombardy | LODI | 0.660543 | 104 | Sicily | ENNA | 0.109935 |
| 51 | Piedmont | ALESSANDRIA | 0.659778 | 105 | Sicily | AGRIGENTO | 0.07716 |
| 52 | Umbria | TERNI | 0.645145 | 106 | Calabria | CROTONE | 0.028472 |
| 53 | Piedmont | VERCELLI | 0.634788 | 107 | Calabria | VIBO VALENTIA | 0 |
| 54 | Trentino A.A. | BOLZANO | 0.632411 |  |  |  |  |

Table 4 Net migration balances of graduates by region 2004-2007

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Region** | **Residents 2004** | **Residents 2007** | **Balance** | **Variation %** |
| Piedmont | 3103 | 3123 | 20 | 1% |
| Valle D’Aosta | 75 | 72 | -3 | -4% |
| Lombardy | 7634 | 8860 | 1226 | 16% |
| Trentino A.A. | 704 | 705 | 1 | 0% |
| Veneto | 4176 | 4209 | 33 | 1% |
| Friuli V.G. | 1080 | 1094 | 14 | 1% |
| Liguria | 1317 | 1282 | -35 | -3% |
| Emilia Romagna | 3034 | 3982 | 948 | 31% |
| Tuscany | 3063 | 3433 | 370 | 12% |
| Umbria | 691 | 732 | 41 | 6% |
| Marche | 1417 | 1329 | -88 | -6% |
| Lazio | 4348 | 5297 | 949 | 22% |
| **Centre-North** | **30642** | **34118** | **3476** | **11.34%** |
| Abruzzo | 1495 | 1324 | -171 | -11% |
| Molise | 417 | 312 | -105 | -25% |
| Campania | 4232 | 3293 | -939 | -22% |
| Puglia | 3179 | 2041 | -1138 | -36% |
| Basilicata | 597 | 375 | -222 | -37% |
| Calabria | 1944 | 1335 | -609 | -31% |
| Sicily | 3013 | 2371 | -642 | -21% |
| Sardinia | 1339 | 1112 | -227 | -17% |
| **South** | **16216** | **12163** | **-4053** | **-24.99%** |
| **Abroad** | **442** | **1019** | **577** | **131%** |
| **Total** | **47300** | **47300** | **-** | **-** |

**Source**: Survey on graduates in 2004 (ISTAT, 2009).

**Table 5** Model variables

|  |  |  |
| --- | --- | --- |
| **Variable** | **Description** | **Source** |
| emigrates  works | Dichotomous, 1= changes residency 2004-2007 and 0= No  Dichotomous, 1= works and 0= does not work | ISTAT, 2009  ISTAT, 2009 |
| **Individual characteristics** |  | ISTAT, 2009 |
| Age | Age of the graduate | ISTAT, 2009 |
| Gender | Dichotomous, 1=F and 0=M | ISTAT, 2009 |
| marital\_status | Dichotomous, 1= married and 0= single | ISTAT, 2009 |
| father\_edu  father\_netw | Dichotomous, 1= graduate degree and 0=other  Dichotomous, 1= entrepreneur and manager and 0= other | ISTAT, 2009  ISTAT, 2009 |
| **Education** |  |  |
| degree\_grade | Degree grade of graduate | ISTAT, 2009 |
| Degree\_type\_ | Dichotomous, 1= five-year, VO and 0=three-year | ISTAT, 2009 |
| post\_lauream | Dichotomous, 1= Master, PhD, five-year and 0= No | ISTAT, 2009 |
| erasmus  stage | Dichotomous, 1=Erasmus and 0= No  Dichotomous, 1= stage and 0= No | ISTAT, 2009  ISTAT, 2009 |
| ante\_lauream | Dichotomous, 1= residency 2004 south/north university and 0= No | ISTAT, 2009 |
| **Context variables** |  |  |
| rgdp\_pro\_o | Province of origin per capita GDP | Tagliacarne, 2004 |
| rgdp\_pro\_d | Province of destination per capita GDP | Tagliacarne, 2004 |
| unempl\_rate\_o | Unemployment rate. 25-34 years province of origin | Tagliacarne, 2004 |
| unempl\_rate\_d | Unemployment rate. 25-34 years province of destination | Tagliacarne, 2004 |
| salary | Salary level of the graduate | ISTAT, 2009 |
| **Institutions** |  |  |
| IQI\_o | Institutions index, province of origin | Our elaboration |
| IQI\_d | Institutions index, province of destination | Our elaboration |
| voice\_o | Civil society index, province of origin | Our elaboration |
| voice\_d | Civil society index, province of destination | Our elaboration |
| government\_o | Policy effectiveness index, province of origin | Our elaboration |
| government\_d | Policy effectiveness index, destination province | Our elaboration |
| regulatory\_o | Regulatory quality index, province of origin | Our elaboration |
| regulatory\_d | Regulatory quality index, province of destination | Our elaboration |
| rule\_o | Rule of law index, province of origin | Our elaboration |
| rule\_d | Rule of law index, province of destination | Our elaboration |
| corruption\_o | Corruption index, province of origin | Our elaboration |
| corruption\_d | Corruption index, province of destination | Our elaboration |
|  |  |  |
|  |  |  |

Table 6 Results from selection equations of Probit models *à la* Heckman

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Model 1** | | **Model 2** | | **Model 3** | | | | **Model 4** | | **Model 5** | |
|  | *Coefficients* | *Marginal effects* | *Coefficients* | *Marginal effects* | *Coefficienti* | *Marginal effects* | | | *Coefficients* | *Marginal effects* | *Coefficients* | *Marginal effects* |
| **MIGRATION** |  |  |  |  |  |  | | |  |  |  |  |
| **Individual characteristics** |  |  |  |  |  |  | | |  |  |  |  |
| age | -.143\*\*\* [.009] | -.041\*\*\* [.002] | -.124\*\*\* [.011] | -.034\*\*\* [.002] | -.038\*\*\* [.012] | -.009\*\*\* [.003] | | -.038\*\*\* [.012] | | -.009\*\*\* [.003] | -.039\*\*\* [.012] | -.009\*\*\* [.003] |
| gender | .085\*\*\* [.013] | .024\*\*\* [.003] | .078\*\*\* [.013] | .021\*\*\* [.003] | .035\*\* [.016] | .009\*\* [.004] | | .039\*\* [.016] | | .011\*\* [.004] | .040\*\* [.016] | .010\*\* [.004] |
| marital\_status | .192\*\*\* [.016] | .056\*\*\* [.004] | .205\*\*\* [.016] | .059\*\*\* [.004] | .233\*\*\* [.019] | .062\*\*\* [.005] | | .235\*\*\* [.020] | | .063\*\*\* [.005] | .243\*\*\* [.020] | .065\*\*\* [.005] |
| father\_edu | .166\*\*\* [.018] | .049\*\*\* [.005] | .125\*\*\* [.018] | .036\*\*\* [.005] | .113\*\*\* [.022] | .029\*\*\* [.006] | | .113\*\*\* [.022] | | .030\*\*\* [.006] | .108\*\*\* [.023] | .028\*\*\* [.006] |
| father\_netw | .031\*\* [.015] | .009\*\* [.004] | .030\* [.016] | .008\* [.004] | .041\*\* [.019] | .011\*\* [.005] | | .034\* [.019] | | .008\* [.005] | .030 [.019] | .007 [.005] |
|  |  |  |  |  |  |  | |  | |  |  |  |
| **Education** |  |  |  |  |  |  | |  | |  |  |  |
| degree\_grade | .004\*\*\* [.001] | .001\*\*\* [.000] | .010\*\*\* [.001] | .002\*\*\* [.000] | .007\*\*\* [.001] | .001\*\*\* [.000] | | .006\*\*\* [.001] | | .001\*\*\* [.000] | .006\*\*\* [.001] | .001\*\*\* [.000] |
| post\_lauream | .179\*\*\* [.016] | .053\*\*\* [.005] | .144\*\*\* [.017] | .041\*\*\* [.005] | .009 [.021] | .002 [.005] | | .016 [.021] | | .004 [.005] | .014 [.021] | .003 [.005] |
| degree\_type | .184\*\*\* [.014] | .052\*\*\* [.003] | .184\*\*\* [.014] | .050\*\*\* [.003] | .141\*\*\* [.017] | .035\*\*\* [.004] | | .136\*\*\* [.017] | | .034\*\*\* [.004] | .135\*\*\* [.017] | .034\*\*\* [.004] |
| stage | -.042 [.027] | -.012 [.007] | -.039 [.029] | -.010 [.007] | -.024 [.033] | -.006 [.007] | | -.022 [.034] | | -.005\*\*\* [.008] | -.037 [.034] | -.009 [.008] |
| erasmus | - | - | .344\*\*\* [.024] | .107\*\*\* [.008] | .188\*\*\* [.029] | .051\*\*\* [.008] | | .193\*\*\* [.029] | | .053\*\*\* [.008] | .197\*\*\* [.030] | .054\*\*\* [.008] |
| ante\_lauream | - | - | 1.30\*\*\* [.023] | .467\*\*\* [.008] | .484\*\*\* [.031] | .146\*\*\* [.011] | | .484\*\*\* [.032] | | .147\*\*\* [.011] | .477\*\*\* [.032] | .143\*\*\* [.011] |
|  |  |  |  |  |  |  | |  | |  |  |  |
| **Context characteristics** |  |  |  |  |  | |  | |  |  |  |  |
| salary | - | - | - | - | .000\*\* [.000] | .000\*\*[.000] | | | .000\*\*\* [.000] | .000\*\*\* [.000] | .000\*\*\* [.000] | .000\*\*\*[.000] |
| unempl\_rate\_o | - | - | - | - | .027\*\*\* [.004] | .007\*\*\*[.001] | | | .000 [.005] | .000 [.001] | .020\*\*\* [.006] | .005\*\*\*[.001] |
| unempl\_rate\_d | - | - | - | - | -.044\*\*\* [.005] | -.011\*\*\*[.001] | | | -.013\*\* [.005] | -.003\*\*[.001] | -.032\*\*\* [.007] | -.008\*\*\*[.001] |
| rgdp\_pro\_o | - | - | - | - | -.000\*\*\* [.000] | -.000\*\*\*[.000] | | | -.000\*\*\* [.000] | -.000\*\*\* [.000] | -.000\*\*\* [.000] | -.000\*\*\*[.000] |
| rgdp\_pro\_d | - | - | - | - | .000\*\*\* [.000] | .000\*\*\*[.000] | | | -.000\*\*\* [.000] | .000\*\*\* [.000] | .000\*\*\* [.000] | .000\*\*\*[.000] |
|  |  |  |  |  |  |  | | |  |  |  |  |
| **Institutions** |  |  |  |  |  |  | | |  |  |  |  |
| IQI\_o | - | - | - | - | - | - | | | -2.691\*\*\* [.235] | -.689\*\*\* [.061] | - | - |
| IQI\_d | - | - | - | - | - | - | | | 2.798\*\*\* [.245] | .716\*\*\* [.063] | - | - |
| corruption\_o | - | - | - | - | - | - | | | - | - | -.457\*\*\* [.164] | -.116\*\*\*[.041] |
| corruption\_d | - | - | - | - | - | - | | | - | - | .772\*\*\* [.183] | .196\*\*\*[.046] |
| government\_o | - | - | - | - | - | - | | | - | - | -2.320\*\*\* [.220] | -.591\*\*\*[.055] |
| government\_d | - | - | - | - | - | - | | | - | - | 2.518\*\*\* [.213] | .640\*\*\*[.054] |
| regulatory\_o | - | - | - | - | - | - | | | - | - | .723\*\*\* [.150] | .184\*\*\*[.038] |
| regulatory\_d | - | - | - | - | - | - | | | - | - | -.759\*\*\* [.143] | -.193\*\*\*[.036] |
| rule\_o | - | - | - | - | - | - | | | - | - | -.825\*\*\* [.177] | -.210\*\*\*[.045] |
| rule\_d | - | - | - | - | - | - | | | - | - | .608\*\*\* [.188] | .154\*\*\*[.047] |
| voice\_o | - | - | - | - | - | - | | | - | - | -1.138\*\*\* [.182] | -.289\*\*\*[.046] |
| voice\_d | - | - | - | - | - | - | | | - | - | 1.489\*\*\* [.184] | .378\*\*\*[.046] |
| constant | -1.139\*\*\* [.107] | - | -1.91\*\*\* [.111] | - | -1.63\*\*\* [.144] | - | | | -1.735\*\*\* [.146] | - | -1.665\*\*\* [.164] | - |
| Observations | 47300 | - | 47300 | - | 47300 | - | | | 47300 | - | 47300 |  |
| Wald test (p-value) | 0.0603 | - | 0.0011 | - | 0.0000 | - | | | 0.0004 | - | 0.0021 |  |
| Log likelihood | -29754.15 | - | -27967.17 | - | -19793.97 | - | | | -19573.33 | - | -19371.25 |  |

Note: robust standard error in brackets. \* indicates significance at 10%, \*\* at 5%, \*\*\* at 1%.

Figure 1: Structure of the Institutional Quality Index (IQI)

**Figure 2** Institutional Quality Index in the Italian Provinces

**

|  |
| --- |
| *Provincial Boundaries*  *Provincial Institutional Quality Index*  quartile 1  quartile 2  quartile 3  quartile 4 |

Figure 3 Regional migration balance and Institutional Quality Index

|  |
| --- |
| Graduate migration balance 2004-2007 (%) |

Piedmont

Valle D’Aosta

Lombardy

Trentino

Veneto

Friuli V.G.

Liguria

Emilia Romagna

Tuscany

Umbria

Marche

Lazio

Centre-North

Abruzzo

Molise

Campania

Puglia

Basilicata

Calabria

Sicily

Sardinia

South

0

-40%

-20%

20%

40%

0

.2

.4

.6

.8

Institutional Quality Index

**Appendix**

**Sensitivity analysis**

This section develops a sensitivity analysis to test the response of institutional index in alternative scenarios obtained by attributing to the five considered dimensions weights different from Kd of Table 2[[21]](#footnote-22). Table 7 reports the constructed scenarios and relative weights. In the first five scenarios, a weight of 0.4 is assigned to one of the dimensions and 0.15 to all the others (see scenario 1: *Voice oriented* = 0.4 and all others 0.15). In scenarios 6, 7 and 8 intermediate solutions were adopted, with distribution of weights designed to privilege some aspects rather than others (for example: scenario 6 *Law-oriented* in which a weight of 0.275 is assigned to *Rule of Law* and *Corruption* and 0.15 to all the others).

Table 7 Scenarios of the sensitivity analysis, distribution of weights

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Scenario** | **Voice** | **Government** | **Regulatory** | **Rule of law** | **Corruption** |  |
|  | *Weights* | | | | |  |
| 1 Voice-oriented | 0.40 | 0.15 | 0.15 | 0.15 | 0.15 | 1.00 |
| 2 Government-oriented | 0.15 | 0.40 | 0.15 | 0.15 | 0.15 | 1.00 |
| 3 Regulatory-oriented | 0.15 | 0.15 | 0.40 | 0.15 | 0.15 | 1.00 |
| 4 Rule of law-oriented. | 0.15 | 0.15 | 0.15 | 0.40 | 0.15 | 1.00 |
| 5 Corruption-oriented | 0.15 | 0.15 | 0.15 | 0.15 | 0.40 | 1.00 |
| 6 Law-oriented | 0.15 | 0.15 | 0.15 | 0.275 | 0.275 | 1.00 |
| 7 Public and private | 0.15 | 0.275 | 0.275 | 0.15 | 0.15 | 1.00 |
| 8 Social-oriented | 0.275 | 0.275 | 0.15 | 0.15 | 0.15 | 1.00 |

For each of the eight scenarios proposed we calculated provincial indexes and their mean value and carried out an analysis on their variability. In Table 8, we report mean value, standard deviation and coefficient of variation (CV). As one can see, the IQI is very close to average ****and of all the indexes calculated in the various scenarios, the one which has the closest CV to the average CV.

Table 8 Analysis of scenario variability

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scenario** | **\*** |  | CV | Rank |
| 1 Voice-oriented | 0.533 | 0.084 | 0.611 | 5 |
| 2 Government-oriented | 0.530 | 0.088 | 0.831 | 2 |
| 3 Regulatory-oriented | 0.581 | 0.088 | 0.545 | 6 |
| 4 Rule of law-oriented | 0.603 | 0.087 | 2.636 | 7 |
| 5 Corruption-oriented | 0.668 | 0.097 | 3.536 | 9 |
| 6 Law-oriented | 0.616 | 0.091 | 3.019 | 8 |
| 7 Public and private | 0.578 | 0.087 | 0.650 | 4 |
| 8 Social-oriented | 0.699 | 0.085 | 0.699 | 3 |
| 9 IQI | 0.563 | 0.084 | 1.233 | 1 |
| **Average** | - | - | 1.471 |  |
| **Note \*** The mean is normalised with the ideal distance method. | | | | |

In addition we estimated for each province which of the proposed scenarios yields the value closest to the mean over all scenarios. Also, during the analysis the following were determined:

1. An institution index for each province and for each scenario;
2. The mean of the indexes of the various scenarios for each province;
3. Deviation between the provincial index of each scenario and the mean of point 2;
4. Minimum deviations from the mean for each province and each scenario;
5. Verification of the scenarios with the largest number of minimum deviations.

Table 9 reports the results of the sensitivity analysis for the mean and the ranking of the eight scenarios hypothesized. As emerges from the first column, the IQI index reproduces 39 provinces, proving, as illustrated in the *Rank* column, to be the second best index in terms of distance from the mean of the scenarios hypothesized, second only to the *Government-oriented* scenario which produces an index that for 60 out of 107 provinces has the lowest deviation from the mean of the indexes of the various scenarios.

Table 9 Sensitivity analysis with respect to the mean

|  |  |  |
| --- | --- | --- |
| **Scenario** | **No. of provinces** | **Rank** |
| 1 Voice-oriented | 1 | 4 |
| 2 Government-oriented | 60 | 1 |
| 3 Regulatory-oriented | 1 | 5 |
| 4 Rule of law-oriented. | 1 | 6 |
| 5 Corruption-oriented | 0 | 7 |
| 6 Law-oriented | 0 | 8 |
| 7 Public and private | 0 | 9 |
| 8 Social-oriented | 5 | 3 |
| 9. IQI | 39 | 2 |

In conclusion, of the various scenarios the IQI is the one that comes closest to the intermediate values both of variability and of the mean. Also the *government-oriented* scenario has values that could be suitably used. However, given that the objective is to propose a *proxy* of the level of institutions, it seemed more consistent to generate weights distributed more fairly among all the dimensions identified, avoiding putting the stress on a single aspect (implementation of policies for the *government-oriented* scenario).

**References**

ACEMOGLU D., JOHNSON S. and ROBINSON J.A. (2001), *The colonial origin of comparative development: an empirical investigation*, American Economic Review, 91, pp. 1369-1401.

ACEMOGLU D. and ROBINSON J.A. (2008), *The role of institution in growth and development*, Commission on growth and development, Working Paper, 10.

AKARTE M, SURENDRA N, RAVI B. and RANGARAJ N (2001). *Web based casting supplier evaluation using analytical hierarchy process*. J Oper Res Soc 52(5):511-522.

AMIN A. and THRIFT N. (1994), *Globalisation, institutions and regional development in Europe*, Oxford University Press.

ARLACCHI P. (2007), *La mafia imprenditrice. Dalla Calabria al centro dell’inferno,* Il Saggiatore, Milan.

ARON J. (2000), *Growth and institutions: A review of the evidence*, The World Bank Research Observer, vol. 15, 1, pp. 1203–1228.

ARRIGHETTI A. and SERRAVALLI G. (eds.) (1999a), *Istituzioni intermedie e sviluppo locale*, Donzelli Editore, Rome.

BACCI S., CHIANDOTTO B., DI FRANCIA A. and GHISELLI S. (2008), *Graduates job mobility: a longitudinal analysis*, Statistica, pp. 3-4.

BARRO R. and LEE J. (1993), *Losers and Winners in Economic Growth*, NBER Working Paper, 4341.

BARRO R. and SALA-I-MARTIN X. (1995), *Economic Growth*, McGraw Hill.

BASILE R. and CAUSI M. (2007), *Le determinanti dei flussi migratori in Italia: 1991-2000,* Economia e Lavoro, 2, pp. 139-159.

BASILE R., CASTELLANI D. and BENFRATELLO L. (2009), *Le determinanti della localizzazione delle imprese multinazionali: l’attrattività dell’Italia nel contesto europeo*, in Rondi L. and Silva F. (eds.), *Prove di Cambiamento nel Sistema Produttivo Italiano,* Il Mulino, Bologna.

BAUMOL W.J. (1990), *Entrepreneurship: Productive, Unproductive, and Destructive*, Journal of Political Economy, vol. 98, 5, pp. 893–921.

BECKER S. (1964), *Human Capital*, The University of Chicago Press, Chicago and London.

BORJAS G.J. (1999), *The Economic Analysis of Immigration*, Handbook of Labor Economics 3 (Part.1), pp. 1697-1760.

BOWEN H. P. and DE CLERCQ D. (2008), *Institutional Context and the Allocation of Entrepreneurial Effort,* Journal of International Business Studies, 39, pp. 747–67.

BRUCCHI LUCHINO (2001), *Manuale di Economia del Lavoro*, il Mulino, Bologna.

BRUNETTI A. (1997), *Political Variables in Cross-country Growth Analysis*, Journal of Economic Surveys, vol. 11, 2.

CAMAGNI R. and CAPELLO R. (2008), *Territorial Capital and Regional Development in the EU*, (CD-ROM) XXIX Conferenza Italiana di Scienze Regionali, Bari.

CANNARI L., NUCCI F. and SESTITO P. (1997), *Mobilità territoriale e costo delle abitazioni: un’analisi empirica per l’Italia*, Temi di discussione, Banca d’Italia, 308.

CARRINGTON W.J., DETRAGIACHE E. and VISHWANATH T. (1996), *Migration with Endogenous Moving Costs,* American Economic Review, Vol. 86, 4, pp. 909-930.

CEBULA R. J. (2005), *Internal Migration Determinants: Recent Evidence*, International Advances in Economic Research, 11, 2, pp. 267–274.

CHANDA A. and DALGAARD C.J. (2008), *Dual economies and International total factor productivity differences: channelling the impact from institutions, trade and geography*, Economica, 75, pp. 629-661.

CIRIACI D. (2010), *University quality, interregional brain drain and spatial inequality. The case of Italy,* Luiss Lab of European Economics Working document, 87, Luiss Guido Carli, Rome.

DALL’AGLIO V. (1999), *Istituzioni intermedie e dinamica della distribuzione del reddito nelle province italiane: una verifica empirica non parametrica*, in A. Arrighetti and G. Seravalli (eds.), Donzelli editore, Rome.

DEFOORT C. (2008), *Tendances de long term de migrations internationals: Analyse à partir des 6 principaux pays receveurs,* Population, 63, pp. 285-318.

DE LA FUENTE A. (2006), *Education and economic growth: a quick review of the evidence and some policy guidelines*, in Globalisation challenges for Europe. Prime Minister of Finland's Office Publications, 18, pp. 195-212.

DI PIETRO G. (2005), *On Migration and Unemployment: Evidence from Italian Graduates,* Economic Issues, 10, 2, pp. 11-28.

DOCQUIER F. and MARFOUK A. (2006), *International migration by educational attainment (1990-2000),* in Ç. Özden and M. Schiff (eds.), *International migration, remittances and the brain drain,* pp. 151-199, Palgrave-McMillan, New York, USA,

DUSTMANN C. (1999), *Temporary migration, human capital and language fluency of migrants,* The Scandinavian Journal of Economics, vol. 101, 2, pp. 297-314.

DJANKOV S., LA PORTA R., LOPEZ DE SILANES F. and SHLEIFER A. (2002), *The regulation of Entry*, Quarterly Journal of Economics, 117, pp. 1-37.

EASTERLY W. and LEVINE R. (2003), *Tropics, germs and crops: the role of endowments in economic development*, Journal of monetary economics, 50, pp. 3-39.

EPSTEIN G.S., GANG I.N. (2010), *Migration and Culture,* Emerald Group Publishing Limited.

ETZO I. (2007), *Determinants of interregional migration in Italy: A panel data analysis*, MPRA Paper no. 5307, Munich, Germany.

FAGGIAN A., MCCANN P. and SHEPPARD S. (2007), *Some evidence that woman are more mobile than men: gender differences in UK graduate migration behaviour*, Journal of Regional Science, 3, pp. 517-539.

FAINI R., GALLI G., GENNARI P. and ROSSI F. (1997), *An empirical puzzle: falling migration and growing unemployment differentials among Italian regions*, European Economic Review, 41, pp. 571-579.

FLORIDA R. (2002a), *Bohemia and economic geography,* Journal of Economic Geography, vol. 2, 1, pp. 403-418.

FLORIDA R. (2002b), *The Rise of the Creative Class,*New York, Basic Books.

FLORIDA R. (2002c), *The Economic Geography of Talent,* Annals of the Association of Regional Geographers, 92, 4, pp. 743-755.

GIANNETTI M. (2001), *Skill Complementarities and Migration Decisions,* Labour, 15, 1, pp. 1-31.

GIANNETTI M. (2003), *On the Mechanics of Migration Decisions: Skill Complementarities and Endogenous Price Differentials,* Journal of Development Economics, 71, 2, pp. 329-349.

GIBSON J. and McKENZIE D. (2011), *The microeconomic determinants of emigration and return migration of the best and brightest: evidence from the Pacific,* Journal of Development Economics, vol. 95, 1, pp. 18-29.

GLAESER E., LA PORTA L.R., LOPEZ-DE-SILANES F. and SHLEIFER ANDREI A. (2004), *Do Institutions Cause Growth?*,NBER working paper, 10568.

GOLDEN M.A. and PICCI L. (2005), *Proposal for a new measure of corruption, illustrated with Italian data*, Economics and Politics, vol. 17, 1, pp. 37-75.

GROOT W. (1996), The incidence of, and returns to overeducation in the UK, Applied Economics, 28, 10, pp. 1345-1350.

GÜNGÖR N.D. and TANSEL A. (2009), *Brain Drain from Turkey: an investigation of students’ return intentions*, Applied Economics, vol. 40, pp. 3069-3087.

HALL R. and JONES C.I. (1999), *Why do some countries produce so much more output per worker?*, Quarterly Journal of Economics, 114, pp. 83-116.

HAQUE N.U. and KIM S.J. (1995), *Human capital flight: impact of migration on income and growth*, IMF Staff Papers, vol. 42, 3, pp. 577-607.

HARRIS J.R. and TODARO M.P. (1970), *Migration, unemployment and development: a two-sector analysis*, American Economic Review, vol.60, 1, pp.126-142.

HECKMAN J.J. (1979), *Sample Selection Bias as a Specification Error*, Econometrica, vol. 47, 1, pp. 153-161.

HELLIWELL J. F. and PUTNAM R. (1995), *Economic Growth and Social Capital in Italy*, Eastern Economic Journal, vol. 21, 3.

HICKS J. R. (1932), *The Theory of Wages*, London, McMillan.

ISHIZAKA A., BALKENBORG D. and KAPLAN T.R. (2010), *Does AHP help us make a choice? An experimental evaluation*, MPRA Paper No. 24213.

ISTAT (2009) Indagine ISTAT sull'inserimento professionali dei laureati dell'anno 2004.

JAEGER D., HOLGER B., THOMAS D., ARMIN F., DAVID H. and UWE S. (2010), *Direct evidence on risk attitudes and migration,* Review of Economics and Statistics, vol. 92, 3, pp. 689-692.

JAHNKE H. (2001), *Mezzogiorno e knowledge society: i rischi di spreco e fuga delle risorse umane*, Rivista Economica del Mezzogiorno, 4, pp. 749-62.

KAREMERA D., OGULEDO V.I. and DAVIS B. (2000), *A Gravity Model Analysis of International Migration to North America*, Applied Economics, Vol. 32, 13, pp. 1745-1755.

KAUFMANN D., KRAAY A. and MASTRUZZI M. (2010), *The worldwide governance indicators: methodology and analytical issues*, Policy Research Working Paper Series 5430, The World Bank.

KNACK S. and KEEFER P. (1997), *Does Social Capital Have an Economic Payoff? A Cross-country Investigation*, Quarterly Journal of Economics, vol. 112, 4, pp. 1251-1288.

KWOK V. and LELAND H. (1982), *An economic model of the brain drain*, American Economic Review, 72, pp. 91-100.

KWOK C. and TADESSE S. (2006), *National culture and financial systems*, Journal of International Business Studies, 37, pp. 227-247.

LA PORTA R., LOPEZ-DE-SILANES F., SHLEIFER A. and VISHNY R. (1998), [The Quality of Government](http://ideas.repec.org/p/nbr/nberwo/6727.html), [NBER Working Papers](http://ideas.repec.org/s/nbr/nberwo.html), 6727.

LEBLANG D.A., FITZGERALD J. and TEETS J. (2009), *Defying the Law of Gravity: the Political Economy of International Migration,* Working Paper, Department of Political Science, University of Colorado, Boulder.

LI X, BEULLENS P, JONES D. and TAMIZ M (2008), *An integrated queuing and multi-objective bed allocation model with application to a hospital in China*. J Oper Res Soc 60(3):330-338.

LOAYZA N.V., OVIEDO A.M. and SERVEN L. (2005), [*The impact of regulation on growth and informality - cross-country evidence*](http://ideas.repec.org/p/wbk/wbrwps/3623.html), [Policy Research Working Paper Series](http://ideas.repec.org/s/wbk/wbrwps.html) 3623, The World Bank.

LUCAS R.E. (1988), *On the mechanism of economic development*, Journal of Monetary Economics, vol. 99, pp. 3-42.

MALCZEWSKI J. (1999), *GIS and Multicriteria Decision Analysis,* John Wiley and Sons, New York.

MARINELLI E. (2011), *Graduates on the move : knowledge flows and Italian regional disparities : migration patterns of 2001 graduates,* London School of Economics and Political Science, University of London.

MARINELLI E. (2011), *Graduate migration in Italy - Lifestyle or necessity?,* ERSA Conference Paper.

MARINELLI E. (2012), *Sub-national Graduate Mobility and Knowledge Flows: An Exploratory Analysis of Onward- and Return-Migrants in Italy,* Regional Studies, DOI: 10.1080/00343404.2012.709608.

MASSEY D.S., ARANGO J., HUGO G., KOUAOUCI A., PELLEGRINO A. and TAYLOR J.E. (1993), *Theories of International Migration: a Review and Reappraisal,* Population and Development Review, Vol. 19, 3, pp. 431-466.

MAURO P. (1995), *Corruption and Growth*, Quarterly Journal of Economics, vol. 110, 3, pp. 681-712.

MINCER, J. (1984), *Human Capital and Economic Growth*, Economics of Education Review, 3, 3, pp. 95-205.

McGUINNESS, S. (2006), *Overeducation in the labour market*, Journal of Economic Surveys, 20, 3, pp. 387-418.

McGUINNESS A. (2007), *Institutions and Total Factor Productivity Convergence,* Economic Analysis and Research Department Central Bank and Financial Services Authority of Ireland, Research Technical Paper, 9.

McKENZIE D., RAPOPORT H. (2010), *Self selection patterns in Mexico-US migration: the role of migrant networks,* Review of Economics and Statistics, Vol. 92, 4, pp. 811-821.

MIYAGIWA K. (1991), *Scale economies in education and the brain drain problem*, International Economic Review, Vol. 32, 3, pp. 743-59.

MOCETTI S., PORELLO C. (2010), *La mobilità del lavoro in Italia: nuove evidenze sulle dinamiche migratorie*, Questioni di Economia e Finanza no. 61, Banca d’Italia.

MURPHY K.M., SHLEIFER A. and VISHNY R.W. (1991), *The Allocation of Talent: Implication for Growth*, Quarterly Journal of Economics, Vol. 106, 2, pp. 503–530.

MUSHI K. (2003), *Networks in the Modern Economy: Mexican Migrants in the U.S. Labor Market,* The Quarterly Journal of Economics, Vol. 118, 2, pp. 549-599.

NAPOLITANO O., BONASIA M. (2010), *Determinants of different internal migration trends: the Italian experience*, MPRA Paper no. 21734, Munich, Germany.

NARAYAN D. (1999), *Social Capital and the State: Complementarity and Substitution*, World Bank Working Paper 2167.

NARAYAN D. and PRITCHETT L. (1997), *Cents and Sociability: Household Income and Social Capital in Rural Tanzania, Social Development and Development Research Group*, Policy Research Working Paper 1796.

NIEDOMYSL T. (2006), *Migration and place attractiveness*, in “Geografiska regionstudier”, 68, Department of Social and Economic Geography, Uppsala University.

NIFO A., PAGNOTTA S., SCALERA D. (2011), *The best and brightest. Selezione positiva e brain drain nelle migrazioni interne italiane*, MPRA Paper, University Library of Munich, Germany.

NORTH D.C. (1990), *Institutions, institutional change and economic performance*, Cambridge University Press.

NUGENT J.B. (1993), *Between State, Market and Households: A Neo-institutional Analysis of Local Organizations and Institutions*, World Development, Vol. 21, 4, pp. 623-632.

OECD (2001), *Territorial Outlook 2001*, Organization for Economic Cooperation and Development, Paris.

ÖZDEN Ç., PARSONS C., SCHIFF M. and WALMSLEY T. (2011), *Where on Earth is everybody? The evaluation of global bilateral migration 1960-2000,* World Bank Economic Review, 25, pp. 12-56.

PEKKALA S. (2003), *Migration Flows in Finland: Regional Differences in Migration Determinants and Migrant Types*, International Regional Science Review, 26, 4, pp. 466-482.

PIRAS R. (2009), *How does internal migration by educational attainment react to regional unbalances?,* Conference on “Poverty traps: an empirical and theoretical assessment”, 30-31 October, Naples.

PISSARIDES C.A. and McMASTER (1990), *Regional migration, wages and unemployment: empirical evidence and implications for policy,* Oxford Economic Papers, 42, pp. 812-831.

POLGREEN L. and SIMPSON N.B. (2011), *Happiness and International Migration,* Journal of Happiness Studies, Vol. 12, 5, pp. 819-840.

PORTER M.E. (1997), New strategies for inner city economic development, Economic Development Quarterly, 11, 1, pp. 11-27.

PORTER M.E. (2003), The economic performance of regions, Regional Studies, 37, 6-7, pp. 549-578.

PUTNAM R.D. (1993a), *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press.

PUTNAM R.D. (1993b), *The Prosperous Community. Social Capital and Public Life*, American Prospect, 13, pp. 35-42.

RAFIQUI P.S. (2010), *Varieties of capitalism and local outcomes: A Swedish case study*, European Urban and Regional Studies, 17, 3, pp. 309-329.

RODRIK D. (1997), *Where Did All the Growth Go? External Shocks, Social Conflict and Growth Collapses*, NBER, Working Paper 6350.

ROMER P. (1990), *Endogenous technical change,* in “Journal of Political Economy”, Vol. 94, pp. 1002-1037.

RITSILA J. and OVASKAINEN M. (2001), *Migration and Regional Centralization of Human Capital*, Applied Economics, 33, 3, pp. 317-325.

RITZEN, J., EASTERLY W. and WOOLCOCK M. (2000), *On ‘Good’ Politicians and ‘Bad’ Policies: Social Cohesion, Institutions and Growth*, World Bank Working Paper 2448.

RODRIK D., SUBRAMANIAN A. and TREBBI F. (2004), *Institutions rule: the primacy of institutions over geography and integration in economic development,* Journal of Economic Growth, 9, pp. 131-165.

RUTTEN R. and GELISSEN J. (2008), *Technology, Talent, Diversity and the Wealth of European Regions*, European Planning Studies, 16, 7, pp. 985-1006.

SAATY T.L. (1980), *The Analytic Hierarchy Process*, McGraw-Hill, New York.

SAATY T.L. (1992), *The decision maker for leaders*, RWS Publications, Pittsburgh.

SAXENIAN A.L. (2006), *The New Argonauts: Regional Advantage in a Global Economy*, Harvard University Press, Cambridge, MA.

SCHULTZ T. W. (1961), *Investment in Human Capital*, The American Economic Review, 51, 1, pp. 1-17.

SJASTAAD L.A. (1962), *The Costs and Returns of Human Migration*, Journal of Political Economy, Vol. 70, 5, pp. 80-93.

VAN DALEN H.P. and HENKENS K. (2007), *Longing for the Good Life: Understanding Emigration from a High-Income Country*, Population and Development Review, 33, 1, pp. 37-65.

VENTURINI A. (1991), *Rassegna degli approcci economici allo studio dei fenomeni migratori*, Economia & Lavoro, 1, pp. 103-124.

VENTURINI A. (2004), *Post-War Migration in Southern Europe. An Economic Approach*, Cambridge University Press.

VIESTI G. (2005), *Nuove migrazioni. Il “trasferimento” di forza lavoro giovane e qualificata dal Sud al Nord*, Il Mulino, 4.

WANG G., HUANG S.H. and DISMUKES J.P. (2004), *Product-driven supply chain selection using integrated multi-criteria decision-making methodology*, International Journal of Production Economics, 91, pp. 1-15.

WOOLCOCK M. (1998), *Social capital and economic development: toward a theoretical synthesis and policy framework*, Theory and Society, Vol. 27, 2, pp. 151-208.

WORLD BANK (1997), *Migration and remittances,* The International Bank for Reconstruction and Development, ch. 3, pp. 75-93.

WORLD BANK (1997), *World Development Report 1997: The State in a Changing World*, Oxford University Press.

1. \* We thank Domenico Scalera, the journal’s editor and three anonymous referees for very helpful comments.

   ♥ Dipartimento SEGIS, Università degli studi del Sannio, [nifo@unisannio.it](mailto:nifo@unisannio.it) [↑](#footnote-ref-2)
2. ♣ Dipartimento DEM, Seconda Università degli studi di Napoli & Collegio IPE, [gaetano.vecchione@unina2.it](mailto:gaetano.vecchione@unina2.it) [↑](#footnote-ref-3)
3. By *Mezzogiorno* we mean all the regions in southern Italy, including the islands, namely Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicily and Sardinia. [↑](#footnote-ref-4)
4. A common approach to the determinants of migration is the one denominated “push and pull approach”: on the one hand, push factors, i.e. the characteristics of the country of origin which drive the individual to emigrate; on the other, pull factors, i.e. that set of opportunities offered by the destination region attracting workers (Kwok and Leland, 1982; Pissarides and McMaster, 1990; Miyagiwa, 1991; Venturini, 1991; Haque and Kim, 1995; Dustman, 1999; Güngör and Tansel, 2009) [↑](#footnote-ref-5)
5. This approach is consistent with the central idea of the human capital theory (Schultz, 1961; Becker, 1964; Mincer, 1984): building capacities through education bears costs and benefits. These latter are modeled to accrue mostly in the future, in the form of higher earnings (Marinelli, 2011). [↑](#footnote-ref-6)
6. This also explains the observed tendency of skilled workers to concentrate geographically in urban richer and more innovative areas (Ritsila and Ovaskainen, 2001; Giannetti, 2001 and 2003; Florida, 2002a, 2002b; Pekkala, 2003; Rutten and Gelissen, 2008). [↑](#footnote-ref-7)
7. To keep the same hierarchy framework as the WGI, we use a weight assignment technique called *Analytic Hierarchy Process* (AHP), which gives the possibility to adopt a multi-layer preconceived framework (in our case the hierarchy framework used by the WGI ). [↑](#footnote-ref-8)
8. The degree of openness of the economy is derived as the sum of imports and exports for each province. Data are drawn from the Tagliacarne Institute dataset (Atlante di competitività delle provincie italiane, 2001); . [↑](#footnote-ref-9)
9. The Italian term used for this practice is *commissariamento*. When there is substantive evidence of administrative mishandling or mafia infiltration, the local administration is dissolved and a *commissario* or special commissioner is appointed by the Ministry of the Interior to run the administrative unit in question. [↑](#footnote-ref-10)
10. The ISTAT survey on graduate employment refers to those who graduated in 2004 and were interviewed in 2007. [↑](#footnote-ref-11)
11. The AHP technique is widely used in a multicriteria decision environment (Malczewski, 1999). Applications of AHP are also reported in numerous fields such as supply chain management (Akarte *et al*. 2001), health care (Li *et al.* 2008), manufacturing (see Wang *et al.* 2004) experimental economics (Ishizaka *et al*. 2010) and many others. An advantage of AHP is in the possibility it gives to adopt from the beginning a preconceived framework (in our case the same hierarchy framework used by the WGI). In addition, it allows to exploit verbal judgments on the relative importance of elementary indexes made by researchers or panelists, by supplying a procedure to transform these judgments in a vector of weights. [↑](#footnote-ref-12)
12. For example, to assess the relative importance of the elementary index “Crime against PA” with respect to “Golden Picci Index” and “Special commissioners” in determining the “Corruption” dimension, AHP starts from pairwise comparisons between each of these indexes and each of the other two (i.e., “Crime against PA” versus “Golden Picci Index”; “Crime against PA” versus “Special commissioners”; “Golden Picci Index” versus “Special commissioners”). [↑](#footnote-ref-13)
13. Classifications of each dimension are available on request: *i) Voice and accountability, ii) Government Effectiveness, iii) Regulatory quality, iv) Rule of Law, v) Control and corruption.* [↑](#footnote-ref-14)
14. The survey was conducted periodically with the Computer Assisted Telephone Interviewing (CATI) technique, administering a detailed questionnaire to a large number of recently graduating individuals (in our case the survey was in 2007 and concerned 47,300 individuals graduating in 2004). The interviewed sample represents about 18% of the reference population (260,070 graduates in 2004, Student Registration Service, MIUR). Our data processing was carried out at the ADELE ISTAT laboratory in Naples, in compliance with regulations on personal data protection. The results and opinions expressed are the exclusive responsibility of the authors and do not constitute official statistics. [↑](#footnote-ref-15)
15. Measuring the migration phenomenon with changes in residence leads to a very cautious estimate of the actual number of migrations. In practice, there are many cases in which the migrant maintains residency, at least for a certain number of years, in his/her area of origin. [↑](#footnote-ref-16)
16. As illustrated above, the IQI index is expressed at a provincial scale. The regional values were determined by appropriately weighting for the resident population. [↑](#footnote-ref-17)
17. The procedure *à la* Heckman assumes that the errors of the two equations are normally distributed with zero mean and variance, and are correlated among themselves: ~, independent of the set of covariates  and . It is possible to test the null hypothesis that the two errors are not correlated:  with a specific Wald test. Rejecting the hypothesis  of zero correlation, we may state that in the model there is no problem of self-selection and the estimators are not biased. Finally, for the goodness of the estimates, as suggested by Heckman (1979), it is necessary that in the *selection equation* there is at least a variable included in  and not present in  of the first-stage equation. [↑](#footnote-ref-18)
18. The results of the first-stage equation are available on request. [↑](#footnote-ref-19)
19. In all, 3,456 (7.3%) students in the ISTAT sample participated in the Erasmus project, while 43,844 (92.7%) went through a regular degree course. [↑](#footnote-ref-20)
20. We should also point out that, in this specification, the effect of the *unemployment rate* variable in the province of origin loses significance. Instead, there are no major changes as regards the other unemployment rate, GDP and net monthly salary in the provinces of origin and destination. [↑](#footnote-ref-21)
21. The same work was carried out by drawing up different scenarios in the context of the weights assigned to the elementary indexes. Despite the different proposals, no notable variations were detected in considering the indirect impact of these elementary indexes on the final index. In practice, our investigations confirmed that the real source of variation in the final index is in the weights of dimensions which, for the way the model is constructed, have a direct impact on the same index. [↑](#footnote-ref-22)