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Drivers of interregional migration flows: jobs or amenities?

by

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ABSTRACT

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For the equilibrium approach of migration individuals move to improve the quality and the quantity of amenities, while for disequilibrium approach, individuals move to improve economic conditions. The purpose of this work is to investigate alternative explanations that can reconcile the equilibrium and disequilibrium theories of migration. Specifically, the work explores whether distance can be seen an intervening factor that, under certain circumstances (i.e. sticky people due to strong territorial identity/attachment and family ties), might change the effect of different types of drivers in the decision to migrate. In such cases, economic variables are expected to play a stronger role in explaining long distance migration, while amenities are expected to be more important in explaining short distance migration. In order to even consider the possibility of living far away from the regions/family of origin, individuals should be compensated with higher income, and amenities play a secondary role. Conversely, short distance migration allows for strong and frequent contacts with family/friends; hence, the same type of individuals are expected to move shorter distances in order to improve their overall quality of life through improvement in the amenities, such as better schools, public services, or natural amenities. For this type of movement, economic improvements are expected to play a secondary role.

This issue is investigated by applying a spatial interaction model to 10.506 bilateral migration flows among Italian provinces. Italy represents an interesting case study because Italians are very attached to their regions of origin (strong territorial identity), internal migration is very low and people are very sticky. Moreover, previous research on Italy finds empirical evidence supporting long and shot distance migration. However, none of the previous studies explains the reasons for the difference between short and long distance migration. This study provides some initial evidence that long distance migration between Italian provinces better conforms to the expectations of a disequilibrium model of migration, while in contrast short distance movements between relatively closer provinces show some features of the equilibrium model of migration. Moreover-and most importantly -the obtained results reconcile the contrasting results of previous research based on EU and US cases. If identity plays a role in explaining migration behaviour within or between countries place-based policies should adapt accordingly.

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INTRODUCTION

Economists and other social scientists have been studying migration for more than a century. From the economic approach, migration occurs when individuals and families evaluate the costs and benefits of their location opportunities and eventually select the location that maximises the difference between benefits and costs. Individuals do not move when the costs of relocation are perceived as higher than the benefits.

Economic research on migration drivers investigates two main interconnected matters: the individual characteristics of internal migrants (i.e. who moves?) and the main reasons for their movements (i.e. why move?). According to the theoretical model of Sjaastad (1962), both younger and more educated people are more likely to move. These individual patterns have been confirmed by empirical research (Greenwood, 1969; Van Dijk et al*.,* 1989; Clark and Cosgrove, 1991; Plane, 1993; Kennan and Walker, 2011). Furthermore, according to the findings of applied research, individuals with high human capital are willing to migrate longer distances (Faggian and McCann 2006, 2009a, b, McCann et al., 2010).

The factors driving interregional migration flows are complex and debatable, while their relative importance depends on the theoretical approach adopted. In the standard neoclassical models, internal migrants follow economic opportunities such as wages, unemployment and prices. Specifically, for Sjaastad (1962), individuals move from local labour markets where the return on their individual skills is relatively low to markets where this return is relatively high. However, as search models explain, the impossibility of obtaining information about all potential jobs may leave individuals in 'second best' locations; yet, even in search models, the decision to migrate is fundamentally driven by job opportunities. For Fielding (1992), individuals migrate to improve socio-economic status. For the new economic geography approach, workers prefer variety and choose to locate in large manufacturing regions where lower transportation costs allow them to consume a larger variety of goods at lower costs (i.e. they can enjoy a better quality of life with a lower cost of living).

For Florida (2002a, b), creative and talented people select cities with inhabitants that are open-minded and tolerant and that have a large set of cultural amenities.

The present work focuses on neoclassical regional models of migration and specifically on the so-called disequilibrium and equilibrium models. In the 1970s–1980s, scholars debated the role of amenities versus economic factors as drivers of interregional migration. In reality, the foundations of the debate are deeper and more complex than this and include the interpretation of interregional economic disparities. These two positions have been called the 'disequilibrium' and 'equilibrium' approaches, respectively. Disequilibrium models (Muth, 1971; Greenwood, 1975, 1985; Greenwood and Hunt, 1984) assume that interregional economic disparities reflect the utility differential. Thus, they interpret interregional migration as almost entirely an economic phenomenon and a 'by product' of employment search. In other words, homogenous individuals react to disequilibria in wages and unemployment by moving to areas where the level of wages is higher and unemployment is lower; this process continues until interregional wage equilibrium is eventually restored and the utility of homogenous individuals is equalised. However, these models assume that because of imperfect information and sticky wages, disparities do not clear so easily: adjustments in labour markets are very slow and require a long time span. Therefore, situations of interregional disequilibrium can be persistent over time and this is the main reason for these models being named disequilibrium. On the other hand, the equilibrium models (Graves 1980, 1983) suggest an alternative view of migration drivers, the base assumption being that individuals prefer living in places with better amenities and therefore need to be economically compensated for living in places characterised by disamenities or a low level of amenities. Conversely, individuals are willing to accept lower wages to live in a place with higher amenities. From a macroeconomic perspective, interregional differences in wages are interpreted as partial compensation for spatial variations in non-tradable, non-economic factors. Consequently, interregional wages are never expected to clear if space remains non-homogeneous in terms of amenities. An important implication is that economic opportunities act as compensating differential and interregional disparities signal differences in place-related amenities but

not in the utilities of homogeneous individuals that are equalised in all locations. In such models, individuals migrate when personal factors (e.g. the household life cycle) or exogenous factors (e.g. the relative price of amenities, economic development, change in income and supply of local amenities) change the level or type of required amenities.

Earlier studies widely viewed disequilibrium and equilibrium approaches as antagonistic, producing an intense debate. The core of the debate was whether migration in developed countries is driven mainly by supply side factors (jobs) or demand side factors (amenities). Currently, the core question remains unsolved. Studies on interregional migration are divided into (1) papers quoting equilibrium literature à la Graves (1980, 1983); (2) papers quoting disequilibrium literature à la Greenwood (1975, 1985) and (3) papers quoting both, which raises problems associated with the different types of theories and implications that each approach implies. The empirical evidence is inconclusive and the issue of whether equilibrium drivers prevail over disequilibrium drivers is far from settled.

The latest evidence from the United States suggests that non-economic factors such as natural amenities are key drivers of interregional migration. It also suggests that the growth of cities is highly dependent on the migration induced by spatial sorting of skills and the interactions of these skills with consumption of urban amenities (Glaeser et al., 2001; Florida, 2002 a, b; Adamson et al., 2004; Shapiro, 2006). Internal mobility rates are higher in the United States than in Europe. Net migration between regions of similar size in the United States is 15 times greater than in Europe (Cheshire and Magrini, 2006). However, the differences are not simply in terms of degrees of mobility. The vast majority of evidence from Europe suggests that interregional migration is driven primarily by jobs and is mainly a response to spatial differences in economic opportunities such as wages and employment (Cheshire and Magrini, 2006). However, based on the US findings, many scholars are convinced that individual utilities arise mainly from the consumption of amenities, at least in North America. From this point of view, the lack of widespread evidence for the European case is explained by resistance to proper compensation caused by the greater institutional, cultural, historical and linguistic variations across the continent. Scholars who are proponents of disequilibrium

would respond that the evidence for the relatively lower effect of disequilibrium drivers in the United States or elsewhere is most probably due to data limitations, such as miscalculations of real wages (income) or other economic variables, omission of important economic variables (the Jackman and Savoury argument, 1992) or the necessity to control for the probability of finding a job (the Harris and Todaro argument, 1970).

Moreover, a recent analysis on internal migration in Europe takes the debate further: the findings confirm that natural amenities significantly affect the relative attractiveness of sub-national territories across the European Union; this suggests that even Europe may be much more similar to place-based preferences like the United States (Ketterer and Rodriguez-Pose, 2012).

In analysing the contrasting results of recent studies, can we definitively say that the debate is over? It seems quite clear that, first, the empirical evidence offers rather mixed results; second, the solution might not be a simple 'either/or' but is probably more complex; third, more research is needed on this topic.

Starting from these stylised facts, the purpose of this work is to investigate alternative explanations that can reconcile the equilibrium and disequilibrium theories of migration and to demonstrate why 'job versus amenity' matters for regional policies.

Empirical evidence suggests that the importance of different types of drivers is highly related to individual preferences – which are in turn dependent on individual characteristics such as education, age, gender and marital status – but also to place or country-specific cultural characteristics. The role of cultural attitudes toward migration is understudied and probably underestimated.

Therefore, is it possible that individuals in different places – *ceteris paribus* their economic situation, education, gender and age – have different attitudes towards migration?

We explore the hypothesis that territorial or family attachment affects the general attitude toward migration as this specific question is underexplored in migration literature. In countries characterised by strong identity and/or territorial or family attachment (like EU and Mediterranean countries) or where family ties are strong and

social capital is low, it is more likely to find sticky and immobile individuals – *ceteris paribus*. An important driver of migration is therefore the level of social capital and family capital, or more specifically, the ties or linkages with relatives and friends in the places of origin and destination.

In this context, distance also plays a role. In regional models of migration, distance is considered a proxy for transport and psychic costs and as such, is expected to show a negative sign – that is, the longer the distance, the higher the costs of moving and the lower the probability of migrating. Furthermore, in such models, migration flows are analysed all together as if they were a single migration phenomenon. Therefore, for instance, short or long distances are considered the same type of movement, with the only difference being that long distance movements are relatively more costly. Conversely, the main point of this study is that the length of migration is strongly interconnected to territorial attachment and family ties.

Specifically, the present work explores whether distance can be seen as an intervening factor that, under certain circumstances (i.e. sticky people due to strong territorial identity/attachment and family ties), might change the effect of different types of drivers in the decision to migrate. In other words, this study explores whether in countries where people are sticky with particularly strong territorial attachment or family ties, long distance migration occurs in order to gain economic improvements. In such scenarios, in order to even consider the possibility of living far away from their regions/family of origin, individuals should be compensated with higher income, because amenities play a secondary role in this type of migration. In these cases, quality of life depends on the amount of interaction with family and friends; hence, economic variables are expected to play a stronger role in explaining long distance migration rather than short distance migration. Conversely, short distance migration allows for strong and frequent contacts with family/friends; hence, the same type of individuals are expected to move shorter distances in order to improve their overall quality of life through other types of amenities, such as better schools, public services, and natural amenities. For this type of movement, economic improvements are expected to play a secondary role.

The main aim of this study is to investigate the differences between long distance and short distance migration within Italy. There are many reasons for the decision to explore this specific case study. First, Italians are very attached to their regions of origin (strong territorial identity), internal migration is very low and people are very sticky: even in the presence of sharp and persistent economic disparities like that which occurred in the mid-1970s and mid-1990s, internal migration was very low. This pattern of migration has been named the 'empirical puzzle' (Faini et al., 1997). Second, for Bansfield (1958) and other scholars after him, the type of family attachment and low social capital of the southern regions of Italy are at the origin of their underdevelopment (Putnam, 1993; Guiso et al., 2004, 2007a, b). Third, previous works on Italian migration have already identified different features of long and short distance interregional migration. Specifically, Bonifazi and Heins (2000), using internal migration statistics in Italy for the time span 1955–1995, find evidence of long and short distance flows. More specifically, Etzo (2011), investigating the determinants of bilateral migration flows for a panel of Italian regions and for the time span 1996–2002, finds empirical evidence supporting long distance South to North disequilibrium migration.

However, none of the previous studies on Italian migration explains the reasons for the difference between short and long distance migration. Furthermore, most migration research in Italy has examined interregional flows among larger areas, either regions or groups of regions, and has not examined the differences in the drivers of movements of different lengths (Attanasio and Padoa-Schioppa, 1991; Faini et al., 1997; Daveri and Faini, 1999; Cannari et al., 2000; Furceri, 2006; Basile and Causi, 2005; Etzo, 2008).

The fourth and last reason for choosing Italy as our case study is the availability of data on bilateral migration supplied by the Italian National Institute for Statistics (ISTAT). Specifically, this study makes use of a large dataset at a provincial level (county level in the United States; NUTS 2[1] in the European classification). The dataset allows modelling a matrix of interprovincial movements from 10,506 observations.

Why is the job versus amenities debate still so important and what are its implications for regional policies? Urban and regional economists are undecided on the targets of

[1] NUTS 2 is the second of the three levels of the Nomenclature of Territorial Units of Statistics.

place-based policies, specifically whether 'people follow newly created jobs into regions, or whether jobs follow newly arrived migrants' (Partridge and Rickman, 2003, p. 76). The answer has important implications for regional policy. If people follow jobs, regional and local policies should target firms; conversely, if jobs follow people, regional and local policies should target individuals. Regional policies have higher direct costs and need time to be implemented. Therefore, any mistake in the target not only makes the policy ineffective but also has very high opportunity costs. Specifically, the present study investigates the hypothesis that people follow jobs under certain circumstances and follow amenities in others. If this is so, place-based policies should have different targets. Looking exclusively at the internal reallocation of individuals, if the hypothesis of long and short distance migration is confirmed by the empirical applications, at least for the case of Italy, policies attracting firms would be associated with mainly long distance interregional movements, and then not many, since individuals are sticky due to high territorial attachment or strong family ties. Conversely, policies based on amenities would attract people moving shorter distances (mainly neighbouring regions). However, if firms (or local governments) aim to attract high human capital individuals from other internal territories, they should also pay attention to the type of urban amenities provided locally; however, again, it is likely that in regions with high territorial attachment or strong family ties, policies targeting high human capital will attract mainly short distance migration or maybe international migrants with high human capital. Unfortunately, this last hypothesis cannot be investigated in the present study since the matrix of interregional flows is not disaggregated for human capital content. To investigate whether long and short distance migration matters for migrants with high human capital would require a further development of the present work along with a deeper analysis of the connection between strong territorial identity and the probability of migration.

The present study is structured into five main chapters. Chapter 1 focuses specifically on economic theories of migration and the role of distance in migration models. It starts by defining internal migration and focuses on the interdisciplinary nature of the subject, the microeconomic and macroeconomic models of migration including new economic

geography approach and multiple equilibrium models. In this chapter specific attention is given to disequilibrium and equilibrium models that are the main focus of the present work.

Chapter 2 examines the findings of the empirical research regarding the effects of different migration drivers, and the evidence for equilibrium and disequilibrium migration in the United States and Europe. The second part of chapter discusses the research questions and original contributions of the present study and why analysing the case of Italy is suitable for the purpose of the present study.

Chapter 3 is devoted to the methodology and empirical strategy followed in applying part of the work; specifically, it presents the general model, the estimation method and empirical strategy (count models and specifically: negative binomial and generalised method of moment, GMM) .

Chapter 4 explains the data, the case study under analysis, the source and distribution characteristics of the dependent variable that is province-to province migration flows in Italy for the period 2001–2002. In the second part the chapter describes the independent variables in the light of previous theoretical and empirical literature.

Chapter 5 shows the results obtained with the performed econometric analysis. Therefore, the chapter illustrates the results associated with each of the three performed models using negative binomial estimator (model 1: all migration flows together; model 2: long distance migration; model 3: short distance migration). Robust check of the obtained results is performed by means of GMM models and instrumental variables technique.

The final part of the thesis highlights the main conclusions of the entire study and further developments. This study provides some initial evidence that long distance migration between Italian provinces better conforms to the expectations of a disequilibrium model of migration, while in contrast short distance movements between relatively closer provinces show some features of the equilibrium model of migration. Moreover-and most importantly-our results differ markedly from previous research which suggests that EU migration either depends on disequilibrium drivers, while amenities play no role

(Cheshire & Magrini,2006), or that amenities are very important for interregional migration across European regions (Rodriguez-Pose and Ketterer, 2012).

CHAPTER 1

DEFINITIONS, CONCEPTUALISATION AND THEORETICAL MODELS OF INTERNAL MIGRATION

1.1 Introduction

The main purpose of this chapter is to offer an overview of the theoretical models on the drivers of interregional migration with specific focus on the neoclassical economic models and spatial models (gravity, spatial interaction and new economic geography models of migration). The chapter starts introducing some definitions of the phenomenon under investigation (Section 1.2 and Subsection 1.2.1). Studies on interregional migration are interdisciplinary in nature; hence, before analysing thoroughly the economic and other theoretical approaches, Section 1.3 and, in particular, Subsection 1.3.1 are dedicated to early studies on interregional migration (specifically, the seminal work of the geographer Ernst G. Ravenstein and the theory of the escalator region of the geographer Anthony J. Fielding). Theoretical economic models of migration are illustrated more in depth in the following parts of the chapter starting from the general microeconomic model of migration (Section 1.4), and more specific human capital and job search models, (Subsections 1.4.1, 1.4.2, 1.4.3). Section 1.5 analyses interregional supply of and demand for labour and the neoclassical model of interregional migration at a more macroeconomic level. In this context, ample analysis and discussion are dedicated to the neoclassical models under investigation: that is, the disequilibrium and equilibrium models (Subsections 1.5.1, 1.5.2, 1.5.3, 1.5.4). Subsection 1.5.5 describes the approach of Harris and Todaro (1970) and the more recent findings of Fothergill and Gudgin (1982). The former provide one of the most quoted and famous models explaining rural-to-urban interregional migration. Subsection 1.5.6 is dedicated to the implications of selective migration of individuals for human capital and interregional economic performances (the possibility of having

multiple equilibrium outcomes due to agglomeration externalities and human capital productivity spillovers). Section 1.6 illustrates geographical and economic models specifically devoted to examining the role of distance for migration flows in spatial interactions models (Subsection 1.6.1) and new economic geography models (Subsection 1.6.2). The main conclusions of the analysis of the theoretical models are illustrated in Section 1.7.

1.2 Definition and conceptualisation of internal migration

Migration is a type of spatial mobility that takes place when an individual changes place of residence within or outside the native country. The International Organisation for Migration (IOM) of the United Nations defines the migrant as the individual that takes the decision to migrate '*freely…for reasons of "personal convenience" and without intervention of an external compelling factor'* (IOM, 2004, p. 40).

Therefore, compared to other types of mobility such as movement of refugees migration is a free decision to change place of residence within or out country. For the United Nations, the time limit for which an international spatial movement can be measured as migration is a change of residence greater than one year (IOM, 2004).

Internal migration is defined as '*…a move from one migration-defining area to another (or a move of some specific minimum distance) that was made during a given migration interval and that involved a change of residence.'* Therefore the migrant is defined as *'…a person who has changed his usual place of residence from one migrating-defining area to another (or who moved some specific minimum distance) at least once* (United Nations, 1970: p. 2).

The economic literature considers two main types of migration: 1) residential mobility and 2) proper internal migration. The former is normally short distance migration, while the latter is usually long distance migration. Following Borjas (2000), '*residential migration occurs when the household (or person) changes its place of residence by moving from one neighbourhood to another within the same local area…*'; and

…*internal migration occurs when the household moves across larger geographically distinct units – such as counties, metropolitan areas, states or provinces – but remains within the same country*' (p. 1). This definition implicitly considers internal migration as a change of both residence and job. Hence, a residential movement that does not involve a job change cannot be considered proper internal migration, but simply as residential mobility.

New migrants are individuals who move for the first time; repeat migrants move more than once (Kau and Sirman, 1976) and return migrants move back to their place of birth (Vanderkamp, 1971)[2]. Migration that occurs *ex post* the search process and with a job in hand is called contracted migration. On the contrary, migration that occurs *ex ante* the job search is called speculative migration. In the former, moving is the result of the search process; in the latter, it is part of the search process itself (Mohlo, 1986).

According to the findings of the applied literature, the propensity to migrate is expected to be different in heterogeneous individuals; therefore, it changes with employment status, type of employment, education and human capital (Swartz, 1973; Borjas, 1992; Hunt and Mueller, 2004), age (Greenwood, 1969; Greenwood and Hunt, 1984; Plane, 1993; Plane and Heins, 2003), gender and marital status (Mincer, 1978; Graves and Linneman, 1979) and culture and ethnicity (Graves, 1979). The propensity to migrate is also linked to established social relationships between new and previous migrants. Chain migration occurs when '…*prospective migrants learn of opportunities, are provided with transportation, and have initial accommodation and employment arranged by means of primary social relationships with previous migrants*' (McDonald and MacDonald, 1964, p. 82). The regional economist Edgar M. Hoover refers to the same type of migration when he explicitly defines the beaten-path effect as the tendency of some migrants to choose areas in which they have friends or relatives (Hoover, 1971).

[2] Da Vanzo (1978) defines repeat and return migrant as the 'chronic migrant'.

1. 2. 1 Internal migration

The principal way in which migration is classified refers to the political boundaries of the movement. Any cross-country movement is considered international migration, while migration that occurs within country is considered internal migration.

Internal migration can be divided into two main sub-types depending on the internal administrative boundary: 1) interregional migration, in the case of movements between states or regions (states in the United Kingdom and United States, regions in England and Italy), and 2) intraregional migration, in the case of movements inside a single state or region (counties in England and the United States, provinces in Italy).

Dealing with intraregional data to study migration is complicated since the majority of such movements are residential in nature. However, the problem of disentangling proper migration from residential mobility is common to any type of study that uses administrative data rather than more advanced classifications such as those based on contiguous areas beyond the administrative boundaries where people live and work (e.g. Local Labour System in Italy, Functional Urban Region in the EU). In most cases, researchers are forced to use administrative data, and the length of movement is used as a means of isolating migration from residential movements.

1. 3 Early studies on internal migration

Studies on human migration are interdisciplinary in nature. The literature on internal migration is extremely vast[3]; Cushing and Poot (2004) counted more than 12,000 articles on the topic in economics. Geographers, sociologists, demographers and economists have analysed the topic from different perspectives. Geographers explored the phenomenon as early as the late 19th century with the seminal work of Ravenstein (1885) on the United Kingdom. This work is particularly relevant and it has been defined

[3] In order to build a framework that can be useful for the purpose of the present work, various literature reviews have been examined carefully (Greenwood, 1975, 1985, 1997; Mohlo, 1986; Greenwood and Hunt, 2003; Cushing and Poot, 2004; Etzo, 2008).

as the first systematic study on internal migration (Greenwood, 1997; Greenwood and Hunt, 2003). After an accurate analysis of the British Census Data on the nativity of the population and their place of residence for 1881, Ravenstein formulated 7 'Laws of Migration' (see Table 1.1).

Table 1.1 Ravenstein's Laws of Migration

1st Law. We have already proved that the great body of our migrants only proceed a short distance, and that there takes place consequently a universal shifting or displacement of the population, which produces 'currents of migration' setting in the direction of the great centres of commerce and industry which absorb the migrants. In forming an estimate of this displacement we must take into account the number of natives of each county which furnishes the migrants, as also the population of the towns or districts which absorb them.
2nd Law. It is the natural outcome of this movement of migration, limited in range, but universal throughout the country, that the process of absorption would go on in the following manner: The inhabitants of the country immediately surrounding a town of rapid growth, flock into it; the gaps thus left in the rural population are filled up by migrants from more remote districts, until the attractive force of one of our rapidly growing cities makes its influence felt, step by step, to the most remote corner of the kingdom. Migrants enumerated in a certain centre of absorption will consequently grow less with the distance proportionately to the native population which furnishes them, and a map exhibiting by tints the recruiting process of any town ought clearly to demonstrate this fact.
3rd Law. The process of dispersion is the inverse of that of absorption, and exhibits similar features.
4th Law. Each main current of migration produces a compensating counter-current.
5th Law. Migrants proceeding long distances generally go by preference to one of the great centres of commerce or industry.
6th Law. The natives of towns are less migratory than those of the rural parts of the country.
7th Law. Females are more migratory that males.

Source: Ravenstein (1885).

Despite being fairly descriptive, the work of Ravenstein is recognised to be particularly important for migration research since many laws have been confirmed by extensive research carried out in subsequent periods (see Greenwood, 1997; Greenwood and Hunt, 2003).

Sociologists expressed interest in the topic from the early 20th century when the process of urbanisation attracted their attention[4]. One of the most important works in the field is that of Dorothy Swain Thomas (1938). This study deals with the determinants of migration (migration differentials) and the connected topic of selective migration (the

[4] The reconstruction of the stages of early migration studies from different disciplines has been brought about thanks to the work of Greenwood and Hunt (2003).

individual characteristics of migrants such as age, sex, education and motivation (Greenwood and Hunt, 2003).

Internal migration as a specific stream of economic research started to develop from the late 1950s. Traditionally, it deals with the spatial allocation of labour in the field of labour economics. However, the role of economic factors as migration drivers has been recognised since Ravenstein (see for instance the 1st Law in Table 1.1). In 1932, the economist John Richard Hicks in his famous work *The Theory of Wages* clearly regards economic opportunities as the main determinant of migration, despite consideration given to the role of other determinants (Hunt, 1993).

In regional economics, migration has been analysed on two main grounds: the determinants of migration (why people move) and the impacts of migration on local economies. The present work deals with the former line of research.

1.3.1 Internal migration and the escalator region

From an individual perspective, Fielding (1992) considers migration as a way to achieve socio-economic status that is very difficult to obtain in the region of origin. Individuals with the same characteristics and endowments in different regions may have completely different careers path simply because, by chance, they were born and live in different places. Hence, in countries where regions offer different socio-economic perspectives to resident populations, migrating towards more dynamic places offers a chance to achieve an upward social class escalator.

The work of Fielding focuses specifically on the role of London's metropolitan city region as a socio-economic escalator for intergenerational mobility. According to the scholar, a region acts as social escalator when it 1) draws many young educated migrants at the beginning of their working life; this type of population is more likely to leave the previous location in search of career advancements (they have lower psychic and direct costs of movement compared to their married and older counterparts); 2) gives the possibility of faster social mobility to young, educated and 'ambitious' individuals, both migrants or

locally born (within region mobility through local labour and housing markets); and 3) has a high proportion of out-migrants at the older stage of their careers or close to retirement; these out-migrants are the same that experienced upward social mobility in the previous stage.

By making use of two large datasets, namely the Longitudinal Studies (LS) of the Office Population Censuses and Surveys (OPCS) and the National Health Services Central Register (NHSCR), Fielding investigates the socio-economic and geographical situation of a consistent number of individuals (500,000 in total) over 11 years (1971–1981). He confirms that the metropolitan region of London acts as an escalator, indeed it promotes faster socio-economic mobility compared to other regions, is a pull factor for young educated individuals living in other regions, and is a push factor for the same type of people at a later stage of their career. Furthermore, Fielding highlights how the relationship between individuals and their place of residence depends on the social class of the individual, that is whether he belongs to the working class or middle class. From Fielding's point of view, the efforts of upgrading socially to middle class requires some skills such as '*knowledge of, and ability to handle, non-locally based information, codes, rules, and system of thought and action*', and for Fielding this '*cultural capital*' is associated with what he calls '*social confidence*' (p. 15). Fielding anticipates what would become evident later on: the development of the knowledge economies in attracting quality, ambitious and talented human capital fosters economic growth of regions. In the case of London, Champion (2011) investigates the third stage of the escalator hypothesis, adding to the analysis the decade 1981–1991. He finds that return migration occurred at an earlier stage compared to that predicted by Fielding. This is a very important result that probably depends either on the improved capacity of other British regions to pull younger migrants or on the specific characteristic of young and talented individuals to be highly mobile geographically.

1.4 Modelling migration in economics

The theoretical literature on interregional migration does not provide different models for international and internal migration. From an individual point of view, the decision to migrate depends on the comparison between benefits and costs attached to each location. If the movement takes place inside the national boundaries, it means that living in internal locations produces higher net benefits for migrants. Therefore, the decision to migrate is the result of a rational choice. Assuming individuals are mobile and informed, the decision to migrate will be based on a comparison of the expected utilities of each location. Hence, the utility of the *i*-th location for the *k*-th individual can be formally expressed as

$$U_i^k = u(X_i) + e^k \tag{1.1}$$

where the total utility *U* includes a deterministic part *u* and a stochastic part e^k. The deterministic part *u* is, in turn, a function of *X*, that represents all independent variables that can affect utility in the location of origin.

An individual will decide to migrate from location *i* (origin) to location *j* (destination) if the expected utility on the destination is greater than the expected utility at the origin plus the costs of relocating:

$$(\mathrm{EU}_j^k) > (\mathrm{EU}_i^k) + C_{ij} \tag{1.2}$$

where EU_j^k is the expected utility of *k*-th individual in the destination, EU_i^k is the expected utility of *k*-th individual in origin, and C_{ij} is the cost of relocating from *i* to *j*.

Following Equation 1.2, the expected utilities can vary according to individual-related characteristics (such as age, gender, education and marital status) and place-related determinants, either economic or non-economic (such as types of amenities and social

relations). Migration takes place for improving individual utility and both individual-related and place-related drivers are included in the *X* variables of Equation 1.2.

The model analysed above represents a general model of individual migration. However, at a microeconomic level, the literature refers to regional and labour economics and is divided into two main approaches: the human capital theory and the job search theory. The majority of migration studies in urban and regional science use the former theoretical background; the latter is used mostly in labour and international economic literature. These approaches are presented as opposite due to the different ways they consider information and economic uncertainty. However, both regard migration as a means to improve utilities.

1.4.1 Human capital approach to migration

The standard economic framework of migration is due to the work of Sjaastad (1962) that applies the concept of human capital to migration decisions à la Becker (1962)[5]. This model is called the endogenous human capital model of migration because the individual is seen as being rationally and perfectly informed first on deciding how to invest in education and skills acquisition in order to maximise future earnings (lifetime utilities: income and job satisfaction), and then on deciding whether and how to migrate on the base of this initial investment. Migration will take place where the discounted expected returns in earning are the highest. According to this framework, after the investment in education and skills the individual calculates the net present value of future income streams in all alternative locations and migrates where the present discounted value of expected returns is the highest. This model is considered one of the most influential in migration studies (Zimmerman and Bauer, 2002). The formal representation of Sjaastad is due to Mohlo (1986) and is summarised here.

[5] The human capital model was developed during the late 1950s–1960s by Mincer (1958), Schultz (1961) and Becker (1962).

Suppose there are just two regions, the origin *i*, and the alternative region *j*. The individual in region *i* calculates the expected utilities *E(U)* in the two locations as the discounted present value of expected returns deriving from living in region *i* and *j*:

$$E\left\{U\left[R_i(0)\right]\right\} = \int_0^T \exp(-rt)U\left[R_i(t)\right]dt \quad (1.3)$$

$$E\left\{U\left[R_j(0)\right]\right\} = \int_0^T \exp(-rt)U\left[R_j(t)\right]dt \quad (1.4)$$

where *T* is the individual working time horizon, *R* is the expected return and *r* is the subjective discount rate in the current time period *t*=0. The integer indicates that such decisions are not discrete[6]. The discounted present value of expected costs *C* of re-locating to *j* is:

$$E\left[C_{ij}(0)\right] = \int_0^T \exp(-rt)\left[C_{ij}(t)\right]dt \quad (1.5)$$

Therefore, migration from *i* to *j* will take place when, considering the cost of relocating from *i* to *j,* the expected return in location *j* is higher than location *i*:

$$E\left\{U\left[R_i(0)\right]\right\} < E\left\{U\left[R_j(0)\right]\right\} - E\left[C_{ij}(0)\right] \quad (1.6)$$

This can be rewritten as:

$$\int_0^T \exp(-rt)U\left[R_i(t)\right]dt < \int_0^T \exp(-rt)U\left[R_j(t)\right]dt - \int_0^T \exp(-rt)\left[C_{ij}(t)\right]dt \quad (1.7)$$

[6] In the case of a discrete process, the integer should be substituted by the summation Σ. For an example of a migration decision à la Sjaastad using a discrete process, see Partridge et al. (2012).

The net present values expected in all locations in turn may vary crucially with individual characteristics such as the age of the worker[7].

The model illustrated in Section 1.4 can be considered a generalised version of individual migration à la Sjaastad (1962)[8].Sjaastad divides the returns and costs of migrating into private and social. Social costs and returns are those externalities arising from migration. The private returns depend upon money and non-money factors.

The money returns of migrations (*R*) are those advantages in earnings deriving from '*a change in nominal earnings, a change in costs of employment, a change in prices, or a combination of these three*' (p. 86). They are not necessarily related to the increase of nominal earnings but can be related to '*the migrant capacity as consumer*' (p. 86). Particularly important for the scope of this work is the role of wages in the decision to migrate. If local wages decrease (due to a local decrease in labour demand or an increase in labour supply), workers will have lost capital and might decide to re-invest by migrating toward places with higher wages. According to Sjaastad (1962), if the loss of wages is local, migration represents a way to improve returns. Conversely, when the loss of wages affects the sector at a national level, workers might decide to invest in the acquisition of new skills; this does not necessarily imply migration. Non-money returns depend upon individual preferences for place-related characteristics such as climate, smog and congestion[9].

The money costs of migration (*C*) are '*…the increase in expenditure for food, lodging, transportation (for both migrants and their belongings)…*' (p. 83). They are divided into two further types '*…opportunity costs – the earnings foregone with traveling, searching for and learning a new job*' (p. 84); and the psychic costs related to the detachment from relatives and friends.

[7] '*Young persons will typically have made only a small investment in themselves through training for and experience in a specific occupation and a relatively large one through formal education; whereas a larger portion of the investment in older persons presumably arises from skill and experience specific to a particular employment.*' (Sjaastad, 1962, p. 84)

[8] Equation 1.2 does not include the time horizon of the individual. In Sjaastad (1962), *t* refers to the working life of the rational potential migrant.

[9] Sjaastad (1962) includes another type of return called '*pure consumption'* that is *'the satisfaction or dissatisfaction the migrant receives in the course of his actual travel'* (p. 86).

One of the main shortcomings of the Sjaastad model is the assumption of perfect information. Sjaastad's paper nevertheless remains one of the most quoted in migration studies in the field of urban and regional economics.

1.4.2 Search models and migration

Some migration studies use as a theoretical background the job search theory developed during the 1970s as an alternative to the neoclassical model. This approach relaxes the two main assumptions of the previous models: 1) perfect information and 2) migration as a result of wage/income differentials among different regions.

In job search theory, individuals look for jobs in a dynamic sequential process that takes place in a context of imperfect information and uncertainty. The impossibility of obtaining information about all potential jobs may leave individuals in 'second best' locations or they may not move at all, with a final outcome of frictional unemployment (Faggian, 2012). Following Mortensen (1984, p. 7[10]) the job search is a sequential process and '*the worker is viewed as sampling wage offers one at time and deciding on the basis of the sample obtained to date whether or not to stop the search or to continue.*' That is, the jobs are appraised one at a time and the size of the sample is a random variable that depends on the 'stopping rule' (p. 7). As Molho explains, the main purpose of such literature is to find 'the *optimal stopping rule*' (1986, p. 402).

Search models are very complicated and formalised. Migration literature applies them in examining two types of movements (Mohlo, 1986): those occurring *ex post* the search process and with job in hands (contracted migration); and those occurring *ex ante* (i.e. before) the job search (speculative migration). In the former, moving is the result of the search process; while in the latter it is part of the search process itself[11].

[10] The standard model of Mortensen (1984) relies upon a set of assumptions: a) random distribution of wage offers *F*(.), and any offer is a random sample of this distribution; b) the distribution of the number of offers per period and the wage distribution are known and constant over time (conversely, individuals do not know the wages associated with future job offers); c) job seekers are unemployed and receive one job offer per period; d) no recall for the job offer of the previous period is allowed; e) individuals have infinite lifetimes; and f) when an offer is accepted, it leads to permanent job with a fixed wage per period.

[11] One of the most quoted studies on speculative migration is that of Rogerson (1982), while in respect of contracted migration, Gordon and Vickerman (1982) and Jackman and Savoury (1992) are commonly quoted.

One of the most important contributions to modelling migration within the job search approach is the work of Jackman and Savoury (1992). Their application considers migration as a result of a job-matching process that occurs when a job seeker in a region of origin finds a job in an alternative destination region (contracted migration). They propose a hiring function in which, for simplicity, distance is considered to have no effect:

$$H = H(U,V) \tag{1.8}$$

Considering the whole economy, the total number of engagements *H* depends on unemployed people *U* and on the vacancy rate *V*. Where $\frac{\partial H}{\partial U} > 0$ and $\frac{\partial H}{\partial V} > 0$ means that at a national level the number of engagements increases with the number of people looking for a job (which in turn increases with unemployment) and with the number of job vacancies. Therefore, considering inter-regional relocation:

$$M_{ij} = H\left(\frac{U_i}{U}\right)\left(\frac{V_j}{V}\right) \tag{1.9}$$

Migration from *i* to *j* depends on the share of unemployment of region *i*, and the share of job vacancies in region *j*. If the former is indicated with $\hat{u}_i$ and the latter with $\hat{v}_i$, then Equation 1.9 becomes:

$$M_{ij} = H\hat{u}_i\hat{v}_j \tag{1.10}$$

Total out-migration is therefore:

$$M_i^{out} = \sum_{j(j\neq i)} M_{ij} = H\hat{u}_i(1-\hat{v}_i) \tag{1.11}$$

Out-migration from *i* rises as the share of unemployment in *i* increases, and conversely decreases as the share of job vacancies in *i* increases. On the other hand, total in-migration is:

$$M_i^{in} = \sum_{j(j \neq i)} M_{ij} = \sum_{j(j \neq i)} H\hat{u}_j \hat{v}_i \qquad (1.12)$$

In-migration to *i* increases as the share of unemployment increases in *j* and the share of vacancies increase in *i*.

This model explains the behaviour of aggregate migration starting with a microeconomic theory using job-matching and hiring function; and explains why in recessions, despite the sharp divergence among interregional unemployment rates, migration decreases instead of increases as predicted by the human capital approach. According to this approach, people react to interregional disequilibrium by migrating. Conversely, in Jackman and Savoury (1992), overall engagements decrease in recessions and '*firms adjust to reduced demand by cutting back on recruitment and this reduces the job opportunities for the unemployed, including those which involve moving from one region to another*' (p. 1448).

1.4.3 Comparing and reconciling the job search and human capital models

Uncertainty and scarce information may reduce migration. Carrington et al. (1996) investigate the Great Migration of black people from the South to the North of the United States by means of a dynamic model of migration in which the cost of migration decreases with the stock of previous migrants already settled in the destination (endogenous moving costs). Migration costs decrease since information is transmitted from previous migrants to prospective ones. Burda (1995) considers the possibility of postponing migration decisions in case of uncertainty or imperfect information about

future streams of income and introduces the option value to wait as a rational choice to acquire new information.

As pointed out by Faggian (2012), it is possible to partially reconcile human capital theory with job search theory by including the role of uncertainty of macroeconomic conditions among the determinants of the decision process. Consequently, the human capital model can be transformed by adding a probability function in which the net present value of future streams of income in the location is linked to the probability of finding a job in this location. This extension makes more flexible the use of the human capital model as a microeconomic basis for the study of aggregate analysis (interregional migration). Discounting also for the probability of finding a job, the human capital model gets closer to other types of models such as that of Harris and Todaro (1970). See Section 1.6.

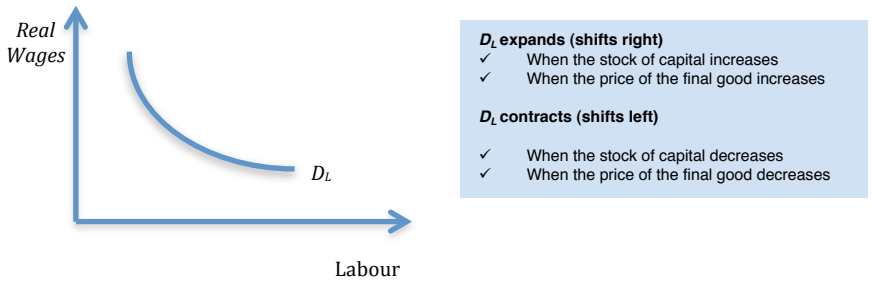
Job search models and human capital models (general neoclassical models) depend on individual characteristics: in both models, the propensity to migrate increases with education (see for instance Basker, 2003, with reference to the job search model and Greenwood 1975, 1993, with reference to neoclassical models). In human capital theory, better-educated individuals require higher returns for their investment, while in job search theory, better-educated people have higher reservation wages. Therefore, in considering the amount of investment in education and skills, individuals with high human capital (or individuals with high reservation wages) should migrate more than those with low human capital (lower reservation wages). This argument is known as the education selectivity of migration (Van Dijk et al., 1989, Clark and Cosgrove, 1991). According to the findings of applied research, individuals with high human capital should also be willing to migrate longer distances (Faggian and McCann 2006, 2009a, b. McCann et al., 2010)

At this point, the only real difference between the human capital and job search approaches is that in the latter, second best locations are allowed (see Faggian, 2012). The fact that individuals with higher human capital can have a more migratory attitude has implications that will be discussed in the conclusions of the chapter.

1.5 Modelling migration at the macroeconomic level: Regional labour migration in competitive markets

On the demand side of the labour market there are firms looking for labour; on the supply side there are individuals offering labour. The price of labour is the real wage[12]. Demand for labour ($D_{L)}$ depends negatively on real wages, that is, D_L is downward sloping (see Figure 1.1 below). Wages represent costs for firms; hence, the quantity of labour demand decreases as wages increase. Conversely, when wages decrease demand for labour increases. D_L also depends on other factors such as the capital stock (K) and the price of the output good (P). Changes in real wages cause movements along the D_L curve, while changes in K and P cause a shift of the D_L. Capital stock positively affects D_L; furthermore, K and L are complementary in that as capital stock increases, D_L rises for each level of wages (the curve shifts right). The opposite occurs when capital stock decreases. Also P positively affects D_L, with an increase of P being a good signal that firms will increase demand for labour for any given level of real wages (the curve shifts right); the opposite occurs when P decreases.

Figure 1.1 Labour Demand

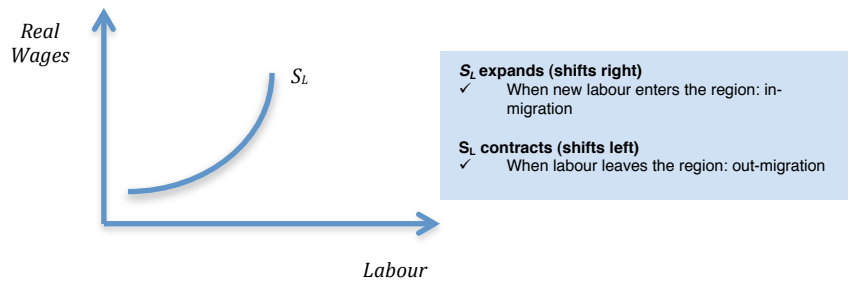


Supply of labour ($S_{L)}$ is upward sloping, so that as real wages increase the supply of labour increases as well, and vice versa. The slope of S_L is explained by the theory that

[12] This section is based on McCann (2001, 2013).

the hourly real wages represent for workers the possibility of consuming good and services. In other words, individuals allocate time between work and leisure, and hourly wages represent the opportunity cost of one hour of leisure: if hourly real wages increase, the opportunity cost of leisure increases as well, so that workers will dedicate more time to work and less to leisure; and conversely if wages increase. Consequently, S_L increases with rises in real wages and vice versa; hence, the curve is upward sloping.

Figure 1.2 Labour Supply



S_L shifts right if the number of workers for any level of real wages increases, and this shift occurs when new labour enters the region (in the case of in-migration). Conversely, the supply of labour shifts left when workers leave the region (in the case of out-migration)[13].

In equilibrium, at a given real wage the quantity of labour demanded is equal to labour supplied.

In the neoclassical framework unemployment can exist when is it voluntary (i.e. the individual's decision), and involuntary unemployment occurs only when frictions hamper the proper functioning of competitive markets. In this case, the markets are considered inefficient and are unable to match workers with jobs.

In this framework, the remedy to involuntary unemployment is to remove the frictions.

[13] As Armstrong and Taylor (2000) highlight, S_L shifts also as a consequence of natural population change: it contracts to accommodate deaths, and expands to accommodate newborns. Furthermore, S_L may shift left with a reduction in retirement age and an increase in the school-leaving age.

1.5.1 Neoclassical models of migration: Disequilibrium models

In the 1970s–1980s, one question sharply divided the neoclassical approaches to migration: the role of amenities versus economic factors as determinants of interregional migration. In reality, the foundations of the debate are deeper and more complex regarding individual spatial utility and the interpretation of interregional disparities in economic opportunities. These two positions have been called the disequilibrium and equilibrium approaches. As McCann (2001, p. 192) well explains, '*the "disequilibrium" model is the most commonly adopted model of interregional labour migration.*' The disequilibrium model of migration (from now on DM) considers interregional migration almost entirely an economic phenomenon and a by-product of the employment search (Muth, 1971; Greenwood, 1975, 1985; Greenwood and Hunt, 1984): that is, people react to initial disequilibria in wages[14] and unemployment by moving to areas where the level of wages is higher, while unemployment is lower. In a perfect competition model, migration responds to interregional economic differentials '*net of relevant costs*' (Hunt, 1993, p. 341). This approach assumes that interregional economic disparities reflect utility differentials. Disparities do not clear because adjustments in the labour market are slow and take place over the very long run due to differentials like imperfect information and sticky wages. Therefore, situations of interregional disequilibrium can be persistent over time, and this is the main reason these models are called disequilibrium models (this term has been used by Graves, 1980).

A deeper analysis of DMs is important at this point. The main assumption is that the market of outputs and inputs are in perfect competition[15]. Other assumptions are that migration is free (there are no transaction costs) and there are no barriers to movements (no friction). Factor of productions are homogeneous, price and wages are flexible and information is perfect. For simplicity, the economy has only two regions: region *A*, and region *B*. The two economies have the same production function,

[14] We always refer to real wages even when the word 'real' is omitted.
[15] This part is the result of Armstrong and Taylor (2000), McCann (2001), and Piras (2002).

technology and capital stock. The capital stock is immobile (again for simplicity[16]) so that the only mobile factor is labour. The national economy is closed and international inflows and outflows are not allowed. The production function of each region is:

$$Y_A = F(K_A, L_A) \tag{1.13}$$

$$Y_B = F(K_B, L_B) \tag{1.14}$$

where Y is the total production at time *t* in region *A* and in region *B* as a function of the quantity of capital (*K*) and labour (*L*), both available in each region at time *t*. Both factors are essential in the production:

$$F(K_t, 0) = 0 \; and \; F(0, L_t) = 0 \tag{1.15}$$

Therefore, it is assumed that *K* and *L* are complementary (even though there will be a certain level of substitution). The production function has constant return of scale given that an increase of all factor inputs will increase the output in the same proportion (Cobb-Douglas production function). However, each factor input taken individually follows the law of diminishing marginal returns: that is, the marginal productivity of each factor input decreases as the quantity of this factor increases (if the other factor input is given). Therefore, the total product rises with a marginal increase of one factor of production, but in a less than proportional way. This is because under perfect competition, it is assumed that in equilibrium, the marginal product of labour is equal to its marginal cost (the hourly wage).

Turning now to Region *A* and Region *B*, for simplicity suppose that initially the two economies are in equilibrium; therefore, they are the same size (in terms of labour and capital) and have the same wages (the reasoning does not change if, given the same assumptions, the example starts from a situation of disequilibrium):

[16] If capital is also allowed to move the consequences of this for regional development will be different according to the type of theoretical framework: one-sector or two-sector models of factor allocation (see McCann, 2001).

$$w_A = w_B \ ; \ L_A = L_B \tag{1.16}$$

Suppose that for whatever reason the demand for labour increases in *A* (D_L shifts right) and decreases in region *B* (D_L shifts left). Therefore two new equilibriums are set in *A* and *B* in terms of labour and wages, now $L_{A1} \neq L_{B1}$ and $w_{A1} \neq w_{B1}$, specifically, in the new situation:

$$w_{A1} > w_{B1} \tag{1.17}$$

$$L_{A1} > L_{B1} \tag{1.18}$$

With respect to the initial situation in region *A,* the level of employment increases while in region *B*, it decreases. Following the theory, because of the differential in wages, labour migrates from region *B* to region *A*: in region *A*, S_L increases (the curve shifts right); and in region *B*, S_L decreases (the curve shifts left). In region *A*, S_L increases while the stock of capital is unchanged; as a consequence, following the law of diminishing return, the marginal productivity of labour will decrease, so that the real wage tends to decrease as well. Conversely, in region *B*, the S_L decreases, following the same law, and since the capital stock remains unchanged, the marginal productivity of labour increases in this region, so that the real wage tends to increase as well. The process of migration will continue until the difference in real wages is positive. This process of decreasing wages in *A*, and increasing wages in *B*, will continue until interregional equilibrium is restored and wages in *A* and *B* return to the former level ($w_A = w_B$). However, in the new interregional equilibrium, the level of wages is the same but the size of the two regions is different, specifically $L_{A2} > L_{B2}$.

In DMs, people migrate when differences in wages arise (or when differences in economic opportunities arise). In this framework, a persistency in interregional disequilibrium is justified by the presence of '*frictions*' or obstacles to local labour market adjustments and by the recognition of the '*sluggish adjustment*' (Hunt, 1993, p. 342). The most important aspect of these kinds of models is that spatial differential in economic opportunities reflects spatial differential in workers' utilities.

To generalize, DMs have the following form:

$$NM_i = f(E_i) \tag{1.19}$$

where *NM* is net migration (in-migration minus out-migration) of workers in the area and E_i represent the economic determinants of region *i* that can affect net out-migration or net in-migration. These factors are represented by wage/income and employment/unemployment. Economic variables on the right side of the equation are expected to have significant coefficients and the attended sign. In the case of in-migration: the higher the wage/income/employment in *i*, the higher the in-migration (positive correlation); the lower the unemployment rate in *i*, the higher the in-migration (negative correlation). In the case of out-migration: the higher the wage/income/employment in *i*, the lower the out-migration (negative correlation); the higher the unemployment in *i*, the higher the out-migration (positive correlation).

As Goetz (1999) points out well, applied research on these models finds conflicting results in terms of both signs and significance of the economic variables. These findings will be further analysed in Chapter 2. However, scholars give two main justifications for such results (McCann, 2013). First, the lack of good statistical data or misspecification: very often data on real wages has been criticised for the calculation of cost of living (the denominator real wages; McCann, 2013). Furthermore, many works lack controls such as vacancy rates and aggregate level of hiring that should be added to income (or wages) and the unemployment rate. These two variables would allow for better accounting for both frictions in the labour markets and the general economic situation of the country (Jackman and Savoury, 1992; Westerlund, 1997). Second, real wage differentials never clear because in reality they are compensating for place-related amenities. Therefore, even though real wages are different over space, the utilities of (homogenous) individuals are the same. As such, since wages compensate for amenities differentials, it is perfectly normal to have unexplained results in models in which amenities are not controlled for. This argument is more related to the theory of

migration and, specifically, to the other neoclassical view of migration known as equilibrium.

1.5.2 Neoclassical models of migration: Equilibrium models

In the equilibrium model of migration (from now on EM), the movement of people relies not only upon economic factors but also upon a set of place-related amenities supplied in the place of origin and the destination (Graves 1976, 1980, 1983; Graves and Linneman, 1979; Knapp and Graves, 1989). The important implication is that economic opportunities act as compensating differentials and interregional differences among economic variables signal disparities in place-related and non-traded amenities but not necessarily in spatial utility. In this approach, an equilibrium situation is perfectly compatible with economic disparities but equal utilities of homogenous individuals.

The theoretical background for EMs is provided by the literature on urban quality of life[17] and 'compensating differentials' (Rosen, 1979; Roback, 1982; Blomquist et al., 1988[18]), for which the price of location-specific amenities is capitalised into local wages and rents[19]. The model interprets wages and rents as compensating for inter-regional differences in amenities. This means that the interregional difference in nominal wages for the same worker types (from the point of view of individual and job characteristics) compensates for the interregional difference in the level of amenities; consequently, interregional utility for similar groups of workers should be identical.

The urban economist Paul Graves (1980) applied this theory to interregional migration. Following Graves, the individual utility depends on the consumption of two broad categories of goods: traded and non-traded goods. Traded goods are exchanged

[17] See Lambiri et al. (2007) for a review of quality of life literature in economic and urban economics.

[18] The interpretation of regional differentials as compensating differentials in wages and housing rents is due to Roback (1982).

[19] The microeconomic foundation for this theory is supplied by Rosen in a different paper (1974) and is based on the economic theory of revealed preference and the new consumer theory of Lancaster (1966). For Lancaster, consumers of heterogeneous commodities have preferences for each characteristic of the final goods; therefore, they buy the set of characteristics rather than goods *per se*. The final price of the heterogeneous good embodies the implicit price of each specific characteristic. Rosen (1979) proposes the hedonic pricing method to calculate the implicit price of the quality of life in US cities that are embodied in housing rents.

between areas while non-traded goods are location-specific[20]; each point of space is characterised by the presence of a bundle of non-traded goods. Individual utility maximisation under budget constraint is

$$MaxU = U(X,C) \quad (1.20)$$

$$I = X + P_C C \quad (1.21)$$

The former equation represents the function of utility maximisation, where *X* is a vector of the numeraire tradable goods and *C* is a vector of non-traded goods. Initially, pure amenities are the only non-traded goods included in the analysis[21] in Graves (1980), as such amenities are linked mainly to the weather (temperature, wind velocity, humidity, warmth and cold).

The latter equation is the individual budget constraint in which *X* is the budget allocated to the tradable good and $P_C C$ is the budget allocated to amenities. As Graves explains, cities or regions can be viewed as bundles of local amenities; hence, real wages reflect differences in the bundles of amenities supplied in each location. As such, higher real wages reflect lower levels of amenities (or disamenities), and lower real wages are compatible with higher levels of amenities. As Graves and Knapp (1988) highlight, the US case seems close to a spatial equilibrium scenario since migration is high, as is information about residential alternatives. Consequently, '*locations with high levels of amenities have people move toward them until wages fall and/or rents rise sufficiently to render the level of satisfaction the same in all locations*' (p. 3). Therefore, in a situation of perfect (or good) information, and zero or low cost of movements, individuals choose where to locate according to their preferences for amenities.

As such, economic disparities between locations reflect equilibrium rather than disequilibrium because real wages compensate for the differences in location-specific amenities (Clark and Knapp, 1995; Goetz, 1999):

[20] The definition of traded and non-traded goods is due to Tolley (1974).
[21] For a list of the types of amenities included in the analysis, see Lambiri et al. (2007).

$$w = w(U^*, r, a) \quad (1.22)$$

where *w* is the wage; U^* is the indirect utility function that is the same across space; *r* represents rents; and *a* is the level of amenities. The function is called a wage acceptance function and can be represented by an indifference curve with combinations of wages and amenities that maintain constant the level of utility across space (see the 'w' curve in Figure 1.3). In order to live in places with high levels of amenities, individuals are willing to accept lower wages; in order to accept the presence of low amenities (or disamenities), people should be compensated with higher wages.

On the demand side, one important assumption is that firms know the role amenities play for workers and offer a wage that embodies such evaluation (in places with higher amenities, a relatively lower wage will be offered):

$$f = f(U^*, r, a) \quad (1.23)$$

where f is the wage that is offered by the firms, as a function of U^*; and *r* and *a* are as before ('*the higher the value of amenities, the lower that has be offered by firms,*' Goetz, 1999, p. 15). If wages fully or almost compensate for spatial differences in amenities, individual utility across space is equalised. As Figure 1.3 shows, wages and amenities are inversely related.

A more updated version of the equilibrium model is due to Partridge and Rickman (2003). This study does not enter into the details of the model but focuses on specific novelties. From the utility of residents à la Graves, Partridge and Rickman (2003) add the probability to locally consume the private good through employment earnings by inserting the suffix '*pr'* to the private and tradable good ('*X'* in Graves, 1980)[22]. Furthermore, they distinguish between the consumption of local public goods, assumed to be common resources financed by the tax rate[23] and location-specific amenities[24].

[22] In adding the suffix '*pr'*, Patridge and Rickman directly refer to Harris and Todaro (1970), see Section 1.5.4 of this chapter. The probability to consume the private good is higher when regional unemployment is lower and labour force participation is higher (Partridge and Rickman, 2003).

[23] Local private consumption is given by [(1-*t*)**W*], where *t* is the tax rate and *W* is the disposable income.

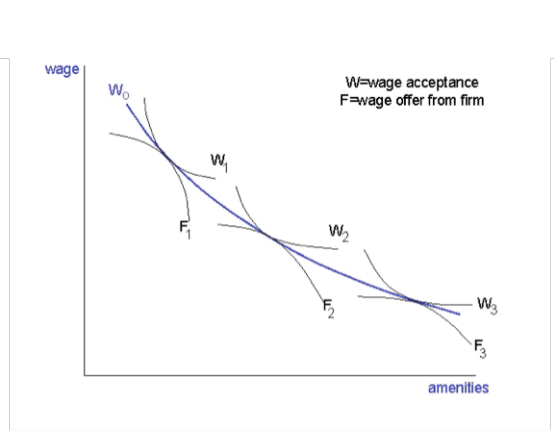
Overall, in EMs migration arises from changes in:

1. Demand of consumption amenities due to individual-related reasons such as household life-cycles;
2. National real incomes and development;
3. The relative price of amenities; and
4. The supply of location-specific amenities (Hunt, 1993).

The third determinant is well explained in Knapp and Graves (1989, p. 77) as the '*rise in real productivity everywhere (e.g. a human capital increment to society) causes people to demand more of normal or superior goods. Some of those goods are location-specific and can only be varied in quantity consumed by relocating. Hence, migration to areas, possessing, on net, normal bundles of location-specific traits is expected.*'

When the changes listed above take place, interregional utility among homogenous individuals will be not the same anymore; interregional differentials will soon be cleared by household migration, and migration will continue until the differentials are fully compensated for in real wages. In EMs, any change in individual utilities is quickly adjusted by means of migration.

Figure 1.3 Wage-Amenities Function



Source: Goetz, 1999.

At a macro level, EMs have the following form:

[24] The interesting element of this model is that local public goods depend positively on the population. However, this positive relationship holds only until a certain threshold, beyond which it switches to negative; the latter case occurs when congestion produces various types of diseconomies of scale. Also, the relationship between population and the stock of natural amenities follows the same pattern: when congestion occurs, the value of amenities decreases due to environmental degradation.

$$NM_i = (E_i A_i) \quad (1.24)$$

where *NM* is net migration (in-migration minus out-migration) of workers in the area *i*, *E* represents economic drivers such as wages/income or employment/unemployment; and *A* represents the vector of amenities of region *i* that can affect net out-migration (in case of disamenties) or net in-migration (in case of amenities). Therefore, in empirical applications of EMs, amenities should have positive, highly significant and stronger effects; and economic variables are included only to catch possible non-compensated differentials. For this reason their explanatory power is expected to be low.

1.5.3 Disequilibrium and equilibrium models: Comparisons and policy implications

DMs and EMs are neoclassical in nature because they rely upon perfect competition markets (i.e. neither recognises the role of economies of scale). However, both assume that even in the presence of positive costs – such as physical and psychological – — migration takes place when the utility of relocating is higher than that of staying in the present location, or when the net present value (NPV) à la Sjaastad (1962) is positive.

Probably, the main differences between the two approaches, both in the beginning and in more recent evolutions, can be classified according to the way they consider:

1) the process of adjustment of the labour market;

2) the role of compensating differentials;

3) the relative importance of economics opportunities versus amenities (economic and non-economic place-related characteristics);

4) the policy implications.

These factors are related to each other. Empirical applications of DMs explain the difference in real wages as due to frictions to perfect functioning of the labour markets (they are supposed to be rather inefficient in terms of matching demand and supply).

Therefore, labour market adjustments need a long time span to take place; possible compensations of economic differentials are likely to take place in the long run. In the short and medium term, spatial differentials in economic opportunities represent utilities differentials and market disequilibrium. As Hunt (1993, p. 342) well points out, '*although the disequilibrium view recognizes*[25] *that amenity factors can cause migration and that spatial differentials in wages and rents can incorporate a compensating component, the belief that the adjustment process is lengthy leads to the assumption that the spatial variations in wages and rents reflect primarily non-compensating variations and therefore utility differentials.*'. This means that if we consider labour markets as inefficient, economic opportunities are expected to be the main drivers of migration and utility is persistently different among places (because wages and rents do not compensate for the difference).

Conversely, in EMs when a good level of information is available (like in many countries such as the United States), labour and property markets are efficient (or very close to efficiency), as well as migration processes. Therefore, any interregional difference of utility will be arbitraged away by means of migration until labour and land markets fully compensate the difference; this mechanism allows for spatial equilibrium to be restored quickly. Spatial equilibrium implies that utility is homogenous along space. Specifically, EMs assume '*…utility identical in homogenous groups across labour markets, …'* and *'…utility identical in homogenous groups in residential markets*' (Knapp and Graves, 1989; p. 75). In Ems, migration is driven mainly by the consumption of amenities, and when economic disparities arise, they are seen as 'temporary' non-compensating differentials.

Contrary to DMs, EMs assume that non-economic factors (place-related amenities) have the stronger influence.

The general policy implications of DMs are the removal of all types of frictions that prevent labour markets from working properly. At a more local level, place-related policies in poorer regions should focus on attracting firms (production), and people

[25] Here Hunt (1993, p. 74) recognises the role (although marginal) of '*some local differences*' called '*indirect attractions of living in certain localities.*' Hunt refers to previous disequilibrium literature and specifically to Hicks (1932).

(consumption) will follow. On the other hand, one of the main consequences of EMs is that they exclude the need for place-based policies to attract people or firms because markets are efficient enough to compensate quickly for any change in utilities. Nevertheless, when frictions to such adjustments arise, place-related policies should be oriented to attract people (consumption), and firms (production) will follow.

The debate about which models better explain migration determinants was particularly strong between 1980 and 1990. Currently, the role of amenities has been widely recognised and included in the mainstream of migration models. Nevertheless, the debate about which model actually prevails remains fundamentally unresolved. This study discusses the policy implications of the two approaches in Chapter 2 (specifically Subsection 2.3.2).

1.5.4 Special cases of modelling migration at a macroeconomic level: Rural-to-urban and urban-to-rural migration

One famous model of interregional migration is due to Harris and Todaro (1970) which belongs to the so-called '*dualistic models of economic development*' (Lewis, 1954). These models explain the transition from a purely rural/traditional economy to a more modern industrial one[26]. While agricultural sectors prevail in rural areas, manufacturing sectors prevails in urban areas. In this model, migration is driven by economic opportunities and is discounted from the probability of finding a job. Therefore, this study assumes that the economy is characterised by two sectors: agricultural in rural areas and manufacturing in urban areas. The production functions of the two areas are the following[27]:

$$Y_M = f_M(L_M, \bar{K}_M, \bar{A}_M), \tag{1.25}$$

$$Y_A = f_A(L_A, \bar{T}, \bar{K}_A, \bar{A}_A), \tag{1.26}$$

[26] The traditional sector uses a technology based on a higher–labour capital ratio; conversely, modern sectors use a technology based on a lower labour–capital ratio.

[27] There are many versions of the Harris and Todaro (1970) model; here it is presented in the simplified version of Piras (2002).

The production function (represented in Equation 1.25) indicates that the output in the manufacturing sector (*M*) is a function of the quantity of labour allocated in this sector (L_M), the physical capital (K_M) and the available technology (A_M). The production function (represented in Equation 1.26) suggests that the output in the agricultural sector (*A*) is a function of the quantity of labour allocated in the sector (L_A), the available land for agriculture (*T*), the physical capital (K_A), and the available technology (A_A). In both sectors, the technology and the capital are given, as well as the land in the agricultural sector. Therefore, in both sectors, labour is the only input that it is allowed to vary. The economy is closed (there is no possibility of international migration). In both sectors, the law of diminishing marginal returns of each factor input holds; consequently, if the marginal factor of production increases – —the amount of the other production factor is fixed – —then the marginal output increases initially and starts to decrease with further marginal increases of the factor input[28]. Considering only labour (other factors are given), that means

$$Y_M = f_M(L_M), \qquad f_M^{'} > 0, f_M^{''} < 0 \tag{1.27a}$$

$$Y_A = f_A(L_A), \qquad f_A^{'} > 0, f_A^{''} < 0 \tag{1.27b}$$

The individual firm in both sectors operates in perfect competitive markets so that it is a price taker (i.e. the price of goods and wages are given). Therefore, the firm will hire workers (in terms of hours of work) until the marginal productivity of the worker is equal to the marginal cost (the hourly wage). The purpose of firms is to maximise profits (i.e. the difference between total revenue and total cost):

$$\underset{L_M}{Max}\,\Pi_M = f_M(L_M) - w_M L_M, \tag{1.28a}$$

[28] Of course, this is a short-term condition in which all the other factors are fixed. The first derivative of $f_M^{'} > 0, f_A^{'} > 0,$ indicates that initially the production in the manufacturing and agricultural sectors increases as the marginal quantity of labour increases; while $f_M^{''} < 0, f_A^{''} < 0,$ suggests that marginal output decreases with further marginal increases of labour.

$$\underset{LA}{Max}\,\Pi_A = f_A(L_A) - w_A L_A, \tag{1.28b}$$

where Π_M and Π_A are respectively the profit in *M* and in *A*, and $f_M(L_M)$ and $f_A(L_A)$ are the total revenues in *M* and in *A*. So that in equilibrium, the profit is maximised when

$$f_M^{'} = w_M \tag{1.29a}$$

$$f_A^{'} = w_A \tag{1.29b}$$

In equilibrium, the marginal product (or marginal revenue) is equal to the marginal cost (hourly wage) in both sectors.

At this point, two important (and realistic) assumptions are specified in the model. First, in urban areas wages are sticky downwards[29] and are set at a higher level compared to the equilibrium wage ($\overline{w} > w_M$); hence, in urban areas firms pay $\overline{w}$ to workers, while in rural areas wages can easily reach equilibrium. This is because in urban areas, wages are sticky: that is, the probability of finding a job is lower than 1 as excess supply of labour over demand for labour, due to the wage, is higher than equilibrium.

Consequently, the latter assumption is that workers decide whether to migrate or stay by comparing their expected income in rural and urban areas. The expected income is given by the disequilibrium wage multiplied by the probability of finding a job; therefore rural-to-urban migration will take place if the expected wage in urban areas (calculated by considering also the probability of finding a job) is higher than the expected wage in rural areas:

$$\overline{w}\frac{L_M}{L - L_A} > w_A \tag{1.30}$$

So that in equilibrium:

[29] Wages are sticky for institutional reasons such as the presence of trade unions.

$$\bar{w}_A \frac{L_M}{L - L_A} = w_A \tag{1.31}$$

In such cases, migration flows stop and urban areas experience positive unemployment. The Harris and Todaro model has been used to explain internal migration in economies in transition toward urban industrial development. In this model, migration is a 'pull' phenomenon attracted by the 'expected' rather than the real wage differential (Tahir, 1999). This process occurred in many countries at the beginning and during the industrialisation process, when rural-urban shift occurred. This is, for instance, the case of Italy from World War II to the 1950s–1960s) while migrants from the southern rural regions moved to the northern ones (see Etzo, 2012).

As Fothergill and Gudgin (1982) point out, starting from the late 1960s, the opposite phenomenon of urban-rural shift occurred in many Western countries. In the United Kingdom, this trend is particularly evident starting from the late 1960s. Specifically, employment decreases in cities and growths in small and relatively rural towns. According to Fothergill and Gudgin (1982), the reasons for these counter-flows depend on the slow growth of manufacturing firms in cities compared to small towns. After considering many other possible causes, Fothergill and Gudgin conclude that the main reason for the shift is the higher proportion of '*city-based firms finding themselves in location where they are unable to expand because their factories are hemmed-in by existing urban development*' (p. 112). Cities face this particular situation irrespective of the mix of industrial structure, corporate status or types of firms. The outcome of this process is that firms stop growing in cities, while the capital intensity of production increases due to restrictions of physical expansions; as a result, employment falls. Therefore, according to Fothergill and Gudgin, the rise of towns and rural regions is a direct consequence of the '*lack of room for expansions*'; in this view, urban-rural shift of firms has driven migration of labour. The Fothergill and Gudgin analysis supports the 'people follow jobs' hypothesis.

1.5.5 Selective migration, agglomeration economies and multiple equilibrium outcomes

In classical disequilibrium, people migrate for job reasons (i.e. people follow jobs). Turning to the example of a closed country with two identical regions in terms of stock of capital (immobile) and labour (mobile) and labour homogenous factors experiencing constant returns of scale: initially the regions have the same size ($L_B = L_A$) and are in equilibrium ($W_B = W_A$). When a change occurs, for instance, an increase of labour demand in *A* and a decrease in *B*, the first effect is an increase in wages in *B* and a decrease in *A* ($W_B > W_A$)[30]. Disparities in economic opportunities and the reduction of labour in *A*, leads labour to move from *A* to *B*. Depending on how labour moves to region *B*, the supply curve of labour in *B* expands (shifts right) and decreases in region *A*. Therefore, wages start reducing in *B* and increasing again in *A*. The process of interregional migration from *A* to *B* migration will continue until $W_B = W_A$. Eventually equilibrium is restored but it is very likely that the two regions have different population ($L_B > L_A$).

What happens if the assumptions of fixed stock of capital and homogeneous labour are relaxed? According to the human capital or education selectivity theory, when region *B* experiences economic advantage ($W_B > W_A$), individuals with high human capital (education and skills) living in *A* will move fast towards *B.* Such types of individuals have the most migratory attitude (see Sjastaad's argument); this attitude is also confirmed in a situation of imperfect information (search models). As they move in *B*, the labour supply increases in *B* and decreases in *A* (as in the previous example). However, this would not lead to a re-equilibrating mechanism. To understand this point, it is fundamental to look at the stock of capital in the two regions. The regional stock of capital consists of both physical and human capital (see Becker's argument); therefore, as higher human capital individuals move to *B*, the stock of capital in *B* increases and decreases in *A*; as such, the demand for labour increases in *B* and decreases in *A*, and the same occurs at the relative marginal product and wages (increases in *B* and

[30] The example is taken from McCann (2013).

decreases in *A*). For the agglomeration economies argument (Glaeser et al., 1995, 2003) this would allow for a cumulative growth in *B* and economic decline in *A*. In such instances, it is very likely that the process of convergence will start as soon as density in Region *B* exceeds a certain threshold, and diseconomies of scale and disamenities arise to counteract the positive effect of agglomeration economies and amenities.

1.5.6 Innovation, agglomeration economies and the creative class argument

Some scholars have pointed out that cities and regions are at the centre of innovation since they foster the interactions between workers and firms (Jacobs, 1969). A fundamental role in the innovation process is played by production externalities of human capital accumulation (Lucas, 1988). Some studies demonstrate that cities or regions with better educated people grow faster than others (Glaeser et al., 1995) and that cities or regions with high urban amenities grow faster that those with low amenities (Glaeser et al., 2001). The last contribution is particularly important for this work because it lies between DMs and EMs. Glaeser et al. (2001) show that even in situations in which cities or regions are economically homogenous, it is the difference in urban amenities rather than natural amenities that plays a role in attracting high human capital individuals. Workers with higher education and human capital are expected to choose locations that pay better wages and that are pleasant to live in terms of amenities. It is as if specific kinds of people follow jobs and amenities (Glaeser et al., 2001).

In his bestseller book, Florida (2002a) suggests the importance of cultural amenities such as movie theatres, bars, museums, art galleries, restaurants and trendy shops, along with tolerant and open-minded inhabitants of cities to attract the so-called creative class. For Florida (2004), creativity is not necessarily related to educational attainment; creative people are highly innovative, they are able to find original solutions, they produce new ideas and new technologies, they are highly mobile and their presence is

associated with higher urban growth. The creative class is therefore identified by the kind of jobs they hold rather than their education endowment. Specifically, the distinction includes the '*creative core'* of individuals working in '*science and engineering, architecture and design, education, arts, music, entertainment*' (Florida, 2004, p. 8); including creative professionals working in '*business and finance, law, health care and relative fields*' (p. 8) and so-called '*bohemians'* or individuals working in cultural and artistic occupations. According to Florida, jobs follow people, and if cities or regions want to grow, they should attract the creative class. Therefore, the presence of such kind of individuals will attract firms. Wages should reward creative people for the role they play in the production of innovation.

The work of Florida has been criticised on three main grounds: first, because the concept of creative class overlaps that of human capital (Glaeser, 2005; Hansen and Niedomysl, 2008), the majority of people belonging to the creative class have high human capital endowment. Therefore, the presence of a highly educated workforce fosters urban or regional growth rather the creative class *per se*; second, the definition of creative class is too broad and includes extremely different types of occupations (Markusen, 2006), even those that are not rewarded with higher wages such as bohemian graduates (Comunian et al., 2010); third, there is rather mixed empirical evidence on the role of the creative class for regional economies (Hansen and Niedomysl, 2008; Boshma and Fritsch, 2009; Marrocu and Paci, 2012).

Therefore, migration of individuals with high human capital towards big cities seems to follow both disequilibrium and equilibrium arguments. Such individuals are normally young for the age selectivity of migration, and their type of migration is expected to follow jobs as well as (urban) amenities.

1. 6 The role of distance in migration studies

In the early models of interregional migration, movement is free and space enters as a '*geographical distribution of opportunities*' (Molho, 1986, p. 397). Conversely,

Ravenstein (1885) considers explicitly the role of distance as a determinant, for instance, in the 1st law of migration. He states, '*We have already proved that the great body of our migrants only proceed a short distance … In forming an estimate of this displacement we must take into account the number of natives of each county which furnishes the migrants, as also the population of the towns or districts which absorb them*.' In the 5th law, he continues, '*Migrants proceeding long distances generally go by preference to one of the great centres of commerce or industry*.' Ravenstein anticipates two main findings that will be developed later: 1) distance affects the decision to migrate and normally acts as a deterrent (i.e. it represents a cost for prospective movers) and 2) the size and economic activities of cities influence in-migration.

One of the early studies on the interaction between migration and distance is by Young (1924). He employs Newton's formula of gravitation to rural migrants in New York. For the gravity law of human migration, the number of people exchanged by two regions is positively related to their relative size and negatively related to their distance.

Another contribution to the development of spatial models applied to migration is by the social psychologist Stouffer (1940). He emphasises the role of the type of space over the linear distance (p. 846), and says: '*The theory here proposed and studied empirically assumes that there is no necessary relationship between mobility and distance. Instead, it introduces the concept of intervening opportunities. It proposes that the number of persons going a given distance is directly proportional to the number of opportunities at that distance and inversely proportional to the number of intervening opportunities. Another way of stating the same hypothesis is that the number of persons going a given distance is directly proportional to the percentage increase in opportunities at that distance.*'[31]

Some years later, Zipf (1946) explores what he calls the '*P*P/D hypothesis.*' Analysing the relationship between population flow and distance among 29 US cities that were arbitrarily chosen, he finds some regularities that confirm the superiority of distance over Stouffer's intervening opportunities. In the conclusion of his paper, the author declares:

[31] In the same period the astronomer Stewart (1941, 1947) explores the link between inter-city migration and the Newton formula of gravitation; according to Stewart, flows between regions should be positively related to the mass of regions and negatively related to the distance.

'*inter-city movement…of persons between any two communities, P1 and P2, that are separated by an easiest transportation distance D, will be directly proportionate to the product of, P1 and P2, and inversely proportionate to the distance, D.*'.

1.6.1 Migration and spatial interaction models

To generalise, the base gravity models of migration belong to the so-called spatial interaction models that have been developed to forecast various types of mobility over space, such as journey to work, shopping behaviour, tourism and migration (Haynes and Fotheringham, 1984; De Vries et al., 2000), gender-specific patterns of service class migration (Boyle and Halfacree, 1995) and interprovincial migration (Shen, 1999).
As LeSage and Pace (2008) explain, the spatial interaction models of migration analyse the dynamic exchange of inhabitants between regions of origins (*i*) and regions of destinations (*j*). Following the gravity theory, the flow between cities and regions is expected to be dependent on their relative socio-economic structure and the distance (De Vries et al., 2000):

$$Mij = C_i C_J F_{ij} \tag{1.32}$$

where M_{ij} is the flow from origin *i* to destination *j*; C_i is a vector of characteristics in the region of origin *i; Cj* is a vector of characteristics in the destination *j;* and F_{ij} is the facility of movement from *i* to *j*. If F_{ij} represents distance or travel cost, the expected effect of such determinants on the outflows from *i* to *j* is negative. The base gravity model has two main drawbacks in economics: first, the lack of theoretical background on the behaviour of migrants, and second, the reductive list of determinants explaining the decision to migrate (population and distance). Therefore, economists reformulate the base gravity model giving to it a behavioural content in light of the economic theory. Such extended versions have been defined as modified gravity models. Migrants are considered rational individuals who move across space choosing the location that

maximises the difference between benefits and costs. In the modified gravity models, the length of the movement (the distance between origin and destination) enters as a further driver of the individual rational decision to move. One of the most common equations of such an extended version of gravity models is due to Lowry (1966):

$$M_{AB} = g\left[\frac{u_A}{u_B}\frac{w_B}{w_A}\frac{P_A P_B}{D_{AB}^a}\right] \tag{1.33}$$

In the formula above, the movement from region *A* to region *B* (M_{AB}) is positively correlated to the unemployment rate in region *A* (u_A) and wages in region *B* (w_B); hence, an increase in the unemployment rate in region *A*, and an increase in wages in region *B*, will generate migration flow from *A* to *B*. Conversely, the movement from *A* to *B* is negatively correlated to the rate of unemployment in *B* and to wages in *A*; therefore, an increase in the unemployment rate in *B* or an increase in wages in *A* will have a negative effect on the flows from *A* to *B* (probably increasing the flows from *B* to *A*). The letter *g* indicates the functional form. Some applications of modified gravity models use only economic variables (frequently wages or income, employment or unemployment): for instance, the work of Congdon (1988) on intracity movements between London borough (census data for 1981), or Devillanova and García-Fontes (2004) on interprovincial migration in Spain (for the time span 1978–1992). In other works, the gravity equation includes also human capital, amenities and the degree of urbanisation. For instance, Greenwood (1969) analyses interstate migration in the United States over the period 1955–1960. In his extended gravity model he includes economic determinants (income and unemployment), years of schooling and yearly temperature. A modified gravity model is also applied by Greenwood and Sweetland (1972) in exploring migration at a metropolitan level in 50 Standard Metropolitan Statistical Areas (SMSAs) in the United States over the period 1955–1960.

Further advances of the gravity models are the systemic gravity models (De Vries et al., 2000; Greenwood and Hunt, 2003,). In these models, the flows between each pair of regions depend on the characteristics of the two regions but also on the characteristics

of all other relevant destinations. This approach has been introduced by Alonso (1978[32]) and can be described formally as[33]

$$M_{ij} = v_i D_i^{\alpha_i - 1} w_j C_j^{\beta_j - 1} F_{ij} \qquad (1.34)$$

In practice, migration from *i* to *j* would depend on the population of *i* (v_i) but also on the capacity of the system to pull on *i* (D_i, or 'draw' factors). This capacity in turn depends on the relation of *i* with the system, per unit of v_i. α_i represents the elasticity of migration flows from *i* to *j* to the system pull factors on *i*; migration from *i* to *j* depends also on the population of *j* (w_j) and on C_j, which are the competition factors or repulsion factors that in turn are functions of the relations of *j* with the system, per unit of w_j; β_j is the elasticity of the flow from *i* to *j* to the repulsion factors C_j.

F_{ij} is the facility of movement from *i* to *j*. If F_{ij} is the inverse function of distance, D_i and C_j are equal, therefore, the model becomes a base gravity model. Furthermore, if v_i and w_j are a set of characteristics including economic ones, the model is a modified gravity model.

As Termote (2002, p. 174) explains, '*the whole of the spatial system*' is introduced into the analysis by means of a composite measure of '*attractions and repulsions forces that determine migration*.' An example of applying this approach is given by Mueser (1989), who analyses migration flows between US states over 3 decades from 1960 to 1989 (census data). This work is particularly interesting for its findings about the role of distance in migration: while Mueser (1989) reconfirmed its importance as deterrent factor, he also found that distance elasticity is not constant as in many gravity models. Specifically, distance elasticity is smaller for the first 250 miles, greater for 250–miles, and declining for larger distances. Furthermore, the impact of distance varies across origins and destinations and this is due to '*differences in preferences across groups, and the perceived similarities of alternative destinations*' (p. 190).

[32] For a formal analysis of the Alonso model, see De Vries et al. (2000).
[33] The explanation of the systemic model of Alonso is taken by two main works: De Vries et al. (2000) and Greenwood and Hunt (2003).

In light of some previous studies, Mueser (1989) tests the relationship between migration and distance and reaches the following conclusions:

1. The higher the degree of urbanisation of states, the higher the quantity of migrants they send and receive, and in this case distance plays a minor role;
2. States with relatively higher income tend to send migrants longer distances (to more dispersed states);
3. States with more adjacent destinations tend to have more migrants and distance plays a minor role; and
4. More accessible states tend to attract migrants from more distant areas.

Previous literature has already highlighted the effect of urbanisation on migrants from more dispersed rural areas (for a theoretical model, see Harris and Todaro, 1970; for empirical applications, see Greenwood, 1969, and Greenwood et al., 1981). The literature finds also that more central areas produce flows for which the effect of distance is less important (Greenwood and Sweetland, 1972; Haynes and Fotheringham, 1984).

Another example of an extended gravity model with a systemic approach is due to Gordon and Vickerman (1982), who apply multi-stream migrations of the London Metropolitan Region further disaggregated into 112 zones (in total, the square matrix of 112 x 112 movements).

In applied research overall, distance is considered a proxy for other types of migration deterrents such as transportation costs, but also '*the psychic costs associated with moving away from one's family and friends*' (Greenwood, 1969, p. 191[34]), and '*uncertainty, and risk aversion…*' (Juarez, 2000, p. 386).

Schwartz (1973), using the line of human capital theory à la Sjaastad (1962), estimates the effect of age and education on the distance elasticity of migration. He finds a tendency for age to increase the adverse effect of distance on the choice of a destination. Education strongly affects distance elasticity, diminishing the adverse impact of distance on the choice of the destination.

[34] The psychic cost of migration increases with distance: '*The longer the distance migrated, the lower will be the frequency of reunion; hence, the higher will be the psychic cost'* (Schwartz, 1973, p. 1160).

Finally, it is worth mentioning the role of spatial dependence on migration flows. In the first 'Law of Geography', Tobler (1970, p. 236) states, '*Everything is related to everything else, but near things are more related to each other.'* Therefore, migration streams can be spatially correlated and, as such, the quantity of migrants in a location may depend on the quantity of migrants in contiguous areas; if this is the case, a problem of spatial autocorrelation arises. According to LaSage and Pace (2008), the omission of controlling for possible spatial dependence will produce biased and inconsistent estimates. For this reason, the authors propose a further extension of gravity models: the spatial regression gravity model. This model is not well developed in migration literature but an application is provided by LaSage and Pace (2008) on US state-to-state flows for the time span 1995–2000.

In a recent literature review on migration modelling, Cushing and Poot (2004, p. 325) highlight that '*despite the strong theoretical basis for considering spatial structure and the innumerable empirical studies demonstrating its importance, a significant portion of empirical research continues to omit any aspect of space*.'

1.6.2 Migration in new economic geography models

Despite the already ample work of geographers and of scholars in regional economics, mainstream economics has started to recognise the role of distance, agglomeration economies and economies of scale since the seminal work of the Nobel Prize economist Paul R. Krugman (1991) and the development of new economic geography (NEG). From an empirical point of view, NEG models are very similar to gravity models; the difference is that the former are supported by economic theory. The main assumption is that individual welfare depends on the variety of goods consumed locally (McCann, 2013). Krugman (1991) considers spatial agglomeration as a cumulative process à la Hirschman (1958) based on two main centripetal forces (Crozet, 2004; McCann, 2013): first, 'backward' linkage, or demand externalities that affect the location choice of firms. In the presence of economies of scale and transport costs, firms prefer

to locate in regions with good access to markets and demand. Second, 'forward' linkage, or cost externalities that affect the location of workers. Because of their preference for variety, workers prefer to locate in large manufacturing regions as lower transportation costs allow them to consume a larger variety of goods at lower cost (i.e. they can enjoy a better quality of life with a lower cost of living). The preferences of individuals and firms for central markets foster agglomeration and agglomeration fosters productivity. Therefore, in core regions, the price index of manufactured goods is lower because the majority of goods are produced locally, while in remote regions, it is higher because the majority of goods are imported from distant locations. Holding constant nominal wages, real wages are higher in core regions and lower in peripheral ones; specifically, core regions are more attractive because of the larger variety of goods available at lower prices. Therefore, the price index of manufactured goods is negatively related to the market potential.

Hence, transport costs and consumer preferences for variety trigger core–periphery type of development in which firms and capital generally choose larger regions. If transport costs were very low or zero, the advantage of agglomeration would almost disappear (McCann, 2013).

The application of the NEG framework to the analysis of migration flows is rather recent, with the priority of such studies being to investigate the existence of the forward linkage (Crozet, 2004, analyses European Countries and Pon et al., 2007, investigates the case of Spain) or to predict the distribution of labour in specific regions or countries (both Kancs, 2010, and Kancs and Kietyle, 2011, analyse and predict migration in the enlarged European Union after integration). In the empirical models (Crozet, 2004; Paluzie et al., 2007), the share of migrants moving toward a given region depends negatively on its distance from the origin (a proxy for transport costs and other types of costs such as psychic costs à la Sjaastad, 1962). The share of migrants moving toward a given region depends positively on the employment probability supplied by the region (à la Harris and Todaro, 1970), the expected nominal wages and finally, on the market potential of the region, which is measured by the price index of a variety of traded

manufactured goods. The latter is used as an indicator of market potential and is expected to be the stronger migration driver validating the impact of the forward linkage. The main limitation of such models is that they consider only economic drivers of migration, and completely neglect other types of push and pull factors.

1.7 Conclusions

This chapter reviews the different approaches to the analysis of internal migration with specific focus on equilibrium and disequilibrium theories of migration, and the role of distance in migration models. The theory predicts that younger and better-educated individuals tend to have a greater migratory attitude in order to obtain the highest return on investment in their education and skills acquisition (Sjaastad, 1962) or to have opportunities to achieve better social status (Fielding). In so doing, however, they follow disequilibrium arguments. Furthermore, as Glaeser and Gottlieb (1998) and Florida (2002) highlight, the better and more productive individuals – *ceteris paribus* – —tend to choose places with higher urban amenities. According to both Sjaastad and search models, individuals with high human capital would tend to move greater distances than those with low human capital. As will be explained in Chapter 2, the attitude toward migration might be affected also by some other individual- or place-related characteristics, such as type of social and family capital. In cultures where the attachment to families or places is stronger, individuals are relatively more attached to their region of origin. Next, Chapter 2 analyses the empirical findings of studies focused on the drivers of migration with specific focus on economic opportunities and amenities. In this context, the results of recent research in the United States and Europe are discussed, alongside the relationship between migration and social and family capital. The second part of Chapter 2 is devoted to the main questions of the present work in light of the findings of the empirical literature and to illustrate why the case of Italy is suitable for the purpose of the analysis.

CHAPTER 2

INTERREGIONAL MIGRATION FLOWS: JOBS OR AMENITIES? THE KEY QUESTIONS

2.1 Introduction

Chapter 1 was devoted to definitions, conceptualisation and theoretical models of internal migration with a deeper discussion of regional and urban economics models and other types, such as gravity and spatial models. As will be clear in Chapter 2, the interactions between equilibrium and disequilibrium drivers and distance migrated are central to our study.

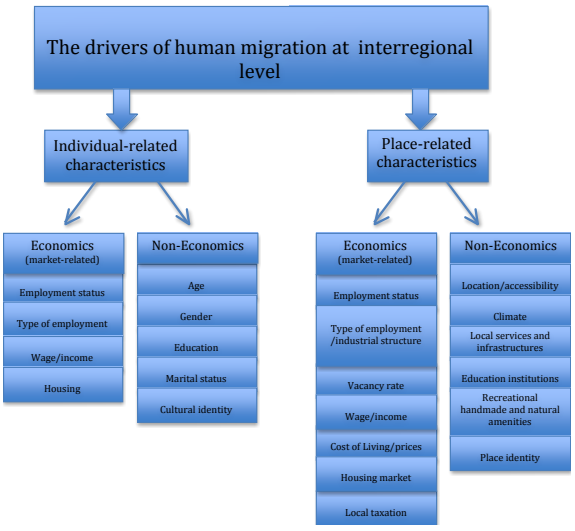
Chapter 2 is divided into 3 main parts. Section 2.2 examines the findings of the empirical research regarding the effects of different migration drivers. In Subsections 2.2.1 and 2.2.2, particular attention is paid to the role of economic variables and amenities; Subsection 2.2.3 is dedicated to social and family capital variables whose role in migration decisions is under-explored; and Subsection 2.2.4 explores the empirical evidence for equilibrium and disequilibrium migration in the United States and Europe.

In Section 2.3, the second main part of Chapter 2, and Subsection 2.3.1, we illustrate the research questions and the contributions of our study; while the implications for regional policies are illustrated in Subsection 2.3.2. The third main part of Chapter 2 is outlined in Section 2.4 and explains why the empirical application to the case of Italy is suitable for the present study. Some conclusions are outlined in Section 2.5.

2.2 The main drivers of interregional migration: Key findings from empirical research

As highlighted in Chapter 1, one of the most important questions in the literature is whether interregional migration acts as an equilibrating mechanism. Central to this question is the efficiency of labour markets in terms of matching workers with jobs, and the response of labour migration to changes in economic and non-economic variables. Labour flows are essential to improve market efficiency. This section analyses the empirical findings of the literature regarding two main interconnected matters: 1) the drivers of interregional migration and 2) the empirical results of equilibrium or disequilibrium models. A possible classification between migration drivers is shown in Figure 2.1, in which the variables are distinguished as either individual-related or place-related; each category has been further classified into economic (or market-related) and non-economic drivers. Migration by type of employment is strictly linked to the educational selectivity of migration (Van Dijk et al., 1989; Clark and Cosgrove, 1991) and 'age selectivity of migration' (Greenwood, 1969; Van Dijk et al., 1989; Plane, 1993). As in the Sjaastad (1962) model, recent empirical research confirms that younger and more educated people are more likely to move (Kennan and Walker, 2011).

Figure 2.1 Drivers of migration at interregional level



Source: Author's own elaboration.

Even though the figure is comprehensive for all possible drivers of migration, this study focuses mainly on economic drivers such as unemployment, income or relative wages. The non-economic variables of interest for this work are essentially quality of life variables such as amenities and social and family capital variables that are included in the broader categories of cultural identity and place identity. Therefore, the following Subsection analyses these drivers more in depth.

2.2.1 Economic variables

In regional analysis, differentials in unemployment have received the greatest attention. The most influential applied studies that focus on the relationship between unemployment and migration at a microeconomic level are due to Da Vanzo (1978) and Schlottmann and Herzog (1981) for the case of the United States; Hughes and McCormick (1985, 1987), Mohlo (1987), and Pissarides and Wadsworth (1989) for the case of the United Kingdom; and Van Dijk et al. (1989) for a comparison between the Netherlands and US labour markets. These studies model out-migration and neglect the effect of the economic variables in the destinations. Overall, the literature finds that individual and area unemployment might have different effects on out-migration. Specifically, both in Europe and the United States, unemployed individuals are more likely to migrate that employed ones[35]. Pissarides and Wadsworth (1989, p. 43) notice that when '*all economic effects are combined, there is evidence that there is a statistically significant flow in the "right" direction: gross outflows from high unemployment, …and low wage regions are higher than gross outflows from other regions.*' However, the authors noticed that in the case of the United Kingdom during 1976–1977 and 1983–1984 when the overall unemployment rate was high, the probability of migrating decreases, that is, '*the response to economic incentive is reduced in high unemployment years*' (p. 43). Hughes and McCormick (1985), analysing

[35] Furthermore, Van Dijk et al. (1989) observe that in the Netherlands where there are efficient labour market institutions the effect of personal unemployment on the decision to migrate is even higher.

the case of the United Kingdom, attribute this perverse result to the linkage between unemployment and house tenure. More specifically, in the presence of an active council house system as in the United Kingdom, the probability of migrating is lower for council tenants compared to other tenants or owner–occupiers. Van Dijk et al. (1989) highlight that the unemployment rate can be considered an indicator of labour market tightness; therefore, a higher rate of unemployment might either encourage or discourage out-migration. In the latter case, a high unemployment rate in the place of origin dampens the movement if the prospective mover believes he will remain unemployed in the destination. The authors find that in the United States, a higher unemployment rate increases out-migration (i.e. the sign of the coefficient of the unemployment rate is positive), while the opposite occurs in the Netherlands (the sign is negative). This difference has been attributed to the role of labour market institutions in the two countries. The more efficient institutional system (and subsidies programmes) of the Netherlands encourages contracted migration and less risky behaviour with respect to the United States where migrants adopt more risky decisions and the movements are mostly speculative.

This perverse relationship between migration and the average area's unemployment rate has been noticed also in empirical applications of macroeconomic data. As cited before, Jackman and Savoury (1992) propose a hiring function (see Subsection 1.5.2) that explains how '*migration can be useful regarded as a special case of hiring, with overall engagements in the labour market the dominant factor explaining aggregate migration*' (p. 1438). Therefore, interregional migration reduces in periods of recession[36] while unemployment differences increase due to the overall decrease of the total engagements: reduced recruitments decrease job opportunities and, consequently, interregional migration. Hence, for Jackman and Savoury (1992) the empirical applications should control for unemployment rate, vacancy rate and aggregate level of hiring. Unfortunately, the last two variables are often not included in the empirical applications due to their unavailability as empirical data. However, including them would

[36] This approach considers migration as a result of successful job search rather than a pre-condition for it (so-called contracted migration versus speculative migration).

enable accounting for frictions in the labour markets. As Westerlund (1997, p. 56) well explains, *'a given level of unemployment in regional labour market is not likely to produce the same effect on migratory behaviour in situations where there are ten unemployed for every vacant job as in situations where the number of vacancies equals the number of employed.*' In such cases, many empirical applications use employment growth as a proxy for the vacancy rate.

Faini et al. (1997) confirm that the impact of regional unemployment on mobility is non-linear also for the case of Italy. Specifically they find that only long distance migration responds to regional unemployment. Juarez (2000) analyses interregional migration in Spain and finds that as the unemployment rate exceeds a specific threshold, the effects of the area's unemployment on migration is reduced. More recently, Furceri (2006), studying net immigration in Italy in 1985–2001, finds that regional income differences are the main drivers of migration with no effect from unemployment rate differences. As anticipated before, other economic variables such as relative income or wages give somewhat mixed results. Many studies find that when income/wages and unemployment rate are included in the same empirical model, one of the two becomes insignificant. Westerlund (1997), for instance, highlights that this is the case mainly for the difference in earnings.

Confirmation of the role of economic variables (per capita gross domestic product and unemployment rate) are given recently by Etzo (2011), who uses a gravity model applied to Italian regions for the time span 1996–2002. He finds that economic variables are the key drivers of migration in Italy. The same conclusion is reached by Faggian and McCann (2009a, b) for the United Kingdom, by Alecke et al. (1999) for Germany and by Cheshire and Magrini (2006) for Europe.

2.2.2 Amenities

Since the 1980s, migration studies in urban and regional economics and quality of life literature have started including in the empirical models pure amenities such as weather

or proximity to natural amenities (Graves, 1980; Blomquist et al., 1988). Currently, these two variables are still the main ones used in the empirical applications for their distinctive ability to be perfectly exogenous with respect to migration flows. As recent examples, it is worthwhile to cite the work of Partridge et al. (2012) on interregional migration in the United States and Cheshire and Magrini (2006) and Rodriguez-Pose and Ketterer (2012) on interregional migration in Europe.

Disamenities such as crime (Roback, 1982) and pollution (Blomquist et al., 1988) are also included in many applications. However, the characteristics of these two types of disamenities are somewhat different to pure amenities since they might have some degree of endogeneity: that is, crime and pollution might depend on the population, hence on the number of migrants in a specific location.

As Graves (1983, p. 541) highlights, including amenities in interregional migration models is not without drawbacks, as '*there is virtually no limit to the number of amenities which may enter preference functions. Moreover, many amenities are correlated (as, for example, presence of an ocean and moderated temperatures or mountains and low humidity), and one is forced to choose between imprecise estimates of amenity impacts and omitted variables bias.*'

Following the urban economics literature, Graves (1983) suggests using rents in the equation to substitute for amenities variables. In considering amenities in the decision choices of migrants and by introducing housing markets into the picture, the literature on interregional migration follows that of urban economics literature, for which the implicit prices of location-specific goods are embodied in housing rents and wages. However, very frequently rent or house prices are unavailable as empirical data.

Building on Graves' initial intuition, other analysts started to consider other human-produced amenities including public services (Blomquist et al., 1988; Gyourko and Tracey, 1991) and social, cultural and skills-dependent amenities such as movie theatres, bars, museums, art galleries, restaurants and trendy shops (Glaeser et al., 2001; Florida, 2002; Boshma and Fritsch, 2009), which appear to be particularly important in an urban context (Shapiro, 2006). The presence of the latter type of urban amenities along with tolerant and open-minded inhabitants of cities is important to

attract the so-called creative class which consists of talented and creative people (Florida, 2002b). According to Florida (2002a, b), these types of individuals are associated with economic growth (we will turn to this specific issue in Subsection 2.3.2).

2.2.3 Social and family capital variables

According to institutional economics, institutions play a big role in shaping economic performance. Social and family capital is considered among them. As is well known, the concept of social capital was pointed out firstly by political scientists (Banfield, 1958; Putnam, 1993; Fukuyama, 1997) and sociologists (Bourdieu, 1985; Coleman, 1988,; Portes, 1998)[37]. Recently, the investigation of the role of social capital in economic performance at a micro and macro level has been included in the research agenda of economists who largely use the same definition of social capital developed by Putnam (1993).

For Coleman, social capital (SC from now on) is present in social organisations that facilitate people belonging to them to achieve goals that would otherwise be very difficult to achieve. Putnam (1993) includes the roles of trust, norms and network as the means by which social organisations work, and these roles are emphasised by Putnam at a later stage (2000, p. 19), in which he defines SC as '…*connections among individuals' social networks and norms of reciprocity and trustworthiness that arise from them.*' Both, the sociological and the political visions stress the role of 'ties' of individuals within a specific community. Nevertheless, while sociologists stress SC arising from small groups and families, political scientists focus on that SC arising from the larger community and even nations. Overall, ties and interactions are considered base resources for individual and community performance and are seen as individual or community assets (Portes, 2000). In both cases, SC is considered productive; it is an intangible asset producing tangible results.

[37] Actually, the economist Loury (1977) analyses social capital as one of the main attributes contributing to the accumulation of human capital.

The presence of ties is positive unless '*the sharing of values and norms does not itself produce social capital, because the values may be the wrong ones…'* (Fukuyama, 1997, p. 378). In the same vein, Helliwell (2001) refers to the Mafia, the Ku Klux Klan, the Nazi Youth and bomb plotters as examples of ties producing bad overall effects.

In the empirical research, there are two main indicators used to test the presence or intensity of the stock of social capital in a society: measuring interpersonal trust directly through questionnaires (Knack and Keefer, 1997; Glaeser et al., 2000; Helliwell and Huang, 2005) and measuring participation in associations (including sports), electoral turnout, newspaper readership and general measures of civic sense such as not littering and giving to charity (Putnam, 1993).

Putnam (1993) considers civic virtues as the central attribute of communities with high SC. Citizens with civic virtues participate in political life both directly through their vote and indirectly once the political decisions have been made, by respecting the law, cooperating in associations and behaving ethically for the public good. Helliwell and Putnam (1995,1999) find a strong link between civic community, institutional performance and civic satisfaction. Applied researchers find that some measures of social capital and quality of government have large positive effects on subjective wellbeing (Helliwell, 2005). This is particularly true at a microeconomic level: Helliwell and Huang (2005) find that non-economic job characteristics (mainly trust and quality of the workplace) increase the subjective wellbeing of workers and life satisfaction.

As far as the impact on economic growth is concerned, as Arrighetti et al. (2001) well explain, SC seems to have a positive effect on enhancing growth. At a microeconomic level, it improves the efficiency of the markets through reductions in transaction costs and the imposition of social sanctions where the contract is not respected; at a macroeconomic level, it increases the quality and quantity of public goods, improves the efficiency of institutions, develops the efficacy of regulations, and therefore, the certainty of the system.

While much research studies the effects of SC and how it can be persistent over time[38], little work has been dedicated to the role of family capital.

Regarding the child–parent relationship, Coleman (1988, p. 110) points out that SC inside the family is defined as the '*time and effort spent by the father with the child on intellectual …development*.' Of course, human capital of parents affects that of children, '*but this human capital may be irrelevant to outcomes for children if parents are not an important part of their children's lives, if their human capital is employed exclusively at work or elsewhere outside the home*.' Therefore, the physical presence of parents and the attention they give to children would make a difference to future performance. To detect low SC inside the family, Coleman uses the drop-out rate from secondary schools: the higher the rate, the lower the SC inside the family. Another indicator is the parent/child ratio: the higher the ratio, the lower the SC of the family (due to less time spent with each child). Another important link highlighted by Putnam (1996) is the positive connection between education and SC. Better-educated families are likely to participate more and trust more than less educated ones.

In his famous paper, the sociologist Granovetter (1973, p. 1361) defines the strength of ties as '…*(probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services, which characterize the tie'* He defines 'strong' ties as those arising inside the family or groups of close friends and 'weak' ties as those arising with acquaintances. Granovetter (1973, 2005) theoretically demonstrates that a bigger exchange of information occurs between people bounded with weak ties, the reason being that '*…close friends tend to move in the same circles that we do, the information they receive overlaps considerably with what we already know…'* (2005, p. 34). On the contrary, acquaintances may exchange different and new information.

Whiteley (2002), in his attempt to explain the relationship between economic growth and SC, names the same categories 'thin' and 'thick' trust. He considers generalised trust as a positive externality arising from family trust. Of course, a positive externality is not the

[38] For a comprehensive look at the role of institutions and specifically at SC, see http://www.socialcapitalgateway.org/publications/papers.

only possible outcome. As Fukuyama (1995) finds in analysing Chinese families, the stronger the trust within families, the lower the societal trust. Hence, the correlation between family and community ties is not necessarily positive. As Whiteley (2000) explains, there are possibilities that certain type of societies might display thick trust without any external positive effects, and this is true particularly for societies characterised by ethnic or racial divisions.

Alesina and Giuliano (2007, 2010), using the time periods 1995–97 and 1999–2000 from the World Values Survey (WWS)[39], analyse the connections between strong families ties and economic performance of 78 countries worldwide, which differ in income level, religion, and geography. The researchers find that societies in which family ties are very strong, individuals rely less on the market and more on the family as a provider of goods and services. Where strong family ties predominate, families are larger, tend to produce more at home, and the labour force participation of women and youngsters is lower.

Duranton et al. (2009), studying regional disparities in Europe, find a potential link between family types and economic performance. Specifically, they find that the persistence in some European regions of family types inherited from the Middle Age era have affected the actual regional differences in household size, educational level, labour force participation, social capital, economic performance, inequality, and so on. Using Todd's (1990) classification of families, they identify two main extremes: 'stem' or 'authoritarian' families; and 'nuclear' or 'liberal' families. They find that the former are associated with large family size, low level of education, low participation in the labour force, mainly industrial-oriented economies and poorer and less dynamic regions (p. 43), while the latter are associated with smaller family size, higher education, higher participation in the labour force, higher amount of club membership, mainly services-oriented economies and richer and more dynamic regions (p. 42). In the middle of these two extremes, mixed family types are considered. The researchers conclude by highlighting that the '*link between family structure and socio-economic outcomes*

[39] World Value Survey is worldwide survey on cultural attitude and values of people living in different countries. For more information about the survey see http://www.worldvaluessurvey.org/

deserves attention and may offer significant progress toward understanding why some regions are richer, have different levels of social capital, are more able to adapt to sectoral shifts, or are more unequal than others' (p. 45).

2.2.3.1 Social and family capital and migration

In some countries, individuals tend to live close to their original family, and such behaviour may affect attitudes toward migration. Whether family ties are positive or negative for migration is a matter that researchers should investigate.

Alesina and Giuliano (2007, 2010), studying 78 countries worldwide, find that geographical mobility is lower where family ties are stronger.

Belot and Ermisch (2009) find that proximity of friends negatively affects migration decisions in the United Kingdom. In the case of the United States, Spilimbergo and Ubeda (2004) highlight that black US workers tend to be less mobile than white US workers because of family ties. David et al. (2008) find that low mobility of European labour markets (mainly in southern Europe) can be explained by what they call 'local social capital', a sort of attachment by Europeans to their country of origin, and for them this attachment is one of the main causes of immobility. Home ownership can play a role as well: studies demonstrate that home ownership is correlated positively with the presence of SC (Winter, 2000). Glaeser et al. (2002) find that homeowners are relative less mobile and normally live in places with higher SC. Moreover, social or family ties might be a further information channel to boost migration in destinations by increasing the amount of information and decreasing the cost of migration. As seen in Chapter 1, this is called chain migration (McDonald and MacDonald, 1964) or beaten path (Hoover, 1971). For instance Rainer and Siedler (2012, p. 3) find that the existence of family and relatives in West Germany is a predictor of '*migration hazard rate of East Germans'*.

2.2.4 Evidence for equilibrium and disequilibrium in Europe and the United States

The latest US evidence suggests that non-economic factors such as natural amenities (Partridge and Rickman, 2003, 2006; Partridge, 2010) are key drivers of interregional migration and that the growth of cities is also very dependent on the migration induced by spatial sorting of skills and the interactions between these skills and consumption of urban amenities (Glaeser et al., 2001; Adamson et al., 2004; Shapiro, 2006).

Recent empirical evidence in favour of the spatial equilibrium hypothesis in the United States is provided by, among others, Glaeser and Gottlieb (2008), Winters (2009) and Partridge et al. (2012). The spatial equilibrium model implies that high wages are offset by high housing prices (a high cost of living) and low amenities, and that individuals are very mobile across the territory (there are no barriers to migration). Glaeser and Gottlieb (2008), seeking empirical evidence for equilibrium in the United States, consider high mobility as the first evidence for the equilibrium model: about 45% of Americans migrated internally between 1995 and 2000. The second set of evidence for equilibrium comes from analysing the standard deviation of wages across metropolitan areas before and after controlling for years of schooling as an indicator of human capital; they find that differences in human capital explain about half of the variance in the areas' wage levels. However, they find that even when controlling for human capital characteristics the wage differences persist; therefore, if spatial equilibrium works properly, such differences should be offset by high cost of living and low amenities. Further evidence in favour of equilibrium includes the high positive correlation between income per capita and house prices across metropolitan areas in the United States (70%); the high positive correlation between the logarithm of the price index and the logarithm of income per capita (54%); and the negative correlation, even though not very high, between the weather (measured mean January temperature) and real wages. They conclude that people do not flow toward richer areas as expected by disequilibrium and highlight the weak convergence of income across cities.

Winters (2009) analyses the relationship between wages and prices to see whether US workers are fully compensated for cost of living differences. Using microeconomic data on earnings and individual characteristics from the 2006 US Current Population Survey: Outgoing Rotation Groups, he empirically tests a wage equation in which hourly wages are regressed on a set of individual characteristics, the general price level, and amenities of different US areas. The coefficient of the log of the price index is interpreted as the wage–price elasticity. Additionally, following quality of life literature (Roback, 1982, and more recently Shapiro, 2006), the general price level in each city is further divided into housing prices, and non-housing prices. The latter variable has been instrumented in avoiding measurement errors. Winters finds that the elasticity between wages and the general price levels across cities is equal to one when data on rents is used instead of housing prices. For the author this outcome can be considered one piece of evidence in favour of spatial equilibrium in the United States: when the coefficient of the price level is equal or close to one, it means that workers are fully compensated for differences in prices across cities.

Partridge et al. (2012), studying internal migration in the United States from 2000–2008, find a persistent slowdown in gross and net migration that can be interpreted as signals of spatial equilibrium. The authors highlight the need for further research on this topic.

Ferguson et al. (2007), analysing population change for 2,400 Canadian communities, conclude that amenities prevail for youth, young adults and elderly cohorts.

In Europe, the situation seems rather different. It is well known that European countries generally exhibit much lower levels of interregional migration than the United States: empirical research in Europe shows that people tend to be rather immobile. Net migration between similarly sized geographical regions in the United States is 15 times greater than in Europe (Cheshire and Magrini, 2006).

However, the differences are not simply in terms of degree of mobility. The vast majority of evidence from Europe suggests that interregional migration is driven primarily by a disequilibrium mechanism in which, allowing for life-cycle effects (Fielding, 1993; Plane and Heins, 2003), migration is mainly a response, albeit a slow one, to spatial

differences in economic factors such as wages and employment opportunities (Faggian and McCann, 2009a).

In Europe, natural amenities, such as climate, do not affect migration to the extent found in the United States. Cheshire and Magrini (2006) investigate this specific question for a cross-section of 121 large city regions, or Functional Urban Regions (FURs), in the European Union (specifically, the EU12). Because of limited availability of migration data, they use as an endogenous variable, the population growth rate between 1980 and 2000 in each of the FURs. Regressing economic and climate variables (cloud, minimum temperature, mean temperature, maximum temperature and wet days) on population growth, they find that when natural amenities variables are included in the model, the results are totally non-significant, while the effect of economic opportunities is positive and significant. However, looking at population growth within EU countries, the impact of climate is positive and stronger than economic opportunities. For Cheshire and Magrini (2006), these results indicate that in EU countries natural amenities matter but only for migration within countries (conversely, Alecke et al., 1999, and Etzo, 2011, confirm the role of economic variables for Germany and Italy, respectively). Boschma and Fritsch (2009), analysing the main drivers of the creative class in Denmark, England and Wales, Finland, Germany, The Netherlands, Norway and Sweden (a dataset of more than 500 regions), find that job opportunities are more important than tolerance and openness, as well as cultural and recreational amenities. Hansen and Niedomysl (2008), studying interregional migration of the creative class in Sweden, conclude that people climate (i.e. openness and tolerance) has not as strong an impact on migration as predicted by Florida (2002) theory.

In a very recent paper, Rodriguez-Pose and Ketterer (2012) find very interesting results. The main purpose of the analysis is to investigate which among economic, socio-demographic, and amenities variables prevail in driving interregional migration for 133 European regions (in the EU12) over the period 1990–2006. They use a combination of NUTS1 and NUTS2 data instead of the FURs used by Cheshire and Magrini (2006). According to Rodriguez-Pose and Ketterer, (2012, p. 536) using administrative data on regions as a whole allows them '*to capture the impact of different (non-urban) land*

cover variables on migrants' place-based utility and hence provide an opportunity to study not only the amenity-related pull of city–regions, but also that of more peripheral (or rural areas). Furthermore, besides economic and climatic variables they consider also a very large set of variables including social externalities and many place-based regional variables such as amenities (natural and physical landscape characteristics) and cultural, historical or identity-type variables (aesthetic, recreational, cultural and artistic landscapes). Unlike Cheshire and Magrini (2006), they find that natural amenities significantly affect the relative attractiveness of sub-national territories across the European Union. Consequently, they conclude that even Europe may be much more similar to place-based preferences like the United States.

Analysing the contrasting results of recent studies, can we definitively say that the debate is over? It seems quite clear that, first, the empirical evidence offers somewhat mixed results; second, the solution might not be a simple 'either/or' and is probably more complex; third, more research is needed on this topic.

2.3 Research questions and the contribution of the present study

Based on the US findings, many scholars are convinced that individual utilities mainly arise from the consumption of amenities, at least in North America. From this point of view, the lack of widespread evidence for the European case is explained by frictions to proper compensation caused by the greater institutional, cultural, historical and linguistic variations across Europe. Scholars who are proponents of disequilibrium would answer that evidence for the relatively lower effect of disequilibrium drivers in the United States, or elsewhere, most probably results from data limitations such as miscalculations of real wages (income or other economic variables), omission of important economic variables (Jackman and Savoury's argument), or the necessity to control for the probability of finding a job (Harris and Todaro's argument).

After reviewing the recent empirical evidence on the United States and Europe, three main questions arise:

a. Can we definitively say that the equilibrium versus disequilibrium debate is over?

b. Could alternative explanations reconcile the equilibrium and disequilibrium theories of migration?

c. Why is the job versus amenities question still so important and what are the implications for regional policies?

Subsection 2.3.1 discusses the first two questions, while Subsection 2.3.2 discusses the last.

As anticipated previously, the purpose of this study is to investigate alternative explanations capable of reconciling the equilibrium and disequilibrium theories of migration, to demonstrate why the job versus amenities question matters and to assess the implications for regional policies. Precisely, the present work explores whether distance can be seen as an intervening factor that, under certain circumstances (specifically, sticky people with strong territorial identity/attachment and family ties), might change the effect of different types of drivers in the decision to migrate.

2.3.1 Equilibrium versus disequilibrium: Is the debate definitively over, and can alternative explanations reconcile the two theories?

As seen previously, the debate is probably less evident today but the question of which theory holds sway remains unsolved; studies on interregional migration are still divided into 1) papers quoting equilibrium literature à la Graves; 2) papers quoting disequilibrium literature à la Greenwood and 3) papers quoting both without entering into the problems and implications of each type of theory. Additionally, the empirical evidence is controversial (see Subsection 2.2.4) indicating that the question of whether equilibrium over disequilibrium drivers prevails in developed countries is far from being settled. However, it is likely that both types of drivers can play a role for people in diverse circumstances within countries and in different countries.

This study takes the point of view that the evidence from different countries seems to suggest the importance of different type of drivers is very much related to individual preferences that, in turn, are affected by individual characteristics (education, age,

gender and marital status) as well as cultural or social characteristics that are place- or country-specific. The role of cultural attitude toward migration for homogenous individuals living in different contexts is rather under-studied and probably underestimated. Indeed, in many cases, it would not be enough to control for the type of household, age and life cycle characteristics, education and gender of individuals. It could be that individuals in different places – *ceteris paribus* their economic situation, education, gender or age – may have different attitudes towards migration. This could be due to different territorial and family attachment; there are more likely to be sticky and immobile individuals where family ties are strong and social capital is low.

An important variable to control is, therefore, the level of social capital and family capital, or better, the ties or linkages with relatives and friends at the places of origin and destination. In some countries (mainly the Mediterranean ones but even others in the EU) such factors can play an important role in shaping the attitude toward migration. Apart from the already mentioned beaten path or chain migration (see Chapter 1), the relationship between migration and social/family capital is still under-explored.

To put together the pieces of the puzzle, it is important to include the role of distance. As seen in Chapter 1, the majority of models in regional economics do not include distance among the explanatory variables as if space is homogeneous and movement free of costs. Some exceptions to this are 1) spatial interaction and gravity models, 2) spatial econometric models, and 3) new economic geography (NEG) models. The latter are very recent. In spatial interaction models (and also in NEG models) distance is always considered a proxy for transport and psychic costs; therefore, in the empirical analysis distance is expected to show a negative sign (i.e. the longer the distance, the higher the costs of moving, and the lower the probability of migrating). Furthermore, in such models, migration flows are analysed all together as if they were a single migration phenomenon; therefore, for instance, short or long distances are inferred as the same type of movement and the only difference between them is that the latter are more costly. Moreover, distance of migration might be strongly interconnected to territorial identities and family ties and to the relative impact of equilibrium and disequilibrium variables in migration behaviour. The present work explores whether distance can be

seen as an intervening factor that, under certain circumstances (specifically, sticky people due to strong territorial identity and family ties), might change the effect of different types of drivers in the decision to migrate. In other words, we believe that in countries where people are sticky (specifically those with particularly strong territorial attachment or family ties), it is likely that they migrate long distances mostly to gain economic improvements, that is they consider the possibility of living far away from their regions of origins only in cases of strong economic returns.

For such types of individuals, quality of life depends on the amount of interaction with family and friends. In such cases, economic variables are expected to play a stronger role in explaining long distance migration; and the same types of individuals are expected to move short distances to improve overall quality of life in terms of other types of amenities such as better schools, public services and natural amenities. Short distance migration that still allows for strong and frequent contact with family and friends living in the origin region is not expected to be motivated mainly by the search for better jobs, but for improvements in amenities. In this case, amenities are expected to be empirically stronger in pushing migration than economic variables.

Empirical research in Europe shows that people tend to be rather immobile. Net migration between similarly sized geographic regions in the United States is 15 times greater than in Europe (Cheshire and Magrini, 2006). The overall hypothesis is, therefore, that for sticky people distance interacts with migration drivers. This study explores this hypothesis specifically for the case of Italy, supposing that long distance migration in the country is driven by the pursuit of economic returns (disequilibrium factors), while short distance migration is motivated by quality of life improvements related to amenities and/or services (equilibrium factors). The approach taken is to decompose labour mobility flows into short and long distance migration and to investigate the effect of economic variables, social and family capital, amenities and quality of life variables on the mobility behaviour. In order to exclude commuting patterns, a threshold of 70 km has been defined; therefore, short distance movements are defined as interprovincial movements greater than 70 km. Long distance movements are defined as migration towards non-adjacent regions.

2.3.2 The importance of the job versus amenities question: Implications for regional policies

Despite the large amount of theoretical and empirical work on regional growth and development, specifically regarding the role of agglomeration economies, institutions and social capital, and endogenous growth, policy implementation has progressed at the same pace (Barca et al., 2012). Debate among urban and regional scholars currently centres on three main concerns about policy interventions for regional development: 1) whether regional economic welfare can be enhanced by specific local policies (Glaeser and Gottlieb, 2008); 2) whether it is better to implement place-based or place-neutral policies (Barca et al., 2012); and 3) regarding place-based policies, whether it is better to attract firms or migrants first (the so-called 'chicken-egg' question; Partridge and Rickman, 2003).

Urban economists who are proponents of spatial equilibrium are convinced that utilities of homogeneous individuals are equalised across space; therefore, any policy to improve regional income of disadvantaged regions will attract migrants and will trigger the rise of housing prices. Furthermore, any exogenous change in income will be restored (and compensated) quickly by means of migration. Migration is seen as reacting very fast to exogenous changes. As such, any policy aimed at improving income and welfare in poor places will probably be unsuccessful: an increase in income in the city-region will pull migrants from other regions, and the consequent increase in housing prices will reduce the welfare of the previous residents. For equilibrium theorists, place-based policies are needed only when frictions hamper migration or proper compensation.

For scholars who are proponents of disequilibrium, adjustments take a very long time anyway; furthermore, the presence of frictions make policies essential to increase individual utilities and to encourage local growth. We will turn to equilibrium versus disequilibrium place-based policies later in this subsection.

Leaving the neo-classical type of framework, for NEG models the main consumption and production advantages are associated with large cities (core regions), and are due

to agglomeration externalities; the possibility of enjoying those externalities will attract both firms and people, causing cumulative growth. Therefore, any attempt to reduce disparities with policies that subsidise regions experiencing low agglomeration economies will reduce the cumulative growth process and consequently economic welfare. For new economic geographers, perhaps the only feasible policy is one that encourages agglomeration economies and discourages agglomeration diseconomies in large cities (Glaeser and Gotlieb, 2008).

Looking specifically at the type of policies, recent literature refers to two main approaches: space-neutral and place-based (Barca et al., 2012). Place-neutral policies are space-neutral interventions in the sense that they do not depend on the social, institutional and cultural context of application; for this approach, the context does not matter in affecting the effectiveness of the policy. For instance, policy interventions facilitating agglomeration externalities and density are, independently of the type of regions, seen as, '*the most effective way of generating efficiency, guaranteeing equal opportunities, and improving the lives of individuals wherever they live and work*' (Barca et al. 2012, p. 138).

Conversely, for place-based policies the spatial or geographical context of application does affect the effectiveness of applied policy: '*space matters and shapes the potentials for development not only of territories, but, through externalities, of individuals who live in them*' (Barca et al. 2013, p. 139). It is like saying that the effectiveness of local policies depends on the context, including the institutional context, because each context has its own specific path dependency; consequently, there is no first best solution applicable to all situations. Therefore, place-based interventions are suitable in cases where development policies are offset by a poor institutional environment.

Another area for debate among mainly urban and regional economists refers to the specific targets of place-based policies and whether '*people follow newly created jobs into regions, or whether jobs follow newly arrived migrants*' (Partridge and Rickman, 2003, p. 76). In equilibrium theory, but also in the creative approach, jobs follow people; in disequilibrium theory, people follow jobs. In the human capital approach à la Glaeser (Glaeser et al., 2001), people follow both jobs and amenities. This question is not trivial

as the answer has immense implications for regional policy. If people follow jobs, regional and local policies should target firms; conversely, if jobs follow people, regional and local policies should target individuals. Regional policies have higher direct costs and need time to be implemented; therefore, any mistake in the target not only makes the policy ineffective but has also a very high opportunity cost. As is well known, the debate is still not settled (see Partridge and Rickman, 2003, for a literature review).

This work investigates the hypothesis that in certain circumstances people follow jobs while in others people follows amenities. If this is so, place-based policy should have different targets. Looking exclusively at the internal relocation of individuals, we believe that if the hypothesis of long and short distance migration is confirmed by the empirical applications, at least in Italy, then policies attracting firms would internally pull mainly long distance interregional movements, and then not many because individuals are sticky due to high territorial attachment or strong family ties. On the other hand, policies based on amenities would attract people moving shorter distances (mainly neighbouring regions). However, if firms (or local governments) aim to attract individuals with high human capital from other internal territories, they should pay attention also to the type of urban amenities provided locally; again, it is likely that in regions with high territorial attachment or strong family ties, policies targeting high human capital will attract mainly short distance migration or maybe international migrants with high human capital. Conversely, it is perfectly possible that the two types of policies might coexist in the same region but attract different types of flows. Unfortunately, this last hypothesis cannot be investigated in the present work since the matrix of interregional flows is not disaggregated for human capital content[40].

[40] To develop the present work further, the same analysis can be performed using flows divided by human capital content. In this way, it would be possible to know whether individuals with high human capital are always more attracted by local amenities as suggested by Glaeser et al. (2001) and Florida (2002b).

2.4 The case study: Interregional migration in Italy

To explore this specific matter, Italy represents a useful case study for many reasons. First, Italians are very attached to their places of origin, internal migration is very low and people are very sticky. Even in presence of sharp and persistent economic disparities, internal migration is very low; this pattern of migration has been named the 'empirical puzzle' (Faini et al., 1997). In examining the data of internal migration, it is worth noticing that since the 1980s the stock of migrants is almost stable at about 2% of the total population; this means that of 57.3 million inhabitants in 2002, 1.275 million moved out of their province or region of residence (see Table 2.1).

Table 2.1 Evolution of the stock of internal migrants in Italy for 1972, 1982, 1992 and 2002

Years	Population abs. v.	Migrants abs. v.	Migrants/Populations %
	(a)	(b)	(b/a) %
1972	54,643,873	1,408,267	2.6%
1982	56,742,374	1,202,371	2.1%
1992	56,757,236	1,164,368	2.1%
2002	57,321,070	1,275,339	2.2%

Source: Our elaboration on National Institute for Statistics (ISTAT).

Second, family ties in Italy are very strong; it is very likely that such immobility depends on very high psychic costs à la Sjaastad (1962). This is particularly true for the South of Italy, which is characterised by high family attachment and strong family trust associated with social mistrust. The political scientist Edward C. Bansfield (1958) investigates for the first time this particular feature of family capital in the southern part of the country; studying the case of the little town of Chiaromonte in the Basilicata region, he describes the phenomenon as amoral familism. For Bansfield (1958), family attachment and low social capital in the South are at the origin of the underdevelopment of Italy's southern regions compared to the northern ones (Putnam, 1993; Guiso et al., 2004, 2007a, 2007b).

Third, previous works applied to the Italian case identify different features of long and short distance interregional migration. Specifically, Bonifazi and Heins (2000), looking at internal migration in Italy for the time span 1955–1995, find evidence of long and short distance flows. More specifically, Etzo (2011), investigating the determinants of bilateral migration flows for a panel of Italian regions and for the time span 1996–2002, finds empirical evidence supporting long distance South to North disequilibrium migration. Etzo (2011), however, analyses only long distance migration.

Furthermore, most migration research in Italy up to now has examined interregional flows among larger areas, either regions or groups of regions, and has not examined differences in the determinants of movements of different lengths (Attanasio and Padoa-Schioppa, 1991; Faini et al., 1997; Daveri and Faini, 1999; Cannari et al., 2000; Furceri, 2006; Basile and Causi, 2005; Etzo, 2008).

The fourth and last reason why Italy is a useful case study is the availability of data on bilateral migration that is easily downloaded from the website of Italy's National Institute for Statistics (ISTAT). This reason is not trivial, as any applied scientist knows how difficult it is to find a proper dataset that is useful for investigating the research questions. Specifically, we make use of a large dataset at a provincial level (provinces correspond to county level in the United States, and NUTS 2 in the European classification). This dataset allows modelling a matrix of interprovincial movements of 10,506 observations (excluding the diagonal of 103 movements that is zero by definition).

2.5 Conclusions

This chapter discusses the key questions related to this study and illustrates the findings of empirical research regarding the role of economic variables (mainly unemployment and income) and non-economic variables (quality of life variables including amenities and social and family capital). It also discusses the findings of researchers focused specifically on testing equilibrium versus disequilibrium drivers and

theories. It emerges that their findings are not conclusive; on the contrary, they produce very country-specific results. This means that more research needs to be done in this direction. This study explores the possibility that equilibrium and disequilibrium drivers predominate in different types of migration and that both can take place within countries., It investigates this specific point in the case of interprovincial migration in Italy; recent research on Italy confirms that economic drivers are key in fostering interregional migration (Etzo, 2011). However, the research detects some descriptive evidence of long distance and short distance interprovincial migration in Italy between 1955–1995 (Bonifazi and Heins, 2000). We expect that for the case of Italy, the dynamics of long distance migration between the poorer South and the richer North are quite different to the dynamics regulating shorter distance migration patterns between relatively closer cities.

Next, Chapter 3 is devoted to the model and empirical strategy used to investigate the key questions.

CHAPTER 3

METHODOLOGY AND EMPIRICAL STRATEGY

3.1 Introduction

This chapter is dedicated to the models, the methods and the empirical strategy of the study[41]. As explained in the previous chapter, the purpose of this study is twofold. First, to investigate whether the job versus amenities hypothesis can be reconciled, that is, to check whether they can work contemporarily within the same country; second, to reconsider the impact of distance on migration. The role played by different drivers – including amenity-quality of life and social/family capital indicators – may change when one decomposes the flows according to their length, such as short and long distances. The main purpose of Chapter 3 is to explain the complex technical steps that have been followed in the phase of empirical estimation of the key questions.

This chapter is divided into two main parts. In Section 3.2, the general model is presented, while in Sections 3.3 and 3.4, the estimation method and empirical strategy are discussed.

This study considers place-to-place migration as a count variable, which describes a non-continuous phenomenon that either occurs or does not occur at all. Migration flows have such a characteristic; empirically they are a non-negative number representing the occurrences of the phenomenon. This specific characteristic of the dependent variable makes count models the most suitable to obtain unbiased results. One of the most well-known count models is the Poisson distribution based on the assumption of equidispersion. It assumes equality between the mean and the variance of the distribution under analysis. If the statistical inspection of the distribution and specific tests point out a violation of the assumption, econometric literature suggests using a negative binomial model.

[41] This part is partially taken by Biagi et al. (2011).

From a technical point of view, there is a further step to overcome: checking for possible problems of endogeneity of the explanatory variables included in the model. If this is the case, it means that economic or other types of variables affect the probability of migration but they are in turn affected by migration itself. This means that the researcher is dealing with variables that are not perfectly independent of the phenomenon under analysis (in this study, interprovincial Italian migration). When endogeneity is detected, the literature on count models suggests using instrumental variables technique and two-stage Generalised Method of Moments (GMM2S).

3.2 The model

The general model of this work is the utility maximising framework showed in Section 1.4 of Chapter 1. Assuming that individuals are rational and freely mobile, their decision to move from one location to an alternative will be based on a comparison between the expected utilities of the two locations. We assume that the individual utility is a function of economic variables, location-specific non-tradable amenities and the costs of moving, which are approximated by distance. Hence, the utility of the *i*-th location for the *k*-th individual can be formally expressed as

$$U_j^k = u(E_i, A_i) + \varepsilon_i^k \qquad (3.1)$$

where the total utility *U* includes a deterministic part *u* and a stochastic part ε_i^k. The deterministic part *u* is, in turn, a vector of economic variables (E_i) and a vector of a wide range of amenities (A_i), not only natural but also man-made. An individual will decide to migrate from location *i* (origin) to location *j* (destination) if the expected utility at the destination is greater than the expected utility at the origin plus the costs of relocating (which are a function of distance):

$$(EU_j^k) > (EU_i^k) + C(d_{ij}) \quad (3.2)$$

When Condition 3.2 is satisfied, then we define a variable M_{ij}^k being equal to one (zero otherwise). By aggregating individual movements by Italian province (103 in total) and employing a very general gravity-type cross-section model, we can write

$$\mathrm{M_{ij}} = \mathrm{f}(\Delta \mathrm{P_{ij}}, \Delta \mathrm{E_{ij}}, \Delta \mathrm{A_{ij}}, \Delta \mathrm{D_{ij}} M_{ij} = f(\Delta P_{ij}, \Delta E_{ij}, \Delta A_{ij}, \Delta D_{ij}) \quad (3.3)$$

where i indicates the origin provinces of migration flows $i = 1, 2, \ldots, 103$ $(with\ i \neq j)$ and j indicates the destination provinces of migrations flows and $j = 1, 2, \ldots, 103$ $(with\ j \neq i)$; P is a vector of population in the origin and destination; E is a vector of economic characteristics; A is a vector of social and environmental characteristics; D_{ij} represents the distance between the origin and destination; and Δ is the difference ($X_j - X_i$). This function is applied to all migration flows occurring at a specific point of time. The total number of flows is 103 x 103, but excluding the diagonal, the empirical models deal with 10,506 observations.

3.3 The estimation technique

The dependent variable of Equation 3.3 is the gross migration from province *i* to province *j*. *Dij* represents the linear distance in kilometres among the centroids of the provinces and, as such, the model can be considered to be somewhat in the spirit of the modified gravity model of Lowry (1966). The effect of distance is measured in two ways: by means of distance in kilometres between the centroid of the province (the general model) and by decomposing the flows into short and long distances (two further models). As such, it is possible to test whether economic and non-economic drivers affect short and long distance migration in different ways. It is very likely that, given the

economic, institutional and social dualism of Italy, the case study under analysis, different movements respond to different types of drivers.

The most common formulation of the gravity equation uses double logarithm form (logarithm of the dependent variable and logarithm of the independent ones) and is estimated by Ordinary Least Squares (OLS) (see Greenwood, 1985, 1997; Greenwood and Hunt, 2003). The advantage of this formulation is that the estimated parameters can be interpreted as elasticities (i.e. the percentage change of the dependent variable due to a 1% change of the independent variable, holding the other independent variables constant). The equation is represented as the following[42]:

$$\ln M_{ij} = \ln \beta_0 + \beta_1 \ln P_i + \beta_2 \ln P_j + \beta_3 \ln Y_i + \beta_4 \ln Y_j + \beta_5 \ln D_{ij} + \sum_{n=1}^{m} \beta_{jn} \ln X_{jn} + e_{ij} \qquad (3.4)$$

In the gravity formulation equation, internal migration flow (the dependent variable) is represented by means of a square matrix in which rows and columns are locations (of origin and destination). β represents the coefficient (parameter) to be estimated for each independent variable: when β is statistically significant it indicates the intensity of the relationship between each type of driver and migration; whether the variables positively or negatively affect migration depends on the sign of the coefficients resulting from regression analysis. P_i and P_j are the population in origin *i* and in destination *j*; Y_i and Y_j are the income; and D_{ij} is the distance between the origin and destination. The *X* variables change according to the purpose of the work (and the availability of data) and are generally unemployment rates, but various types of amenities (natural or man-made), education and age structure of the population are also included. In some cases, again, depending on the purpose of the work, only determinants of destination are included in *X* (Greenwood and Hunt, 2003).

Equation 3.4 has been applied to the following examples: Greenwood (1969) analyses interstate migration (48 states and 2,226 observations) over the period 1955–1960;

[42] The equation is an elaboration of Greenwood and Hunt (2003).

Mueser (1989) studies interstate flows within the United States over three decades between 1960–1989 (2,352 observations); and Mitze and Reinkowsky (2010) model German interregional flows for the period 1996–2006.

Equation 3.4 has a deterministic part (β_s), and stochastic part (ε_{ij}). The stochastic error term is added to take into account those variations in the dependent variable that cannot be explained by the *X*s and are intrinsically 'random'. In OLS all coefficients are estimated in order to minimise the sum of the square residuals and one important assumption, among others, is that the error term is homoskedastic (i.e. the distribution of ε_{ij} has a constant minimum variance)[43]. As such, in Equation 3.4 migration is a continuous random variable and the error term (ε_{ij}) is log-normally distributed with constant variance.

A first shortcoming of such specification arises in treating the dependent variable as continuous. Such type of variables can take any value in an interval, and typical examples are time and distance (Dougherty, 2002). Conversely, discrete variables have a countable number of possible values in a discrete interval (Winkelmann, 2008), and this number cannot have a negative value (i.e. the event under analysis either occurs or does not occur). Technically, this means that the dependent variable '*…takes only non negative integer values corresponding to the number of events occurring in a given interval…'* (Cameron and Trivedi, 1986, p. 29). Migration flows between each pairs of regions seem to correspond to this characteristic, and as such, they are discrete in nature: the matrix of interregional flows (place-to-place flows) is generally characterised by cells with zero flows (when the two areas do not exchange migrants) and cells with small or large flow numbers. Therefore, in order to estimate unbiased coefficients, more advanced functional form and estimation techniques need to be applied.

[43] OLS minimises $\sum_{i=1}^{n} e_i^2$ for *i* =1,2,…,*n*), that is the same as saying that OLS minimises $\sum (Y_i - \hat{Y}_i)^2$, where the former *Y* is the theoretical expected value and the latter *Y* is the estimated value; the 'hat' indicates the sample estimation of the true population value, see Studenmund (2000).

A discrete dependent variable can be modelled in various ways according to the intrinsic characteristic of the variable itself; for instance, a binary variable requires binary logistic and probit regression, an ordered variable requires ordinal logistic and ordered probit regression, while other types of discrete dependent variables such as proportional, multinomial, and count variables should be estimated with other techniques (Hilbe, 2007).

Migration between any pair of regions can be considered as a count variable, given that it either occurs or does not occur at all. Hilbe (2007, p. 8) points out that '*all count models aim to explain the number of occurrences, or counts, of an events. The counts themselves are intrinsically heteroskedastic, right skewed and have a variance that increases with the mean of the distribution.*' As a result, when the dependent variable is a count variable in nature, its distribution is characterised by heteroskedasticity, asymmetry and increasing variance. Consequently, estimating the equation by OLS will return biased results. The most popular specification of count data is the Poisson model.

3.4 The Poisson Model

Among the variety of count models, Poisson distribution is the most well known and widely used. It has the following form:

$$f_Y(y;\mu) = e^{-\mu} * \frac{\mu}{y!} \tag{3.5}$$

where *y* is the dependent variable and is a strictly non-negative number representing the number of occurrences (the dependent variable) and μ is the expected number of occurrences, often called 'intensity' or 'rate parameter'.

Poisson distribution assumes equality between the mean and the variance (equidispersion):

$$\mu_i = \exp(x_i\beta) = E\left[y_i \mid x_i\right] = Var\left[y_i \mid x_i\right] \quad (3.6)$$

where x_i is the vector of explanatory variables. The use of a Poisson distribution in modelling residential flows is not new in the migration literature: Congdon (1988) uses Poisson to analyse migration flows among 32 London boroughs for the years 1980–1981; Boyle and Halfacree (1995) apply it to gender and service class migration flows in England and Wales for the period 1980–1981; Shen (1999) employs it on interprovincial migration flows in China for the time span 1985–1990; Devillanova and García-Fontes (2004) use Poisson and negative binomial models to investigate internal migration in Spain for the period 1978–1992; Van Wissen et al. (2008) apply it to model internal flows in Sweden, Netherlands and the United Kingdom for the time span 1996–1998; Ludo (2008) employs it to model interstate migration in Mexico for the years 1995–2000; and Azzarri and Hagen-Zanker (2009) use Poisson procedure to examine internal migration in Albania for the year 2005. The general formulation of the migration model using Poisson will become:

$$M_{ij} = \exp(\sum_i \beta_i X_i + \sum_j \beta_j X_j + \beta d_{ij}) + \varepsilon_{ij} \quad (3.7)$$

However, the equidispersion assumption is a serious limitation of the Poisson model as, more often than not, real data exhibits overdispersion, that is, a variance greater than the mean. This is the classical case the literature calls ‘extra-Poisson variation’, or greater variability of the data compared to what is expected with Poisson (see Devillanova and García-Fontes, 2004).

The overdispersion of data can be detected at various levels: one can investigate the dependent variable using standard statistical techniques (mean for each percentile, standard deviation, skewness and kurtosis) and then, as suggested by Hilbe (2007), performing the z-test and the Lagrange multiplier test or ‘score test’ after the first Poisson regression with the null hypothesis of no overdispersion. If the latter is rejected

($P > |t| 0.000$), the presence of overdispersion is confirmed. In this case, as Hilbe (2007, p. 9) highlights '*…violations of equidispersion indicate correlation in the data, which affect standard errors of the parameter estimates. Model fit is also affected.*' Therefore, the conventional Poisson model produces serious biases in the parameter estimates (Cameron and Trivedi, 2005).

The traditional way to deal with overdispersion is to use mixture models; these explicitly model heterogeneity among observations by adding an extra parameter, which is a function of unobserved heterogeneity. Generally, the negative binomial model is used.

3.4.1 The negative binomial model

In negative binomial distributions, the observations of the dependent variable are skewed (see Figure 3.1). In this case, using Poisson rather than the negative binomial model will return biased results because '*the explanatory variables do not account for the full amount of individual heterogeneity in the conditional mean of the dependent variable'* (Winkelmann, 2008, p. 127). In the presence of extra Poisson variation, the mean in Equation 3.6 can be replaced by:

$$\mu_i^* = \exp(x_i\beta)\exp(e_i) \tag{3.8}$$

Negative binomial regression is considered a nonlinear regression model or a member or the generalised linear models family. The negative binomial model is a specific case of mixture models in which $\exp(\varepsilon_i)$ is supposed to be drawn from a gamma distribution so that the probability density is:

$$\Pr(y = M = x) = \frac{\Gamma(y+\alpha^{-1})}{y!\Gamma(\alpha^{-1})}\left[\frac{\alpha^{-1}}{\alpha^{-1}+\mu}\right]^{\alpha-1}\left[\frac{\mu}{\alpha^{-1}+\mu}\right]^{\gamma} \tag{3.9}$$

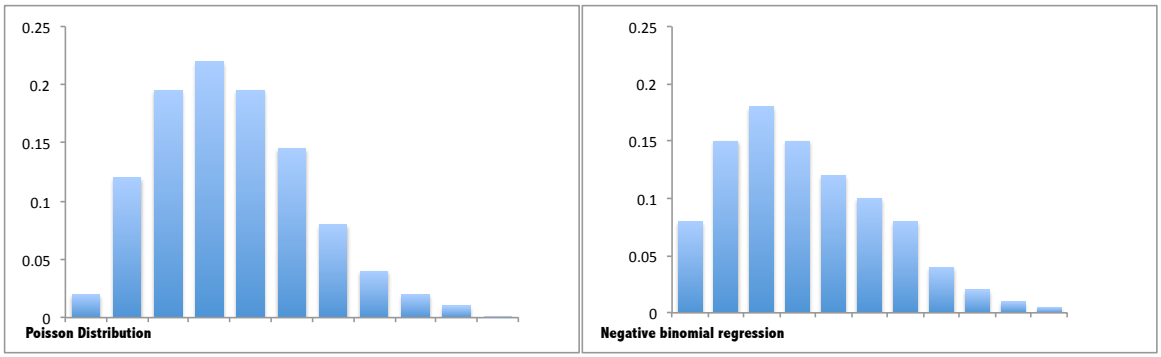
where Γ indicates the standard gamma function, and α (known as the 'ancillary parameter') represents the degree of dispersion in the predictions (the larger the α, the more spread is the data). If $\alpha = 0$, the negative binomial model reduces to a Poisson (i.e. no further overdispersion is detected).

The negative binomial model is non-linear and is normally estimated using the maximum likelihood Newton-Raphson algorithm.

The use of the negative binomial to model migration flows is relatively recent in the literature (Devillanova and García-Fontes, 2004, use it to model interprovincial flows in Spain).

In the majority of studies, the negative binomial model is considered as a derivation of a Poisson-gamma mixture model with two parameters to be estimated (α and μ), but it is also considered as a member of a single parameter exponential family distribution, such as generalised linear models (GLMs). This is possible only if the heterogeneity parameter is held constant given that a GLM algorithm can estimate only two parameters at a time: μ and the $\exp(\beta x)$. On the contrary, the maximum likelihood Newton-Raphson algorithm allows knowledge of α and μ but does not give the goodness-of-fit tests and residual analysis of GLM. For such reasons, Hilbe (2007) suggests a two-stage estimation procedure: in the first stage, the model is run with the maximum likelihood Newton-Raphson algorithm and μ, α and $\exp(\beta x)$ are estimated; in the second stage, the same model is run with GLMs including the constant parameter α found in the first stage. The latter estimation uses Fisher-scores based on an iteratively re-weighted least square algorithm. The results of the parameters $\exp(\beta x)$ and μ are almost the same as obtained in the first stage but using GLM allows to check also the goodness-of-fit and the robustness of the estimation. This study follows this procedure.

Figure 3.1. Poisson and Negative Binomial Distributions



Source: Our elaboration.

3.4.2 Robustness check: How to address endogeneity in count models

Causal relationships among dependent variable and predictors require exogeneity of the latter (independent explanatory variables) and, as such,

$$E(y|x) = \exp(x'\beta) \tag{3.10}$$

Where y is the dependent variable, xx is the independent, and β is the slope coefficient that indicates the reaction of y to any variation of x. If explanatory variables are exogenous, the stochastic error should be independent of x and constant[44]:

$$E(u|x) = E(y\exp(-x'\beta|x) = 1 \tag{3.11}$$

If this is not the case and $E(u|x) \neq 1$, the results of the estimates will be biased. Many models of migration, encounter endogeneity problems, in that the left hand side and right hand side variables are often partially co-determined. Potentially, all explanatory variables could suffer such a problem. Endogeneity occurs when $E(u|x)$ is a function of

[44] For simplicity, as in Winkelmann (2008), the error is normalised to 1.

x and this function is not a constant. Consequently, one will have $E(y|x) \neq \exp(x'\beta)$ and the stochastic error is not independent of x, this is particularly true in the case of economic variables because increasing migration may increase nominal land prices and wages in the destination, and therefore gross domestic product (GDP) (Greenwood, 1997). When performing cross-section analysis, the use of predetermined independent variables should partially reduce the problem. However, in count models, the issue of endogeneity can be dealt with by using non-linear instrumental-variable techniques and GMM, suggested by Mullahy (1997) and Winkelmann (2008).

Instrumental variables are very difficult to find; however, when they are identified properly by means of GMM approach, endogeneity can be adjusted. The instruments have to be correlated with the independent variable under scrutiny (which is suspected to be endogenous), and uncorrelated with the dependent variable (i.e. the instrument has to be exogenous with respect to the dependent variable). One difficult task researchers must tackle is finding proper instruments.

In migration models, the economic variables are generally suspected of endogeneity. The only study that uses negative binomial regression to model interprovincial flows does not address possible problems of endogeneity of economic variables (the work on Spain of Devillanova and García-Fontes, 2004).

In the present study, we use a two-stage GMM (GMM2S) robust estimator and the routines and tests presented in Baum et al. (2007). Following (Wooldridge, 2001)

GMM is based on moment functions that depend on observable random variables and unknown parameters, and that have zero expectation in the population when evaluated at the true parameters. Hansen (1982) explains that the moment conditions could be used to estimate parameters consistently under weak assumptions. He demonstrates that instrumental variables can be better computed with a GMM estimator. As Wooldridge (2001, p. 94) highlights, '*perhaps even more important, Hansen showed how to choose among the many possible method of moments estimators in a framework that allows for heteroskedasticity, serial correlation and nonlinearities*.'

The GMM estimator uses a weighting matrix that accounts for heteroskedasticity of unknown form. As Wooldrige (2001, p. 90) perfectly explains, '*The weighting matrix is*

obtained by inverting a consistent estimator of the variance-covariance matrix of the moment conditions. If there are m>k+1 total moment conditions, where k is the number of covariates in the model, then the weighting matrix has dimension mxm. The GMM estimator minimizes a quadratic form in the sample moment conditions, where the weighting matrix appears in the quadratic form…. Then, the weighting matrix can be taken to be a diagonal matrix, where each diagonal element is the reciprocal of the variance of the corresponding moment condition. In other words, moment conditions with larger variances receive relatively less weight in the estimation, since they contain less information about the population parameters. Moment conditions with smaller variances receive relatively more weight. In the more realistic case where the moment conditions are correlated, the weighting matrix efficiently combines the moment conditions by accounting for different variances and nonzero correlations.' In practice, the procedure consists of two stages: first, the endogenous variable is regressed on instrument (z). This regression provides the predicted values of x. The predicted values (instead of the actual values) of x are then used as explanatory variables in the structural equation that is further re-estimated. The resulting coefficients on the predicted x are the instrumental variables estimates of the parameters of the x.

After the regression, a set of tests provides information about the instrumental variable regression (Baum, 2007): the endogeneity test of the variables (H_0: the variable under scrutiny is exogenous); the Kleibergen-Paap rk LM statistic for underidentification (H_0: underidentification); the Anderson-Rubin Wald test for weak instruments (H_0: weak instruments); and the Stock-Wright LM S statistic for weak instruments (H_0: $\beta_1 = 0$ and overidentifying restrictions are valid).

3.5 Conclusions

The purpose of this chapter is to give an overview of the model applied to this study and the techniques that will allow investigation of the topic under scrutiny. The distributional characteristic of the dependent variable suggests the use of count models, in particular

the application of the negative binomial model. The use of the negative binomial in gravity-type interregional migration is new and very few applications are available. As far as we know, this is the first study to date addressing endogeneity problems in negative binomial regression applied to interregional migration flows.

CHAPTER 4

THE DATA

4.1 Introduction

This chapter focuses on the description of the data collected for the analysis[45]. Section 4.2 explains the source and distribution characteristics of the dependent variable: province-to-province migration flows in Italy for 2001–2002. Section 4.3 explains and describes the independent variables – or group of variables – and refers to previous empirical literature. Section 4.4 describes the evolution of interprovincial flows in Italy from the 1970s to the present. Section 4.5 provides some descriptive insights into the different behaviour of long and short distance migration in Italy and Section 4.5 gives the main conclusions.

4.2 The dependent variable

Currently, Italy is divided administratively into 20 regions, 107 provinces and 8,092 municipalities. The number of provinces has increased over time.

The data on province-to-province migration flows used in the present study is issued by the Italian National Institute for Statistics (ISTAT), specifically the *Migratory movements of resident population—Registrations and cancellations to the registry office*) (2006) for the years 2001–2002. Given that there were 103 provinces in 2001, the square matrix of movements is 103 x 103. In total, excluding the diagonal, we deal with 10,506 observations on gross migration flows. The diagonal is excluded because it is zero by definition.

[45] This part is partially taken by Biagi et al. (2011).

A preliminary statistical inspection of the dependent variable indicates that the mean and the variance are very different and that the distribution is not normal and very skewed. A further test on the normality of the distribution (H_0: normality and symmetry) rejects the null hypothesis and indicates that the distribution is non-normal and asymmetric (Table 4.1)[46].

Table 4.1. **Gross flows summary statistics**

Obs	Mean	SD	Variance	Skewness	Kurtosis
10,506	44.60	141.47	20,012.99	11.18	188.72
	Percentiles	Smallest			
1%	0	0			
5%	1	0			
10%	2	0			
25%	5	0			
50%	12	0			
		Largest			
75%	31	2,575			
90%	88	3,244			
99%	549	3,712			

Skewness/Kurtosis tests for Normality

		------ joint -----		
Variable	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
minf01	0.000	0.000	.	

Source: Our elaboration.

4.3 The independent variables

The independent variables are divided into six main categories: spatial, economic, demographic, human capital, social-family capital and amenity-quality of life variables. Except for the dummies and the distance, all other variables are expressed in terms of difference between the values at destination and origin. Table 4.2 illustrates the variables under investigation.

As discussed in Chapter 1, gravity and spatial interaction models widely recognise the key role of space in migration processes (Greenwood, 1997; Cushing and Poot, 2004;

[46] As highlighted in Section 3.3 of Chapter 3, to further check for problems of non-normality and skewness other tests were performed. As suggested by Hilbe (2007) the tests are z-test and the Lagrange multiplier test or 'score test'. Those tests are performed after the first Poisson regression (with H_0: no overdispersion).

LeSage and Pace, 2008). The spatial interaction models control for the negative effect of space using the geographic distance between provinces; distance is also interpreted as a proxy for the general cost of moving (Juarez, 2000). In this study, migration is also divided along distance, either long or short. The former are movements between non-adjacent macro regions; the latter are movements between provinces within the same region (migration that is higher than the threshold of 70 km)[47].

The economic disparities are measured using Gross Domestic Product (GDP) per capita and unemployment rate, even though the extended version of the gravity model à la Lowry (1966) employs wages and unemployment rate. Data on average wages and GDP are very difficult to find since the ISTAT does not calculate them at the provincial level. Provincial GDP per capita is provided by the Guglielmo Tagliacarne Institute (see Table 4.2). It is worth noting that GDP is often used in gravity models (Congdon, 1988; Shen, 1999; Devillanova and García-Fontes, 2004) and, as in previous research, one expects that the higher the GDP in the destination, the higher the in-migration and the lower the out-migration. Conversely, the higher the unemployment rates in the origin, the higher the out-migration (a push factor) (DaVanzo, 1978). Here, the unemployment rate is also a way of measuring inter-provincial differences in employment opportunities.

As far as demographic variables are concerned, we include the destination-origin difference in both the total population and the percentages of three age-subgroups (20–39; 40–65; and over 65). Human capital is proxied by the educational level of the population and in particular the number of residents with a secondary school diploma per 10,000 inhabitants. We also control for social capital both at a macro and at a micro level. At the macro level, we follows the work by Putnam (1993, 1995) and Helliwell and Putnam (1995) whereby we measures the level of social and political participation. Here we use the destination-origin difference in the number of people participating in sports associations and people working voluntarily in charity organisations (both standardised per 10,000 inhabitants); and the difference in the percentage of people that voted in the

[47] Short distance province-to-province movements may also include commuting patterns. In order to exclude them, we consider just short distance movements greater than 70 km. This threshold distance allows us to exclude most commuting patterns. Taking for instance the case of the largest city in Italy, Milan, many people working in Milan live in the surrounding cities where the quality of life is higher and the house prices are lower. However, the distance between Milan and the closest neighbouring city is much shorter than 70 km. Pavia is only 38 km away, Lecco 55 km and Como 49 km.

Referendum of 11 June 1995 over the number of potential voters. We also include 'negative' social capital measured as the destination-origin difference in the number of crimes per 10,000 inhabitants (recorded in the Italian Penal Code relating to Mafia involvement). In addition, following the argument of a variety of social capital researchers (Banfield, 1958; Coleman, 1988; Hao, 1994; Fukuyama, 1995, 1997; Guiso et al., 2004; Alesina and Giuliano, 2007), we includes a variable for family capital, measured as the difference between the family size in the destination and origin, normalised for the average for Italy as a whole.

Following the tradition of equilibrium studies on migration and hedonic studies (Graves, 1976; Roback, 1982; Blomquist et al., 1988), the amenity-related quality of life dimension is measured by means of six variables. The first variable, representing disamenities, is the destination-origin difference in the number of robberies (per 10,000 inhabitants). Furthermore, three environmental amenities variables are also included: a dummy for non-coastal provinces with a mountain surface of at least 50%; a dummy for destination provinces on the coastline; and a dummy for destination provinces with a national park. Finally, in order to control for some additional aspects possibly related to the existence of urbanised economies, we employ a dummy variable to capture the presence of an international airport in the destination province.

Table 4.2. Independent Variables and Summary Statistics

	Definition	Mean	SD
Distance	Linear distance in kilometres between the centroids of the provinces	445.34	269.73
Economic Variables			
GDP	GDP per capita at current prices. Year 1999. Source: Our elaboration on Gugliermo Tagliacarne Institute.	16,051.24	4,380.842
Unemployment	Unemployment rates (people looking for a job /labour force) * 100. Year 1999. Source: Our elaboration on ISTAT, Sistema di Indicatori Territoriali (downloaded April 2009).	11.16	7.90
Demographic Variables			
Population	Total population. Year 1999. Source: ISTAT, Sistema di Indicatori Territoriali (downloaded 21 July 2008).	559,676.70	615,704.80
Age 20-39	Percentage of those between 20 and 39 years of age over the total population. Year 1998. Source: Our elaboration on ISTAT, Atlante Statistico dei Comuni.	29.89	1.51
Age 40-64	Percentage of those between 40 and 64 years of age over the total population. Year 1998. Source: Our elaboration on ISTAT, Atlante Statistico dei Comuni.	31.83	2.12
Age 65+	Percentage of those above 65 years of age over the total population. Year 1998. Source: Our elaboration on ISTAT, Atlante Statistico dei Comuni.	19.04	3.19
Human Capital			
Diploma	People with Italian diploma per 10,000 inhabitants. Year 1991. Source: Our elaboration on ISTAT, Atlante Statistico dei Comuni.	1,677.59	246.02
Social Capital			
Sport	Individuals per 10,000 inhabitants practising sports and enrolled in sport associations. Year 1997. Source: ISTAT - Statistiche culturali Anno 2000–2001 published in 2004 on data of Comitato Olimpico Nazionale Italiano (CONI).	7,481.18	2,664.34
Voters	Percentage of people that actually voted in the 11 June 1995 Italian Referendum over the total number of voters. Source: Our elaboration on Ministero dell'Interno.	56.92	10.80
Family	Average households in each province divided by average households in Italy. Year 1991. Source: Our elaboration on ISTAT-CENSUS 2001.	1	0.09
Crime Association	Crime associations included Italian Mafia per 10,000 inhabitants. Year 1998. Source: Our elaboration on Ministero Grazie e Giustizia.	0	0.21
Amenities and Disamenities			

Robberies	Robberies per 10,000 inhabitants. Year 1998. Source: Our elaboration on Ministero di Grazia e Giustizia.	263.082 118.6138
Mount	Dummy variable: 1 = non-coastal province with mountain surface >50%; 0 = otherwise (*number of 0 = 8,364*). Source: Our elaboration on ISTAT, Sistemi di indicatori Territoriali.	
Coast	Dummy variable: 1 = at least one side of the province on the coast; 0 = otherwise *(number of 0 = 5,100)*. Source: Our elaboration	
Park	Dummy variable: 1 = presence of at least 1 national park; 0 = otherwise *(number of 0 = 6,324)*. Source: Our elaboration on www.parks.it	
Airport	Dummy variable: 1 = international airport mainly; 0 = otherwise (*number of 0 = 9,282*). Source: Our elaboration on www.aeroporti.com (July 2007).	
University	Dummy variable: 1 = presence of a University in the province; 0 = otherwise (*number of 0 = 5,610*). With around 133,178 enrolments in the academic year 2007–2008 the *Università di Roma La Sapienza* is the biggest public university in Italy, while the smallest public university is the *Università degli Stranieri di Siena* with 500 enrolments. Source: Our elaboration on MIUR.	

4.4 Interregional migration in Italy

Interregional migration flows in Italy have gone through various phases during the second half of the 20th century. In the early post-war years spanning from the early 1950s–1970s, there were intense migration flows from the South of Italy (mainly rural) to the more urbanised North. The migration system was clearly a disequilibrium system in that migrants from poorer low wage regions were moving in very large numbers to higher wage regions. During the seventies, internal migration slowed down with respect to previous decades: at the beginning of the eighties until the beginning of the nineties, the percentage of population that migrated internally remained stable (around 2%). Despite ~~of~~ this, the evolution of regional demographic changes highlights some important facts. Table 4.3 shows the pattern of population changes for the three main macro areas of Italy (North, Centre and South) at the beginning of each decade 1972-1982-1992-2002. Data on population (population and natural change) come from the Demographic Statistics of ISTAT (Census Data) while data on internal migration come from a different publication of ISTAT named *Population and Demographic Movements by Municipality*. In this publication, movements are collected at a municipality level and

include all types of residential inflows and outflows (people coming from or moving to a municipality of the same province, or of a different province).

Population change is the result of the sum of natural change –*i.e.* the difference between births and deaths- and net migration -the difference between out-migration and in-migration. The comparison of the four decades highlights how net migration in the Northern part of the country has always shown a positive balance while in the Southern regions this trend changes according to the period under analysis. In particular, when looking at population change, it is worth noticing how at the beginning of the seventies this is still quite high in the North in both its components, the natural change and the number of in-migrants (pulled in mainly from the Southern and more disadvantaged regions of the country). This provides some first hints that at least during the seventies the simple classical model of labour migration was at work in the country. At the beginning of the eighties the population change in the North became negative, net migration slowed down consistently with respect to the previous decade but remained positive, the natural change became negative. During the eighties the migration slowed down in Italy as whole (including the southern regions) but this was not explained but any reduction of the North-South disparities. On the contrary, the unemployment gap increased in the entire decade (see Figure 4.3). The slow down of internal migration associated to the increase of regional economic disparities has been considered by migration literature as an "empirical puzzle" (Faini *et al.,* 1997).

At the beginning of the nineties population change in the North becomes again positive and is driven by the capacity of the area to pull individuals – in fact, the pace at which the natural change in the North decreases with respect to the previous decade is rather impressive. In the Southern areas of the country, the natural change and the net migration are still positive but the slowdown with respect to the previous decade is rather evident.

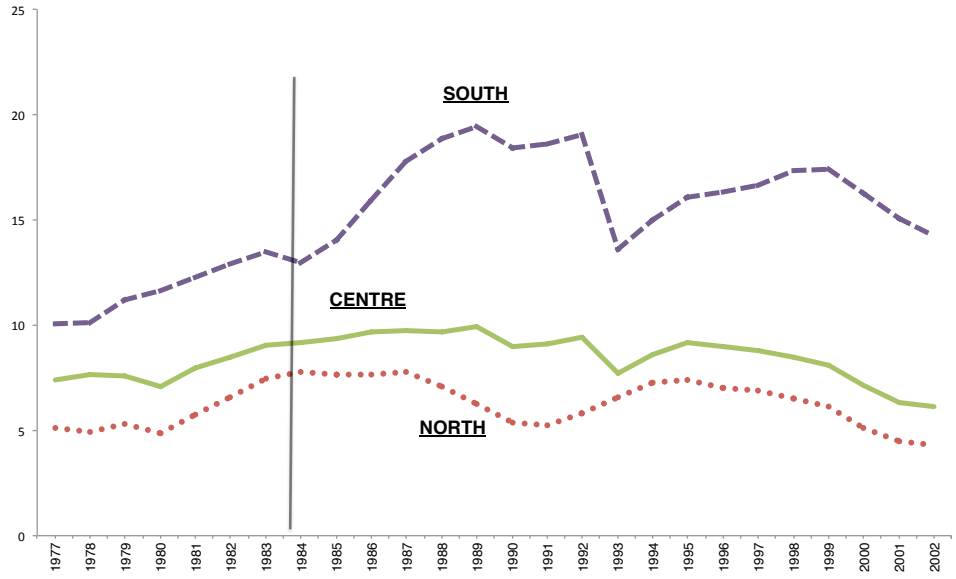
At the beginning of the noughties, the South-to-North migration increases again and the balance of net migrants in the South becomes dramatically negative.

Table 4.3. Components of regional population change in Italy for macro areas. 1972-2002

1972								
Areas	Popn	Popn change	Natural change	Net Migration				
North	25,166,994	164,722	104,775	59,947				
Centre	10,389,905	68,922	60,743	8,179				
South	19,077,695	135,903	210,104	-74,201				
1982					1972-82			
Areas	Popn	Popn change	Natural change	Net Migration	Popn	Popn change	Natural change	Net Migration
North	25,675,827	-20,285	-40,797	20,512	*2.0%*	*-112.3%*	*-138.9%*	*-65.8%*
Centre	10,834,933	25,700	1,905	23,795	4.3%	-62.7%	-96.9%	190.9%
South	20,231,614	142,049	135,888	6,161	*6.0%*	*4.5%*	*-35.3%*	*108.3%*
1992					1982-92			
Areas	Popn	Popn change	Natural change	Net Migration	Popn	Popn change	Natural change	Net Migration
North	25,316,961	28,851	-52,252	81,103	*-1.4%*	*242.2%*	*-28.1%*	*295.4%*
Centre	10,921,533	13,973	-12,838	26,811	0.8%	-45.6%	-773.9%	12.7%
South	20,582,756	96,374	95,268	1,106	*1.7%*	*-32.2%*	*-29.9%*	*-82.0%*
2002					1992-02			
Areas	Popn	Popn change	Natural change	Net Migration	Popn	Popn change	Natural change	Net Migration
North	25,782,796	49,804	-32,857	82,661	*2.0%*	*-112.3%*	*-138.9%*	*-65.8%*
Centre	10,980,912	6,970	-15,304	22,274	0.5%	-50.1%	-19.2%	-16.9%
South	20,557,362	-11,382	28,966	-40,348	*-0.1%*	*-111.8%*	*-69.6%*	-3748.1%

Source: our elaboration ISTAT Population and Demographic Movements by Municipality.
Note: population change is the sum of natural balance and net migration; natural change is the difference between births –deaths; net migration is the difference between in-migration and out-migration.

Figure 4.3 Unemployment rate in Italy for macro areas. 1977-2002



Source: Istat.

Looking more specifically at the 103 Italian provinces, it is worth to notice than on average the number of provinces in which the population change becomes negative starts in the eighties and is particularly strong in the provinces containing big cities such as Turin, Milan, Genoa and to a lesser extent Venice (all located in the North, Table 4.4a), Florence and Rome (locate in the Centre Table 4.4b) Naples and Palermo (located in the South Table 4.4.c). The negative balance of such provinces is always due to the magnitude of out-migration, although also the natural change of the population is negative. Medium and small provinces seem to have less negative performance.

Table 4.4a Components of regional population change in the Italian provinces of the North. 1972-2002

			1972			1982			1992			2002		
Italian Provinces	Region	Macro area	Popn change	Natural chance	Net Migration	Popn change	Natural change	Net Migration	Popn change	Natural change	Net Migration	Popn change	Natural change	Net Migration
Alessandria	Piedmont	North	-207	-1713	1506	-2195	-3344	1149	-727	-3611	2884	-1731	-3228	1497
Asti	Piedmont	North	900	-572	1472	-1054	-1562	508	15	-1539	1554	-379	-1078	699
Biella	Piedmont	North	166	-272	438	-707	-1140	433	-338	-1075	737	-550	-1032	482
Cuneo	Piedmont	North	1477	-131	1608	560	-1715	2275	669	-1906	2575	412	-1670	2082
Novara	Piedmont	North	2443	104	2339	200	-1008	1208	1797	-1166	2963	1019	-858	1877
Turin	*Piedmont*	*North*	*19051*	*13937*	*5114*	*-15953*	*-2007*	*-13946*	*-1002*	*-3946*	*2944*	*-3476*	*-2953*	*-523*
Verbano-C.O.	Piedmont	North	946	485	461	-568	-434	-134	56	-573	629	-226	-685	459
Vercelli	Piedmont	North	-558	-623	65	-1030	-1280	250	-392	-1252	860	-950	-1068	118
Aosta	V. d'Aosta	North	1082	304	778	590	-153	743	1089	-255	1344	489	-228	717
Bergamo	Lombardy	North	8705	6718	1987	3826	2121	1705	5899	1280	4619	7823	2254	5569
Brescia	Lombardy	North	9189	6386	2803	3519	1140	2379	4035	470	3565	6778	1947	4831
Como	Lombardy	North	3684	2731	953	2034	537	1497	2403	21	2382	3348	-5	3353
Cremona	Lombardy	North	-196	-8	-188	-345	-1141	796	705	-1403	2108	921	-1001	1922
Lecco	Lombardy	North	2842	1481	1361	1121	269	852	1925	8	1917	1875	238	1637
Lodi	Lombardy	North	507	369	138	293	-510	803	1244	-365	1609	1821	-183	2004
Mantova	Lombardy	North	1747	649	1098	-140	-1562	1422	-397	-1605	1208	828	-947	1775
Milan	*Lombardy*	*North*	*31105*	*25308*	*5797*	*-8691*	*1040*	*-9731*	*-2851*	*-987*	*-1864*	*-3697*	*1831*	*-5528*
Pavia	Lombardy	North	-619	-1123	504	-1347	-3531	2184	-307	-3477	3170	1269	-2737	4006
Sondrio	Lombardy	North	444	1097	-653	838	329	509	447	27	420	184	-91	275
Varese	Lombardy	North	10830	5012	5818	1197	536	661	2457	-243	2700	2954	-155	3109
Bolzano	Trentino A.A	North	3174	4122	-948	961	1837	-876	2970	1810	1160	2101	1551	550
Trento	Trentino A.A	North	2225	1729	496	-128	-326	198	1372	223	1149	2783	772	2011
Belluno	Veneto	North	686	420	266	-506	-901	395	-370	-736	366	-251	-649	398
Padua	Veneto	North	7088	6282	806	1755	706	1049	2549	464	2085	3159	368	2791
Rovigo	Veneto	North	-236	875	-1111	-302	-522	220	-584	-971	387	-559	-1087	528
Treviso	Veneto	North	5706	4599	1107	3097	833	2264	2603	95	2508	5677	1314	4363
Venice	*Veneto*	*North*	*6379*	*6119*	*260*	*204*	*-164*	*368*	*-873*	*-1138*	*265*	*-233*	*-931*	*698*
Verona	Veneto	North	5727	4701	1026	2051	214	1837	2746	-290	3036	4126	513	3613
Vicenza	Veneto	North	7138	4877	2261	2774	903	1871	2914	927	1987	4482	1572	2910
Gorizia	Friuli V.G.	North	1598	477	1121	-438	-788	350	-271	-726	455	278	-635	913
Pordenone	Friuli V.G.	North	2280	1161	1119	279	-377	656	-65	-729	664	1770	-311	2081
Trieste	Friuli V.G.	North	343	-984	1327	-2966	-2859	-107	-2811	-2384	-427	-1851	-2075	224
Udine	Friuli V.G.	North	938	889	49	-280	-1845	1565	-968	-2122	1154	466	-1669	2135
Genoa	*Liguria*	*North*	*963*	*-1017*	*1980*	*-7898*	*-6925*	*-973*	*-7776*	*-6225*	*-1551*	*-6233*	*-5768*	*-465*
Imperia	Liguria	North	1176	208	968	-862	-1494	632	2892	-1116	4008	-407	-1225	818
La Spezia	Liguria	North	131	186	-55	-1083	-1078	-5	-567	-1254	687	-796	-1420	624
Savona	Liguria	North	3188	177	3011	101	-2009	2110	527	-1713	2240	294	-1539	1833
Bologna	Em. R.	North	5901	1058	4843	-1169	-4080	2911	1182	-4124	5306	3121	-2612	5733
Ferrara	Em. R.	North	1211	977	234	-1272	-1855	583	-1313	-2309	996	-645	-2181	1536
Forlì-Cesena	Em. R.	North	2919	1875	1044	533	-160	693	755	-861	1616	1605	-712	2317
Modena	Em. R.	North	5501	2386	3115	696	-984	1680	1016	-1207	2223	2727	-285	3012
Parma	Em. R.	North	1082	228	854	-709	-1869	1160	666	-2080	2746	1230	-1644	2874
Piacenza	Em. R.	North	-207	-329	122	-471	-1705	1234	629	-1485	2114	369	-1299	1668
Ravenna	Em. R.	North	1761	977	784	-1029	-1112	83	-354	-1514	1160	920	-1227	2147
Reggio nell'E.	Em. R.	North	2007	1002	1005	1206	-948	2154	2240	-1078	3318	4945	-157	5102
Rimini	Em. R.	North	2505	1641	864	3023	126	2897	3015	-112	3127	2014	128	1886

Source: our elaboration ISTAT Population and Demographic Movements by Municipality.

Note: population change is the sum of natural balance and net migration; natural change is the difference between births –deaths; net migration is the difference between in-migration and out-migration.

Table 4.4b Components of regional population change in the Italian provinces of the Centre. 1972-2002

			1972			1982			1992			2002		
Italian Provinces	Region	Macro area	Popn change	Natural chance	Net Migration	Popn change	Natural change	Net Migration	Popn change	Natural change	Net Migration	Popn change	Natural change	Net Migration
Arezzo	Tuscany	Centre	1258	812	446	206	-631	837	130	-953	1083	473	-943	1416
Firenze	*Tuscany*	*Centre*	*8658*	*2872*	*5786*	*-1672*	*-3494*	*1822*	*-4794*	*-4079*	*-715*	*-2301*	*-2664*	*363*
Grosseto	Tuscany	Centre	2459	556	1903	-112	-797	685	1686	-1055	2741	-66	-865	799
Livorno	Tuscany	Centre	2734	1402	1332	463	-937	1400	732	-1267	1999	-78	-1343	1265
Lucca	Tuscany	Centre	1462	786	676	-630	-1415	785	-466	-1697	1231	184	-1424	1608
Massa-C.	Tuscany	Centre	1283	596	687	-283	-486	203	-373	-932	559	-255	-846	591
Pisa	Tuscany	Centre	1630	1158	472	542	-1066	1608	-276	-1408	1132	311	-1230	1541
Pistoia	Tuscany	Centre	1632	666	966	583	-749	1332	455	-1132	1587	897	-688	1585
Prato	Tuscany	Centre	2545	1128	1417	1371	201	1170	666	-130	796	524	165	359
Siena	Tuscany	Centre	238	-18	256	-368	-1053	685	174	-1460	1634	508	-1221	1729
Perugia	Umbria	Centre	2213	1708	505	1502	-452	1954	1872	-1253	3125	1603	-1197	2800
Terni	Umbria	Centre	1036	612	424	337	-340	677	-239	-809	570	10	-933	943
Ancona	Marche	Centre	-403	1611	-2014	1625	-291	1916	362	-778	1140	1132	-790	1922
Ascoli Piceno	Marche	Centre	1276	1694	-418	1322	543	779	2191	-191	2382	694	-612	1306
Macerata	Marche	Centre	826	1104	-278	390	-33	423	400	-590	990	308	-717	1025
Pesaro e Urb.	Marche	Centre	1827	1284	543	930	175	755	294	-529	823	1936	-358	2294
Frosinone	Lazio	Centre	5425	3063	2362	2954	1982	972	1717	686	1031	-1024	-629	-395
Latina	Lazio	Centre	7634	4930	2704	5352	3102	2250	4164	1808	2356	2023	938	1085
Rieti	Lazio	Centre	0	157	-157	898	-123	1021	2000	-224	2224	331	-593	924
Roma	*Lazio*	*Centre*	*23780*	*33775*	*-9995*	*8471*	*7740*	*731*	*1028*	*3539*	*-2511*	*-1050*	*1617*	*-2667*
Viterbo	Lazio	Centre	1409	847	562	1819	29	1790	2250	-384	2634	810	-971	1781

Source: our elaboration ISTAT Population and Demographic Movements by Municipality.

Note: population change is the sum of natural balance and net migration; natural change is the difference between births –deaths; net migration is the difference between in-migration and out-migration.

Table 4.4c Components of regional population change in the Italian provinces of the South. 1972-2002

			1972			1982			1992			2002		
Italian Provinces	Region	Macro area	Popn change	Natural chance	Net Migration	Popn change	Natural change	Net Migration	Popn change	Natural change	Net Migration	Popn change	Natural change	Net Migration
Chieti	Abruzzo	South	2277	1929	348	1787	929	858	1507	-20	1527	-477	-915	438
L'Aquila	Abruzzo	South	1133	750	383	1047	225	822	228	-451	679	-585	-1136	551
Pescara	Abruzzo	South	3112	2026	1086	404	657	-253	772	209	563	356	-370	726
Teramo	Abruzzo	South	899	1762	-863	1620	945	675	1504	420	1084	584	-274	858
Campobasso	Molise	South	122	1151	-1029	201	424	-223	259	83	176	-351	-498	147
Isernia	Molise	South	346	412	-66	43	139	-96	-47	-158	111	-117	-304	187
Avellino	Campania	South	733	3449	-2716	1488	2246	-758	2626	1517	1109	-171	-180	9
Benevento	Campania	South	488	2014	-1526	1641	1414	227	929	716	213	-649	-418	-231
Caserta	Campania	South	6982	8806	-1824	10281	7376	2905	7751	6201	1550	1428	3092	-1664
Napoli	*Campania*	*South*	*28754*	*41868*	*-13114*	*24103*	*29118*	*-5015*	*22489*	*24461*	*-1972*	*8383*	*14422*	*-6039*
Salerno	Campania	South	5651	10733	-5082	6810	7610	-800	5253	5183	70	-1214	1447	-2661
Bari	Puglia	South	14546	16989	-2443	10671	11117	-446	8127	8189	-62	1733	4567	-2834
Brindisi	Puglia	South	3610	4349	-739	2871	3086	-215	1128	2073	-945	-941	475	-1416
Foggia	Puglia	South	1857	8410	-6553	3505	5200	-1695	710	3540	-2830	-2080	1780	-3860
Lecce	Puglia	South	8528	7443	1085	9501	5100	4401	4152	3031	1121	-65	775	-840
Taranto	Puglia	South	6520	7310	-790	4391	4549	-158	1502	3126	-1624	-861	705	-1566
Matera	Basilicata	South	2240	2377	-137	1056	1487	-431	-42	749	-791	-540	267	-807
Potenza	Basilicata	South	432	3433	-3001	1382	2059	-677	470	1069	-599	-1359	-318	-1041
Catanzaro	Calabria	South	-5351	3441	-8792	2226	2503	-277	544	1529	-985	-806	218	-1024
Cosenza	Calabria	South	2376	7791	-5415	6619	5120	1499	1836	3132	-1296	-1810	356	-2166
Crotone	Calabria	South	1066	3241	-2175	1589	2259	-670	872	1480	-608	-701	470	-1171
Reggio di C.	Calabria	South	1607	5348	-3741	1469	3689	-2220	1189	2089	-900	-2401	145	-2546
Vibo Valentia	Calabria	South	-780	1737	-2517	691	1366	-675	236	929	-693	-910	125	-1035
Agrigento	Sicilia	South	3322	4536	-1214	3928	2935	993	3197	2287	910	-1177	352	-1529
Caltanissetta	Sicilia	South	1697	2974	-1277	2325	1766	559	356	1542	-1186	-1464	300	-1764
Catania	Sicilia	South	6931	11007	-4076	9864	6547	3317	8507	6299	2208	644	2470	-1826
Enna	Sicilia	South	175	1812	-1637	705	1020	-315	346	578	-232	-581	-60	-521
Messina	Sicilia	South	2772	4586	-1814	2461	2114	347	3964	1170	2794	-3533	-1200	-2333
Palermo	*Sicilia*	*South*	*8878*	*12009*	*-3131*	*10130*	*8485*	*1645*	*6811*	*7628*	*-817*	*-1769*	*2474*	*-4243*
Ragusa	Sicilia	South	2002	2095	-93	2461	1513	948	1439	1004	435	49	317	-268
Siracusa	Sicilia	South	3903	4047	-144	2221	2503	-282	1886	1602	284	-797	313	-1110
Trapani	Sicilia	South	1780	3210	-1430	3399	1731	1668	1622	1288	334	-322	200	-522
Cagliari	Sardegna	South	9957	8788	1169	5123	5378	-255	2165	2051	114	1105	111	994
Nuoro	Sardegna	South	1311	2605	-1294	347	1258	-911	87	421	-334	-889	-381	-508
Oristano	Sardegna	South	1434	1120	314	937	529	408	297	-31	328	-393	-394	1
Sassari	Sardegna	South	4593	4546	47	2752	1491	1261	1702	332	1370	1299	33	1266

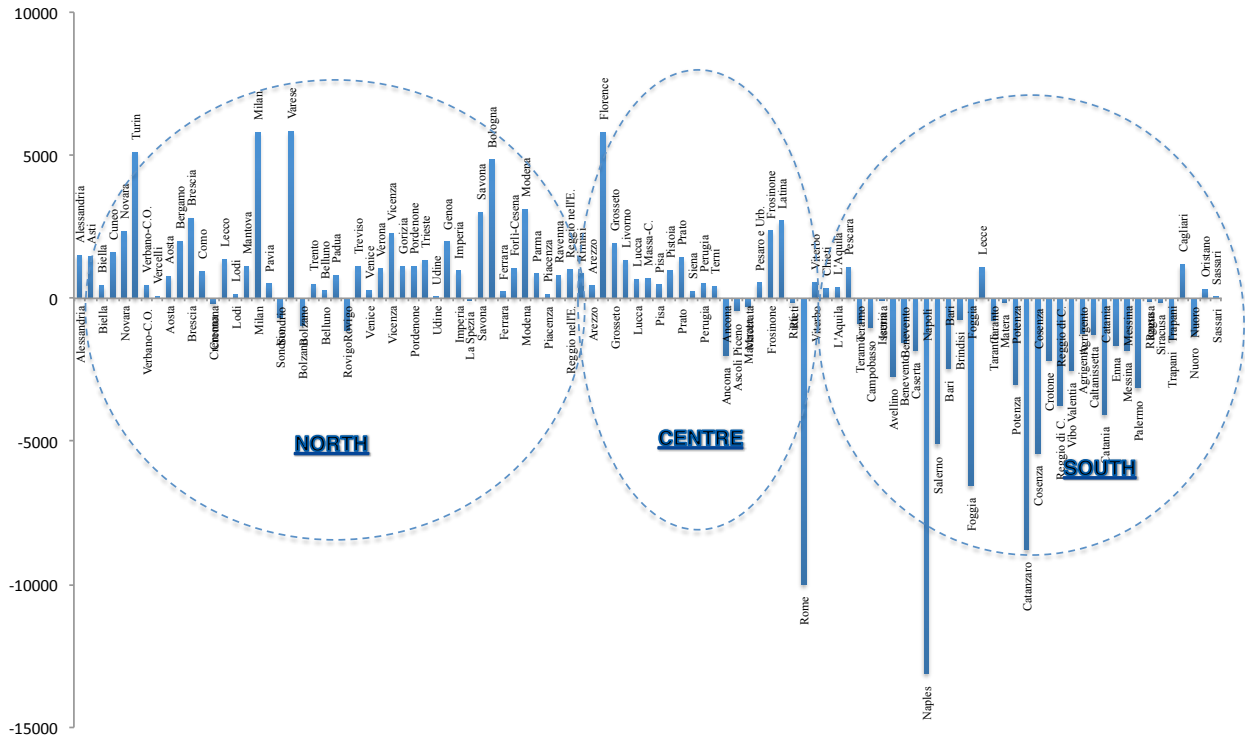
Source: our elaboration ISTAT Population and Demographic Movements by Municipality.

Note: population change is the sum of natural balance and net migration; natural change is the difference between births –deaths; net migration is the difference between in-migration and out-migration.

The provinces located in the South show a positive population change that has been sustained by the positive natural change. However, starting from the last decades, also the natural change becomes negative; at the beginning of the noughties net migration become rather negative (Table 4.4. c).

Figure 4.4 - 4.5 and 4.6 investigates in more depth net migration in the 103 Italian provinces. Moving from left to right the graphs represents net flows from the North, from the Centre and from the South respectively. In 1972 becomes immediately apparent that almost all of the provinces north of Rome exhibited positive net inflows whereas almost all provinces south of Rome exhibited negative net migration flows (Figure 4.4). In particular, the largest net outflows were exhibited by Rome and Naples, while the largest net inflows were exhibited by the major northern cities such as Milan, Turin, Bologna and Florence.

Figure 4.4 Net Migration Flows by Province in 1972

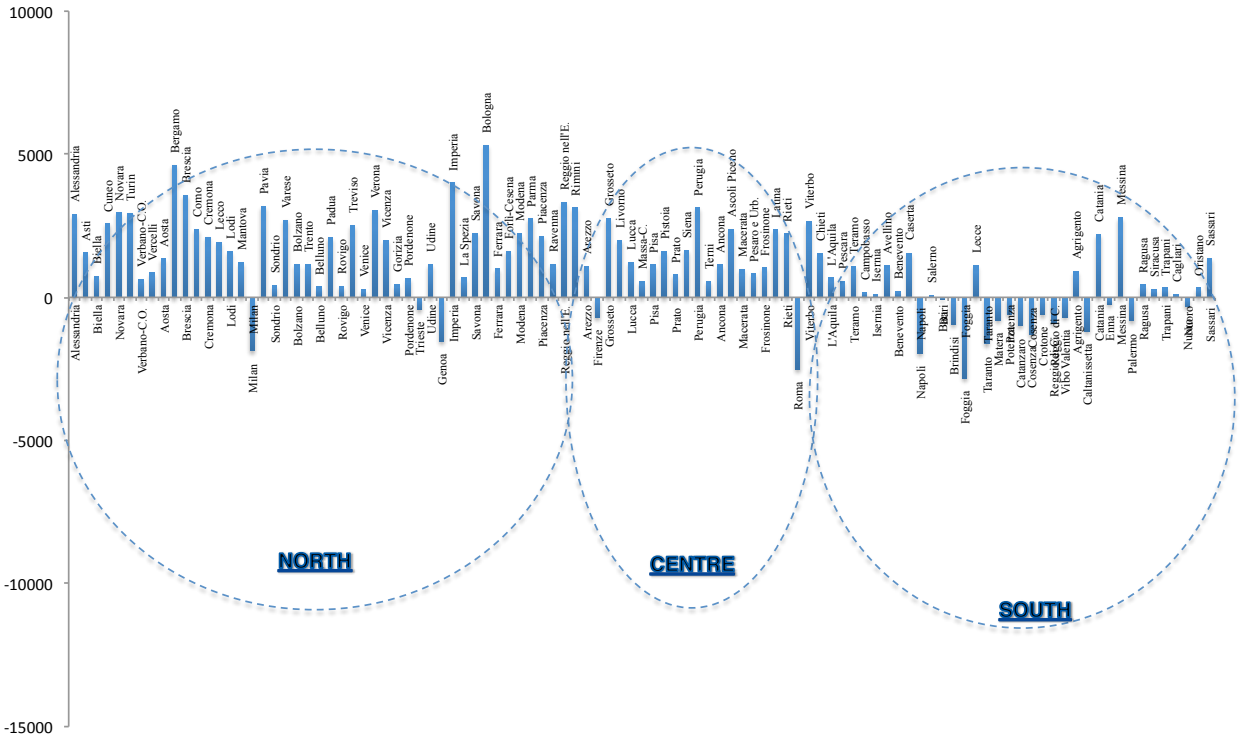


Source: Our elaboration from, Population and Demographic Movements by Municipality, 1972
Note: In the graph are included all type of residential movements (intraprovince; interprovince; interregion).

This pattern of South-North migration greatly attenuated, however, from the mid-1970s onwards. Indeed, between the mid-1970s and mid-1990s, the South–North migration flows slowed down considerably. Figure 4.5, depicts the net migration flows by province in 1992. While the North–South distribution of net migration flows is still similar to that in the earlier era, the absolute levels of these net positive and negative flows are much lower than two decades earlier. Moreover, by this time, some of the major northern cities such as Milan, Genoa and Florence were themselves also experiencing net outflows of people of a similar magnitude to those exhibited by Rome and Naples.

As highlighted before, this pattern of migration between the mid-1970s and mid-1990s (mainly eighties) has been termed the 'empirical puzzle' (Faini et al., 1997), in that while major differences still persisted between high unemployment rates in the South and low unemployment rates in the North, South–North migration rates were surprisingly low and, in particular, much lower than in the previous decades.

Figure 4.5 Net Migration Flows by Province in 1992

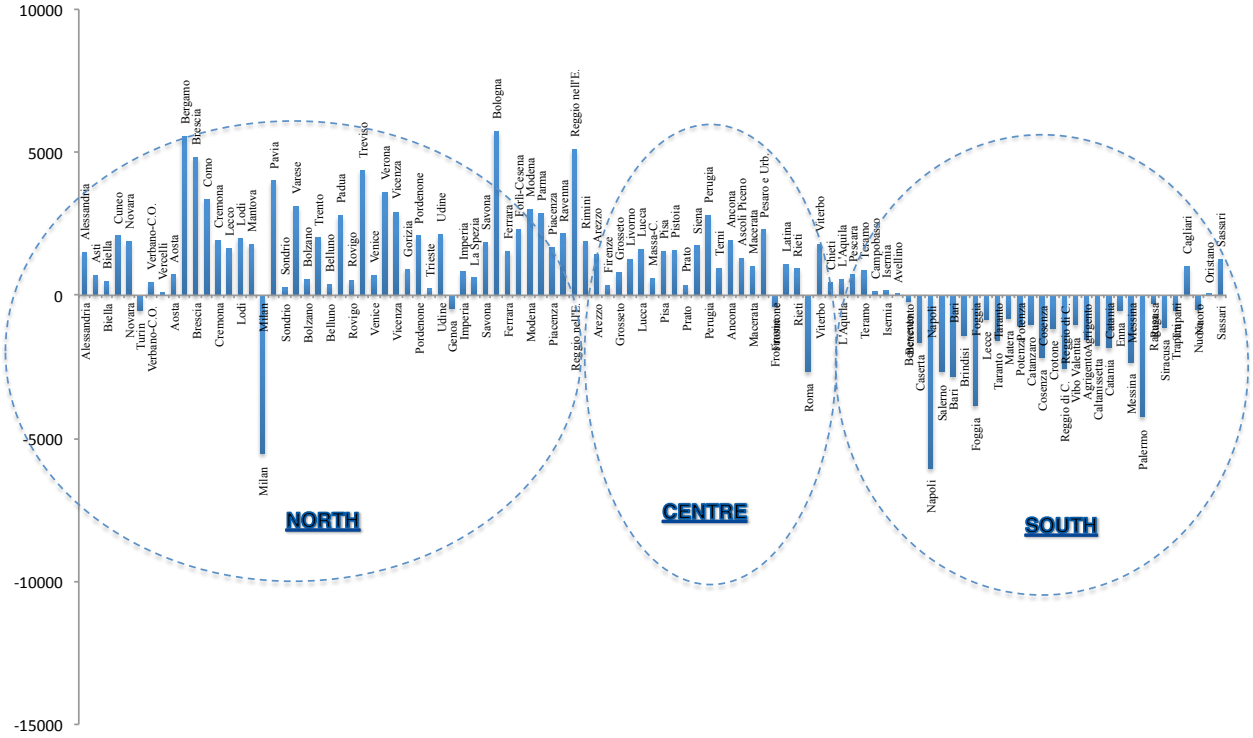


Source: Our elaboration from ISTAT, Population and Demographic Movements by Municipality, 1992
Note: In the graph are included all type of residential movements (intraprovince; interprovince; interregion).

The reasons for this slowdown in migration between are still not entirely clear and various explanations have been put forward, including the role of public sector investment in southern regions (Attanasio and Padoa-Schioppa, 1991), increasing North–South house price differentials (Cannari et al., 2000), growth in absolute living standards in the South (Faini and Venturini, 1994), inefficiencies in interregional job matching processes (Casavola and Sestito, 1993; Faini et al., 1997) and changes in industrial structures and systems (Murat and Paba, 2001). Whatever the reason or mix of reasons for the migration slowdown between the mid-1970s and mid-1990s, between the mid-1990s and the 2000s, Italian South–North migration flows started to recover. Figure 4.6, based on the 2002 migration data, shows that the general South–North migration pattern up to the mid-1970s has reappeared with a vengeance, except for one particular aspect. Net migration outflows from Milan are, along with those from Naples, the largest for any province in Italy. Small net outflows are also observed from other large northern cities such as Genoa and Turin, while many smaller northern cities benefit from large net inflows. Once again, a variety of explanations for this migration turnaround have been offered, including reductions in public sector transfers to the South, the success of northern industrial districts (Basile and Causi, 2005), and the resulting strong northern demand for in-migrant low skilled workers (Bonifazi, 2001) and high skilled workers (Piras, 2005a, b). At the same time as internal Italian explanations are sought, it may be the case that this migration turnaround is also related to external issues. In particular, the increasing disequilibrium interregional labour flows evident since the mid-1990s reflect an emerging pattern of interregional divergence across the European Union (Barca, 2009), driven by increased spatial competition between regions in response to the new era of global competition.

These emerging interregional divergence patterns in the European Union are generally regarded as being related to the complex interactions between agglomeration effects, and the migration behaviour of people with high human capital (Faggian and McCann, 2009b). EU regions characterised by high levels of agglomeration and international connectivity appear to be the major beneficiaries of these market integration and globalisation processes.

Figure 4.6 Net Migration Flows by Province in 2002



Source: Our elaboration from ISTAT, Population and Demographic Movements by Municipality, 2002.
Note: In the graph are included all type of residential movements (intraprovince; interprovince; interregion).

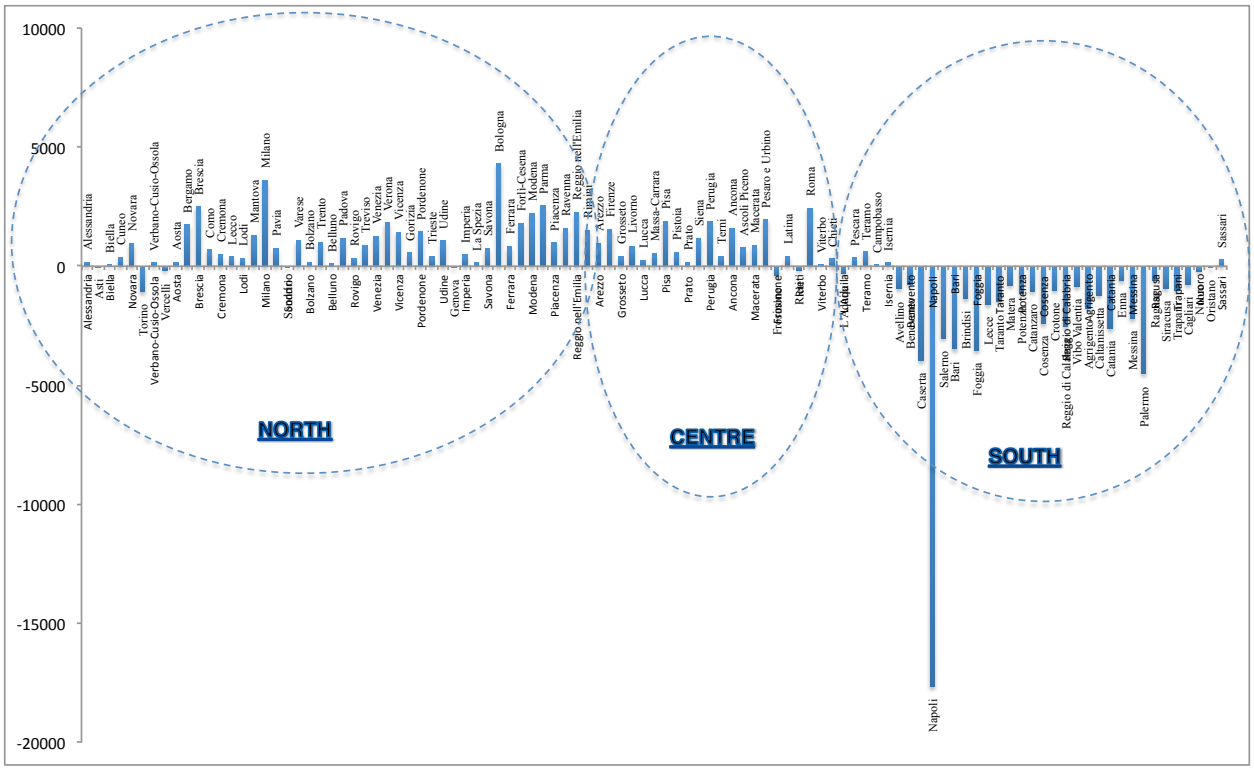
A problem with all of these explanations, however, is that while they provide some possible explanations for the increasing long distance South–North labour drift since the mid-1990s, they provide no explanation as to why smaller cities in the North are systematically growing. Possible clues as to what might be happening can be gleaned from the fact that while the smaller northern cities are growing there are also large net outflows from Milan as well as small outflows from Turin and Genoa. It may well be the case, therefore, that another migration process over shorter distances is operating simultaneously with the long distance South–North labour flows. It is therefore instructive to try to split these two types of migration in order to identify their major characteristics.

4.5 Long and short distance migration

In order to analyse long distance migration movements, we define long distance migration as migration between provinces belonging to non-adjacent macro-regions, that is, migration from the South to the North or from the North to the South. Adopting this approach, as we see in Figure 4.7, net outflows of long distance migrants are almost entirely a phenomenon of provinces in the South.

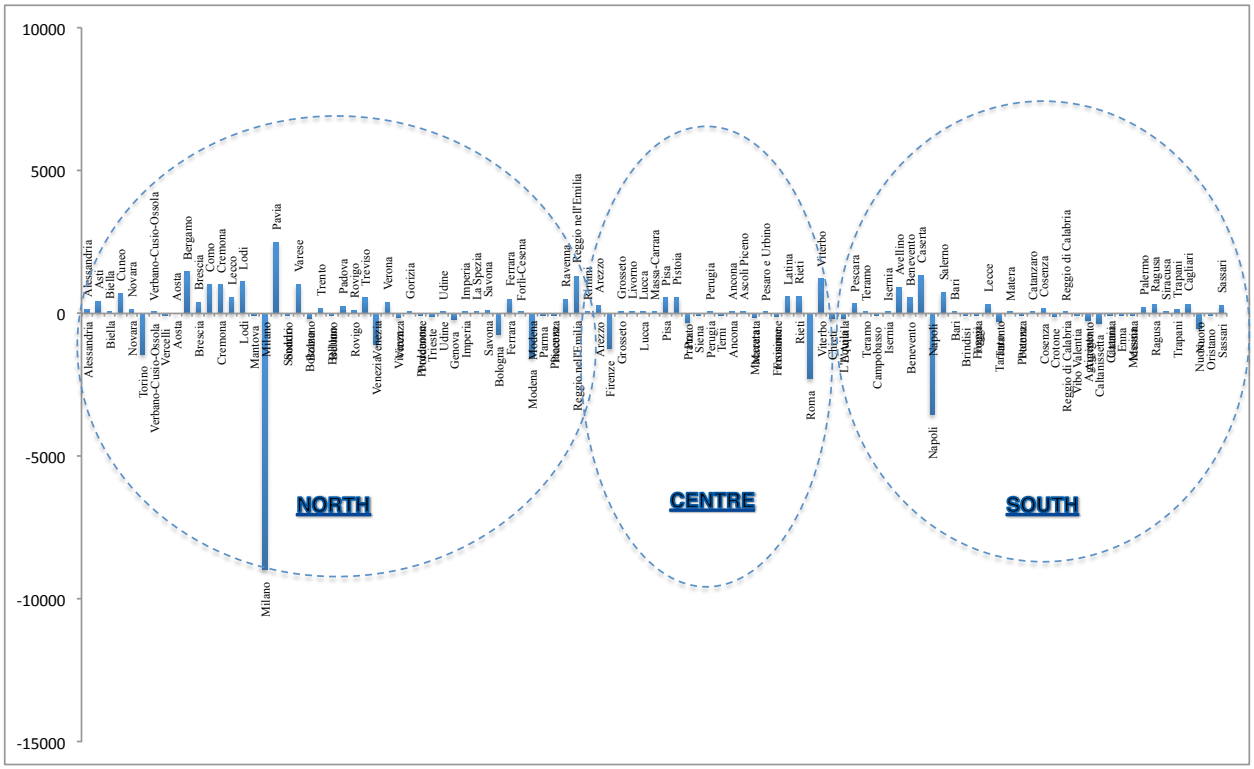
Contrary to long distance movements, short distance movements (i.e. between provinces within the same region) are rather similar for all three northern, central and southern macro-regions (see Figure 4.8). Many large cities appear to suffer net outflows to adjacent provinces whereas smaller cities tend to exhibit net inflows from adjacent provinces. As such, there appears to be an emerging pattern of short distance migration out from some of the large urban areas into some of the smaller urban areas, particularly within the northern region of Italy. Why this should be the case is as yet not clear. The descriptive analysis of Bonifazi and Heins (2000) detects differences in the features of short distance and long distance interprovincial migration in Italy for the time span 1955–1995. However, as yet, there is no real empirical evidence regarding the different features driving the short distance versus long distance migration flows. This work explicitly aims to model these different types of migration flows in order to identify the role played by economic and non-economic factors in determining these complex mobility patterns. This research therefore represents the first time that the key features of short distance versus long distance migration have been modelled so explicitly in the case of Italy.

Figure 4.7. Long Distance Net Migration Flows by Province and Region in 2002



Source: Our elaboration from ISTAT, Migratory movements of resident population, 2006.

Figure 4.8. Short Distance Net Migration Flows by Province and Region in 2002



Source: Our elaboration from ISTAT, Migratory movements of resident population , 2006.
Note: The residential movements between provinces of the three regions (North, Centre and South) are included in the graph.

4.6 Conclusions

The first part of this chapter describes the source and statistical characteristic of the dependent variable in our study of province-to-province migration flow in Italy. The independent variables are grouped into six main categories, with economic, amenity and spatial variables representing the determinants of interests. The second part of the chapter illustrates the evolution of interprovincial migration flows in Italy since the 1970s. It reports a slowdown between the mid-1970s and mid-1990s and a recovery between the mid-1990s and 2000s (mainly South-North migration flows). After decomposing migration for the length of the movements, net outflows of long distance migrants appear almost entirely a phenomenon of provinces in the South; while short distance movements are rather similar for all three northern, central and southern macro-regions of Italy. Many large cities appear to suffer net outflows to adjacent provinces (as detected for the United Kingdom by Fothergill and Gudgin, 1982) whereas smaller cities tend to exhibit net inflows from adjacent provinces. The next chapter is devoted to the empirical applications. Using negative binomials and GMM2S regression, three main models are performed. The first includes all migration flows while the other two analyse drivers of long and short distance migration movement. As explained in the next chapter, long distance movements here are defined as South-North movements of non-adjacent regions while short distance movements are province-to-province movements greater than 70 km, with this threshold set to exclude commuting patterns.

CHAPTER 5

RESULTS OF THE EMPIRICAL APPLICATION

5.1 Introduction

The purpose of the present chapter is to show the results obtained performing the empirical models[48]. As explained in the previous chapters, the purpose of the entire work is to investigate alternative explanations that can reconcile the equilibrium and disequilibrium theories of migration. Specifically, the present study explores whether distance can be seen as an intervening factor that, under certain circumstances (sticky people due to strong territorial identity/attachment and family ties), might change the effect of different types of drivers in the decision to migrate. Therefore, for the case of interregional flows in Italy, the performed models analyse 1) whether equilibrium and disequilibrium migration can be at work simultaneously; and 2) whether the role of drivers changes according to the length of the movements (long versus short distance migration). In Italy, mobility is very low, as even in the presence of high economic disparities the migration rate does not change significantly; conversely, family ties and local attachment are strong, and therefore, it is likely that quality of life depends on the amount of interaction with family and friends. As such, economic variables are expected to play a stronger role to explain long distance migration; the same type of individuals are expected to move short distances to improve their overall quality of life in terms of other types of amenities such as better schools, public services and natural amenities. Short distance migration still allows for strong and frequent contact with family/friends in the region of origin or birth; therefore, it should be motivated mainly by improvements in amenities. The results confirm the initial intuition. Section 5.2 explains the empirical model and the results associated with each of the three performed models using negative binomial estimator (all migration flows, long distance and short distance

[48] This part is partially taken by Biagi et al. (2011).

migration); Section 5.3 shows the outcome of the robustness check of the results using GMM2S and instrumental variables technique. The conclusions are outlined in Section 5.4.

5.2 The empirical model and results

Including the variables described in Section 4.3 of Chapter 4, the general empirical application of the present study becomes

$$M_{ij} = \beta_0 + Distance_{ij} + \Delta GDP_{ij} + \Delta Unemployment_{ij} + \Delta Population_{ij} + \Delta Age\ 20 - 39_{ij} + \Delta Age\ 40 - 64_{ij} + \Delta Age\ 65_{+ij} + \Delta Diploma_{ij} + \Delta Sport_{ij} + \Delta Voters_{ij} + \Delta Family_{ij} + \Delta Crime\ Association_{ij} + \Delta Robberies_{ij} + Mount + Coast + Park + Airport + University \quad (5.1)$$

As specified, three main models are tested. First, all movements are analysed altogether; and second, the flows are decomposed into long and short distance migration to see whether the role of economic and non-economic drivers changes according to the type of flow.

We begin with the analysis of the econometric results in Table 5.1 by considering all migration moves together as if they were a single migration phenomenon. The negative binomial models the log of the expected count, therefore the coefficients indicate how much the log of the count changes if the independent variable varies by one unit. As expected, the level of migration flows is negatively related to the distance between the provinces. However, many of the other results are somewhat difficult to interpret in the light of migration theory as they are not consistent with any of the disequilibrium or equilibrium theories of migration. The economic drivers are highly significant, however only unemployment has the attended sign (*i.e.* the higher the unemployment in destination respect to the origin, the lower is the in-migration in destination); conversely GDP difference – proxy for wages differences- is negative, that is the higher the GDP per capita in destination, the lower is in-migration. It is worth noticing that when

income/earnings/wages and unemployment are put together sometimes one of the two is no significant, less significant or does not have has the attended sign. This feature is highlighted in various studies analysing determinants of migration flows (for a recent review see Greenwood, 2014).

Also the results of the demographic drivers are not straightforward. As highlighted in previous chapters, in gravity models the population in origin and in destination is expected to be positively correlated with bilateral migration flows. However, in the model of Table 5.1 population is highly significant but with negative sign; only the youngest and the older group of population show a positive relationship with in-migration (age 20-39 and +65). The difference in human capital in destination is not significant while the difference in the presence of social capital depends on the type of variables used as a proxy of this driver: *Sport* is positive and significant at 5% level, *Voters* is negative and significant at 5%, crime association is positive and significant at 10%, family capital is not significant. This would mean that in-migration is higher when the possibility to make sport is higher in destination respect to origin and when the association for crime is higher and civic capital à la Putnam (Voters) is lower. The result on the role of sport in attracting migrants is expected but the others are unexpected including also the irrelevance of our proxy for family capital (the variable Family). Among the amenities/disamenities only Coast is not significant. According to this first model individuals would migrate where disamenities such as crime, are lower, where the presence of Universities and airport infrastructure are higher, and where green natural amenities such as parks or mountains are "lower". Overall the results give a mixed picture, as some are in line with what is observed in other empirical work (role of unemployment, sport, and economies of agglomeration) while some others are not (role of GDP, natural amenities and population). One possible interpretation of those results is that a migration model, which includes all types of flows is probably misspecified in that it is likely to mix up quite different migration phenomena. This conclusion is also confirmed by checking the intensity of the 'ancillary parameter' α that measures the degree of dispersion in the predictions. A parameter higher than one (1.6 in this case) indicates that the overdispersion is still very high (as specified in Chapter 3, conversely

a parameter equal to zero indicates no overdispersion and the negative binomial reduces to a Poisson).

Following the main argument of this work, it is likely that different drivers push short and long distance migration flows. Therefore, in order to test this hypothesis the next step is to split the two different types of migration flows. Considering just the long distance flows (Table 5.2), migration appears to follow the logic of the disequilibrium model, where economic and labour market variables play a dominant role. It is worth noting that the alpha parameter is now lower than one; it means that the results of the present model are more reliable. Table 5.2 indicates that people migrating long distance tend to choose provinces with higher gross domestic product (GDP) per capita and lower unemployment rates, and this time both indicators have the attended sign. Also population has the positive attended sign in line with gravity model theory. Additionally, the positive effect on the 20–39 age group in attracting long distance migrants is confirmed. Therefore, the urban to rural Fothergill and Gudgin (1982) effect seems not to work in case of long distance migration in Italy. Furthermore, the results indicate that for long distance movements human capital plays a role. This is consistent with the finding that in many countries, the age cohort 20-39 is the most migratory group in response to wage signals. The same is found for high human capital individuals. Recent estimates suggest that migrants of this age group with high human capital contribute as much as 80% of the value-added in the economy (McDonald and Temple, 2006). Provinces with a local university and with a better-educated population (human capital) are also favoured.

In terms of social and amenity factors, long distance migration is negatively related to crime levels but surprisingly unrelated (or even negatively related, in the case of natural parks) to natural amenities, showing that in long distance movements economic variables play an important role together with urban agglomeration economies (proxied by the presence of airports and/or universities). As in the previous model, family capital is not significant even though the sign turns to be negative as expected *(i.e.* the lower the families ties, the higher the in-migration rate). It is likely that the chosen index of family capital is not suitable as a measure of the strength of family ties. On the contrary,

the variable sport is highly positive and significant (from 5% of the previous model to 1% in this model) and confirms the role of this variable in attracting migrants. Also crime association is more significant (from 10% to 1%); however this time – and more in line with the expectations – the sign turns out to be negative (*i.e.* negative social capital discourages migration).

The results are different for short distance migration (Table 5.3). Short distance province-to-province movements may also include commuting patterns. In order to exclude those, we consider only short distance movements greater than 70 km. This threshold distance allows us to exclude most commuting patterns. Taking for instance the case of the largest city in Italy, Milan: many people working in Milan live in the surrounding cities where quality of life is higher and house prices lower. However, the distance between Milan and the closest neighbouring cities (such as Pavia, Lecco and Como) is much shorter than 70 km. Pavia is only 38 km away, Lecco 55 km and Como 49 km. Therefore, reducing the dataset to include only migration flows between provinces in close proximity, migration data for flows between closer provinces short distance migration seems primarily directed towards relatively smaller provinces with better quality of life and amenities play a stronger role. Among the economic drivers, unemployment is still significant and with the attended sign but the intensity is lower than long distance migration; additionally, differences in GDP appear not important. Population is strongly significant but negative, as in the first model: it is like that for short distance migration higher agglomerations are seen as disamenities. Other demographic, human capital and social capital variables do not play a role. However, it is worth noting that family capital –even though not significant- changes sign and becomes positive as hypothesised in this work. As such, it seems that for short distance migrants the higher the family capital, the higher the migration flows. Of course this represents only a tiny step forward because the variable is not significant, however, it is enough to suggest the need to further investigate the role of "family ties" in migration flows. Moreover, living close to the coast is a pull factor for short distance migrants; in fact, coast seems to be the strongest after the presence of an airport or the presence of a university.

In conclusion, the results of this work suggest that long distance migration in Italy is driven mainly by economic determinants whereas in short distance migration people place more weight on quality of life and amenities differences between origin and destination locations.

Table 5.1. Model 1: All Migration Flows (Observations: 10,506)

Dependent Variable: Flows from I to j. All type of flows				
Observations: 10,506	**Model 1**			
	NEGBIN		**GMM2S**	
Spatial driver	**Coefficient**	**z-value**	**Coefficient**	**z-value**
Distance (km)	-.0011162***	-18.16	-0.0630202***	-9.54
Economic drivers				
ΔGDP	-0.0000249***	-2.81	-0.0113712	-1.29
ΔUnemployment	-.0378185***	-10.92	-5.786221	-1.54
Demographic drivers				
ΔPopulation	-3.96e-07***	-11.30	-0.00002*	-1.88
Δ Age 20–39	.1238887***	4.03	11.69332*	1.87
Δ Age 40–64	-.0031304	0.875	-3.498143*	-1.85
Δ Age 65+	.049727***	2.67	3.248658	1.3
Human Capital drivers				
ΔDiploma	.0000999	0.319	0.0289068	1.6
Social Capital				
Δ Sport	0.0000231**	2.29	-0.0007081	-1.47
Δ Voters	-0.006535**	-2.11	0.2171659	0.6
Δ Family	0.3258526	0.95	-169.2435**	-1.98
Δ Crime Association	0.1326505*	1.85	19.26309	1.14
Amenities and Disamenities drivers				
Δ Robberies	-0.0004609***	-2.97	0.0020553	0.06
Mount	-0.2057038***	-3.12	-9.156162**	-2.12
Coast	0.014834	0.27	-6.410066*	-1.67
Park	-0.3056038***	-6.99	-13.48975**	-2.19
Airport	2.077884***	26.63	127.6323***	12.12
Universities	0.6723612***	15.56	28.81049***	4.13
Alpha	*1.569407*		-	
GLM statistics (alpha constant)				-
(1/df) Deviance	*1.183714*		-	-
(1/df) Person	*2.441141*		-	-
AIC	*8.746894*		-	-
BIC	*-84692.88*		-	-

Note: P-values are in parentheses: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.
The models are performed with robust standard errors. Heterogeneity parameter a is calculated by the NB estimator. Following Hilbe (2007) Deviance, Pearson and AIC and BIC are calculated performing a GLM in which the heterogeneity parameter a of the negative binomial is held as constant. The diagnostic test for instrumental variables/GMM is taken from Baum et al. (2007).

Diagnostic Tests GMM2S: Model 1 All migration flows	
Endogeneity test (ΔGDP, ΔUnemployment)	*3.094 (P=0.2128)*
$H_{0:}$ Exogeneity	*No Reject H_0*
Kleibergen-Paap rk LM statistic (underidentification test)	*94.49 (P=0.0000)*
Kleibergen-Paap rk Wald statistic (underidentification test)	*97.64 (P=0.0000)*
$H_{0:}$ Underidentification	*Reject H_0*
Kleibergen-Paap Wald rk F statistic (weak identification)	*32.49*
Anderson-Rubin Wald test (weak instruments)	*4.77 P=0.1897*
Stock-Wright LM S statistic (weak instruments)	*4.76 P=0.1901*
$H_{0:}$ B1=0 and overidentifying restrictions are valid	*No Reject H_0*

Table 5.2. Model 2: Long Distance Movements (Observations: 1,656)

Dependent Variable: Flows from i to j. Long distance flows				
Observations: 1,656	**Model 1**			
	NEGBIN		**GMM2S**	
Spatial driver	**Coefficient**	**z-value**	**Coefficient**	**z-value**
Distance (km)	-0.0009324***	-5	-0.0706764***	-2.53
Economic drivers				
ΔGDP	0.0000523***	3.57	0.0141581***	3.04
ΔUnemployment	-0.0674677***	-12.38	-2.562027***	-2.11
Demographic drivers				
ΔPopulation	-0.000000268***	-5.4	-0.0000249***	-2.54
Δ Age 20–39	0.1227406***	2.33	18.90813***	3.39
Δ Age 40–64	-0.0501946*	-1.79	9.154438***	3.38
Δ Age 65+	0.0746377***	2.49	2.260502	0.72
Human Capital drivers				
ΔDiploma	0.0002484***	1.59	-0.0472251**	-2.19
Social Capital				
Δ Sport	0.0000685***	3.98	-0.0050164***	-2.84
Δ Voters	-0.0003819	-0.08	-1.8024***	-2.96
Δ Family	-0.1750573	-0.26	-345.8513***	-4.17
Δ Crime Association	-0.3111465***	-2.88	3.725964	0.53
Amenities and Disamenities drivers				
Δ Robberies	-0.0002403	-1.03	-0.1237895***	-4.5
Mount	-0.0671771	-0.89	-23.58605***	-3.12
Coast	-0.5216373***	-6.32	-24.48861***	-3.35
Park	-0.1286889*	-1.76	10.2386	1.31
Airport	1.783026***	10.98	113.2721***	7
Universities	0.6602752***	11.69	22.71503***	4.66
Alpha	*.8450706*		-	
GLM statistics (alpha constant)				
(1/df) Deviance	*1.137341*	-	-	-
(1/df) Person	*1.196408*	-	-	-
AIC	*9.100376*	-	-	-
BIC	*-10271.88*			

Note: P-values are in parentheses: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.
The models are performed with robust standard errors. Heterogeneity parameter *a* is calculated by the NB estimator. Following Hilbe (2007), Deviance, Pearson and AIC and BIC are calculated performing a GLM in which the heterogeneity parameter *a* of the negative binomial is held as constant. The diagnostic test for instrumental variables/GMM is taken from Baum et al. (2007).

Diagnostic Tests: Model 2 Long distance flows	
Endogeneity test (ΔGDP, ΔUnemployment)	*3.854 P=0.1455*
$H_{0:}$ Exogeneity	*No Reject H_0*
Kleibergen-Paap rk LM statistic (underidentification test)	*58.82 P=0.0000*
Kleibergen-Paap rk Wald statistic (underidentification test)	*64.85 P=0.0000*
$H_{0:}$ Underidentification	*Reject H_0*
Kleibergen-Paap Wald rk F statistic (weak identification)	*21.35*
Anderson-Rubin Wald test (weak instruments)	*34.19 P=0.0000*
Stock-Wright LM S statistic (weak instruments)	*33.38 P=0.0000*
$H_{0:}$ B1=0 and overidentifying restrictions are valid	*Reject H_0*

Table 5.3. Model 3 Short Distance Movements (Observations: 371)

Dependent Variable: Flows from i to j. Short distance flows (> 70 Km)				
Observations: 371	**Model 1**			
	NEGBIN		**GMM2S**	
Spatial drivers	**Coefficient**	**z-value**	**Coefficient**	**z-value**
Distance (km)	-0.0152919***	0.0012765	-1.844694***	-5.54
Economic drivers				
ΔGDP	-0.00000861	0.0000239	-0.0086914	-0.5
ΔUnemployment	-0.041598***	0.0119756	-14.24439	-1.68
Demographic drivers				
ΔPopulation	-0.000000462***	9.87E-08	-0.0001028	-1.5
Δ Age 20–39	0.0817562	0.1106718	-6.957033	-0.25
Δ Age 40–64	-0.0459769	0.0844377	-11.95772	-0.6
Δ Age 65+	0.0773777	0.0633169	-2.128331	-0.14
Human Capital drivers				
ΔDiploma	-0.0000225	0.0003801	0.0218115	0.24
Social Capital				
Δ Sport	0.0000313	0.0000323	-0.0015016	-0.23
Δ Voters	-0.0116785	0.0107393	1.669981	0.53
Δ Family	0.9859238	1.840579	-155.8315	-0.43
Δ Crime Association	0.0772945	0.2148222	16.44736	0.29
Amenities and Disamenities drivers				
Δ Robberies	-0.0000575	0.0004078	-0.0451345	-0.52
Mount	0.2842666	0.2113471	65.06074	1.44
Coast	0.7804133***	0.140335	84.06662**	2.29
Park	-0.1066664	0.132106	22.80866	0.65
Airport	2.339249***	0.3152418	399.997***	5.13
Universities	0.9229345***	0.1158631	103.9731***	3.17
Alpha	*.7806029*		-	
GLM statistics (alpha constant)				
(1/df) Deviance	*1.164091*	-	-	-
(1/df) Person	*1.55508*	-	-	-
AIC	*10.75348*	-	-	-
BIC	*-1672.743*			

Note: P-values are in parentheses: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.
The models are performed with robust standard errors. Heterogeneity parameter *a* is calculated by the NB estimator. Following Hilbe (2007), Deviance, Pearson and AIC and BIC are calculated performing a GLM in which the heterogeneity parameter *a* of the negative binomial is held as constant. The diagnostic test for instrumental variables/GMM is taken from Baum et al. (2007).

Diagnostic Tests GMM2S: Model 3 Short distance flows	
Endogeneity test (ΔGDP, ΔUnemployment)	*1.422 P = 0.4911*
H_0: Exogeneity	*No Reject H_0*
Kleibergen-Paap rk LM statistic (underidentification test)	*25.59 P=0.0000*
Kleibergen-Paap rk Wald statistic (underidentification test)	*38.48 P=0.0000*
H_0: Underidentification	*Reject H_0*
Kleibergen-Paap Wald rk F statistic (weak identification)	*12.13*
Anderson-Rubin Wald test (weak instruments)	*3.13 P=0.3726*
Stock-Wright LM S statistic (weak instruments)	*3.10 P=0.3763*
H_0: B1=0 and overidentifying restrictions are valid	*No Reject H_0*

5.3 Robust check and endogeneity problems

The economic variables included in the model (GDP and unemployment rate) are all suspected of endogeneity and need to be instrumented for. Therefore, as explained in Chapter 3, we use instrumental variable technique, a two-stage Generalized Method of Moments (GMM2S) robust estimator and the routines and tests presented in Baum et al. (2007). We use three different instruments. The first instrument is the performance of the football teams in the destination province. The underlying hypothesis is that the performance of a football team is related to the previous investments made by the team and, *a fortiori*, to the economic wealth of the province. The link between the performance and the quality of management of soccer societies has already been demonstrated in the empirical literature on sport economics (Frick and Simmons, 2008; Forrest et al., 2010). It should be noted that the performance of the football team itself does not influence the decision of people to migrate to a particular province. In order to build the instrumental variables to proxy the wealth of a province, we collect the ranking of the four professional football leagues in Italy, namely, 'Serie A' (Premier League), 'Serie B', 'C1', 'C2' and one non-professional league 'Dilettanti'. In total, we count 92 positions in the rank (the first 18 are in 'Serie A', between 19–38 are in 'Serie B', and so on). We give 92 points to the first team in 'Serie A', 91 to the second, 90 to the third, and so on; we then sum all the points for the teams belonging to the same province. This calculation is done for the championships in the years 1994, 1995, 1996, 1997, 1998

and 1999, with the final variable (Football) being the average performance of each province in the time span 1994–1999.

The second instrument is the 'industry mix employment rate' in the style of Bartik (1991) and Blanchard and Katz (1992). The index for a province '*s*' in the period (*t*, *t+n*) is defined as:

$$INDMIX_s = \Sigma_{is}^{t} * EMP_{GR_i,ITA}^{t,t+n} \quad (5.2)$$

where $\Sigma_{is}^{t}\Sigma_{\mathrm{is}}^{\mathrm{t}}$ is the province's employment share in industry i (one-digit SIC[49]) in the initial year *t* (in this case 1991) and $EMP_{GR_i,ITA}^{t,t+n}$ is the growth rate in industry i for the whole of Italy in the period *t*, *t+n* (in this case 1991–2001). In practice, the index measures the hypothetical employment growth rate if the province grew at the national level over the time span under analysis. In this case, therefore, changes in national industry are the exogenous shifters (Faggian et al., 2010).

The number of ATM machines per 10,000 inhabitants in 1996 represents the third instrument, which is exogenous with respect to migration flows in 2001, but highly correlated to the level of per capita GDP.

The instrumental variables estimation is performed using the Stata command 'ivreg2' and 'GMM2S robust' to account for heteroskedasticity (Baum et al., 2007). The endogeneity tests (see bottom of Tables 5.1, 5.2, and 5.3), fail to reject the null hypothesis that the economic regressors may be treated as exogenous. In other words, endogeneity does not seem to be a major problem in our estimations. However, we still report both results with and without correction for endogeneity.

It is worth noting that while GMM corrects for endogeneity, it does not do it for overdispersion and heterogeneity of data; conversely, the negative binomial with GLS corrections does. Overdispersion and heterogeneity problems become apparent by looking at the magnitude of the coefficients of the second column of Tables 5.1-2-3. Therefore, the GMM results need to be taken with cautions. However, some results are confirmed and some others are new and somehow encouraging. When the flows are

[49] SIC stands for Standard Industrial Classification Code. For a list of the codes see http://www.abag.ca.gov/abag/overview/datacenter/jobs/sic_cbp.html.

analysed together (second column of Table 5.1), what we observe is that (a) distance maintains its importance in discouraging migration, (b) the economic drivers are not significant anymore; and (c) population is still negative (the only difference is that also the second cohort of age becomes significant and negative). Among the social capital drivers only family capital is significant and has the attended sign, indicating that, on average, family ties discourage migration. Among the amenities, crime is not significant anymore while the other variables are highly significant and have the same sign of the first column; moreover also Coast is now significant and negative like Mount and Parks. In long distance migration (second column Table 5.2), the effect of economic variables is confirmed; among demographic variables, population as a whole is now negative and two age cohorts are positive: 20-39 and 40-64. Human capital is significant but negative; this result in not in line with that of the first column and with findings of other empirical works in the literature. Interestingly, all social capital variables - except Crime Association - are significant and have a negative signs. This result would confirm the effect of economic drivers in long distance migration and the role of family in discouraging migrants. Moreover, as before, natural amenities do not seem to influence long distance migration decisions, while the presence of airport infrastructure and universities appear to play a role.

When employing the GMM model to analyse short distance migration, the variables that remain significant and have the attended sign are Distance, Coast, Airport and Universities. These results confirm the importance of amenities in explaining this type of migration.

Overall findings are encouraging even though the effect of family capital on migration flows is not well defined. One possible explanation is that the built index is not a good proxy of the strength of ties.

5.4 Conclusions

Migration in Italy is consistent with the idea that long distance migration responds to increases in income and unemployment while short distance movements are more

responsive to amenities. These results can be interpreted as the first evidence that confirms this intuition. As explained in Chapters 1 and 2, a previous study on EU countries by Cheshire and Magrini (2006) finds that migration among European countries is driven mainly by economic factors, thus attributing disequilibrium migration to Europe. The same work hypothesises that equilibrium migration might work within European countries when cultural, economic and institutional differences are less sharp. However, the findings of the present study demonstrate that equilibrium and disequilibrium migration might take place simultaneously even within a country. This work obtains clear pointers that such a hypothesis could be valid for the Italian case. As seen in Chapter 4, Italy has a specific case of historic dualism between the richer northern part of the country and the poorer southern part. However, we believe that further research is needed on whether equilibrium and disequilibrium can exist at the same time. The role of place-attachment could be particularly strong for Mediterranean countries: that is, for individuals to live far away from family and friends they should have stronger economic incentives.

FINAL CONCLUSIONS AND FURTHER DEVELOPMENTS

The study focused on neoclassical regional models of migration and precisely, on so-called disequilibrium and equilibrium models and the role of distance as an intervening factor. After reviewing the recent empirical evidence on the United States and Europe, three main questions arose: 1) Can we definitively say that the equilibrium versus disequilibrium debate is over?; 2) Could alternative explanations reconcile the equilibrium and disequilibrium theories of migration?; and 3) Why is the job versus amenities question still so important and what are the implications for regional policies?

As seen in this work, the debate is not as intense today as in the past but the question nevertheless remains unsolved. Studies on interregional migration are still divided into urban studies quoting equilibrium literature à la Graves; regional studies quoting disequilibrium literature à la Greenwood and papers quoting both types of literature without considering the problems of the implications of the two approaches. Furthermore, the evidence does not provide indisputable results about one or the other type of approach; therefore, the question whether equilibrium over disequilibrium drivers prevail in developed countries is far from settled. However, it is likely that both types of drivers can play a role for people in diverse circumstances both within countries and in different countries.

The perspective of this study is that the evidence from different countries suggests that the relative weight of the different types of drivers is very much related to individual preferences that depend also on cultural or social characteristics that are place or country-specific. In some countries, individuals tend to live close to their family and friends, and such behaviour may affect attitudes toward migration by increasing the psychological cost of migration. The role of place-identity or family attachment and the effect of cultural factors on migration attitudes is understudied and probably underestimated.

Although many papers have debated the disequilibrium versus equilibrium migration models, not many contributions have highlighted that these two models might, in fact, be

two sides of the same coin and are not totally irreconcilable. The length of the movement (distance) is strongly linked to territorial identities and family ties and to the relative impact of equilibrium and disequilibrium variables in migration behaviour. The present work investigates whether distance can be seen as an intervening factor that, under certain conditions (sticky people due to strong territorial identity and family ties), affect the weight of different types of drivers in the decision to migrate. Specifically, we believe that in countries where people are sticky due to strong territorial attachment or family ties, it is likely that they migrate long distances mostly to gain economic improvements, that is they consider the possibility of living far away from their regions of origins only to gain economic returns; and such economic returns have to be high to cover the psychological costs of displacement. For those types of individuals, quality of life depends mostly on the amount of their interactions with family and friends. The same type of individuals are expected to move short distances to improve their overall quality of life in terms of other types of amenities such as better schools, public services and natural amenities. Short distance migration that still allows for strong and frequent contact with family and friends is driven by improvements in other types of amenities such as schools and urban amenities in general. In this case, amenities are expected to be empirically stronger than economic variables as a driver of migration.

For the case of Italy, findings confirm that long distance movements from the poorer more rural South to the more industrialised richer North might be predominantly the result of differences in economic opportunities, while the more recent short movements from large cities to their hinterland or to smaller neighbouring provinces might be partially motivated by the search for a better quality of life (in public and private services).

This work provides some initial evidence that long distance migration between Italian provinces better conforms to the expectations of a disequilibrium model of migration, while in contrast short distance movements between adjacent cities show some features of the equilibrium model of migration. The results are confirmed after controlling for different specifications and robust checks. As such, any migration model attempting to account for Italian interregional mobility patterns will be mis-specified because the

underlying processes of these two simultaneously operating migration systems are very different. Moreover, the obtained results also differ markedly from those suggested by Cheshire and Magrini (disequilibrium drivers explain interregional migration among European countries; 2006) and by Rodriguez-Pose and Ketterer (equilibrium drivers are the most important for interregional migration among European countries; 2012) but they differ also from findings based on recent US studies (stronger role of equilibrium drivers for internal migrants).

Our observations suggest that natural amenity-driven migration in Italy operates only within the same region, not at the level of the country as a whole.

As far as we are aware, this is the first time that the different types of simultaneously-operating short distance and long distance interregional migration flows have been decomposed and analysed for a country in this particular way, and it will be instructive to identify whether the patterns uncovered in Italy are reflected also in other countries. As a consequence, further research on this topic is needed.

This research has policy implications as urban and regional economists debate appropriate policy interventions for regional development. In equilibrium models, migration reacts very fast to exogenous changes. As such, any type of local policy will probably be unsuccessful because wages and housing markets quickly compensate for the difference. For this approach, place-based policies are needed only when frictions hamper migration or compensation. In disequilibrium models, adjustments take a very long time anyway, and the presence of frictions makes policies essential to increase individual utilities and to encourage local growth.

Regarding place-based policies, the debate is a well-known ‘chicken-egg’ question of whether it is better to attract firms first, or labour first. If people follow jobs, regional and local policies should target firms; conversely, if jobs follow people regional and local policies should target individuals. Regional policies have higher direct costs and need time to be implemented; therefore, any mistake not only makes the policy ineffective, but also can be very expensive in terms of opportunity costs. The debate is still not settled (Partridge and Rickman, 2003). The present work investigates the hypothesis

that under certain circumstances, people follow jobs while in others, people follow amenities. If so, place-based policy should have different targets.

Looking exclusively at the internal reallocation of individuals, the obtained results for the case of Italy suggest that policies attracting firms would internally pull mainly long distance interregional movements, and then not many, as individuals are sticky due to high territorial attachment or strong family ties. Conversely, policies based on amenities would attract people moving shorter distances (mainly neighbouring provinces or regions). However, if firms (or local governments) aim to attract individuals with high human capital from other internal territories as the literature suggests, then locally provided urban amenities could probably play a stronger role. However, it is possible that in regions where people are sticky, policies targeting human capital will attract mainly short distance migration or maybe international migrants. Unfortunately, this last hypothesis cannot be investigated in the present study because the origin-destination matrix of migration data at a provincial level aggregates all flows together. Furthermore, it is essential to explore interprovincial migration in Italy by human capital composition of the flows to see whether such results hold for any type of movers or whether, following Glaeser et al. (2001) and Florida (2002), individuals with high human capital are attracted to urban amenities rather than natural amenities. This issue can be explored investigating Italian interprovincial flows by human capital context and this presents one of the main opportunities for further research as a result of this study.

To sum up, the findings of the present work confirm the set hypothesis, even though the effect of family capital does not appear as straightforward as initially hypothesised. One possible explanation is that the built index needs to be improved in order to better capture the strength of family ties. Furthermore, dealing with cross-section-type data does not allow analysing whether the results are confirmed over a longer time span. This would be possible by utilising panel data and techniques and dynamic models. The latter would also allow examining the role of *beaten path* or *chain migration*; however, this would mean dealing with 10,506 observations per year, causing problems of invariant variables (such as for instance distance).

Despite the abovementioned *caveats*, the obtained results are definitely encouraging and suggest that the issue of what (differentially) drives long and short distance migration requires further investigation – in particular in the case of countries with a very heterogeneous regional context, both from a socio-economic and - most importantly - cultural point of view.

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