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"Internal migration in Italy in recent years: a top-down approach"

Supervisor:
Chiar.mo Prof.
Salvatore Strozza

Co-supervisor:
Chiar.mo Prof.
Oliviero Casacchia

Coordinator:
Chiar.ma Prof.ssa
Elisabetta Barbi

Author:
Alessio Buonomo

Department of Statistical Science
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Why do they move?
Characteristics and determinants of internal mobility in italy

List of acronyms and annotations

Variables	**Acronyms**
All the Macroregions[a]	.
Number of years lived in the age interval	a
Place of birth	b
Birth	B
Deaths	D
Deaths of the life table	d
Distance between two regions[b]	DS
Life expectancy	e
Specific emigration rate	er
Internal and international migration flows	F
Number of changes of residence from the region i to the region j by place of birth[b]	${}^{b}F_{ij}$
Number of changes of residence from the region i to the region j[b]	F_{ij}
Gross domestic product per capita[b]	GDP
Region of origin of migration[c]	i
Region of destionation of migration	j
Second Macroregion of destination[a]	k
The number surviving to the beginning of the age interval	l
Total number of years lived	L
Specific mortality rates	m
Generic number of years[a]	n
Population	P
Provisional Population	$\widetilde{P}$
Average population	$\overline{P}$
Residents born in the same region as those who migrate[b]	${}^{b}P$
Qualitative explanatory variable that correspond to the migrants' place of birth[b]	${}^{b}PB$
Probability of emigrating	p
Probabilities of death	q
Region of residence[c]	r
Sex	s
Cumulative sum of the total number of years lived	T
Year of the event (time)	t (left subcript)
Year of birth (cohort)	t (right subcript)
Age	x
Age after the migration[a]	(x) and (y)
Final age class[a]	ω

Variables	**Annotations**
Those who were not born in Italy	Born abroad
Those who reside in a different region (or Macroregion) than the one in which they were born	Born in another region (or Macroregion)
Region (or Macroregion) where the migration flows ends	Destination
Those who reside in the region (or Macroregion) in which they were born	Natives
Those who reside in a region (or Macroregion) other than the region (or Macroregion) of birth	Non-natives
Region (or Macroregion) where the migration flows starts[d]	Origin
Individuals born in one of each 20 Italian region and individuals born abroad[d]	Place of birth

[a] We use this annotation only in chapter 2.
[b] We use this annotation only in chapter 3.
[c] In chapter 2 (unlike the annotations used in the rest of the thesis) the region of residence (r) is equal to the region of origin of internal emigration (r = i).
[d] In the whole thesis, the region of origin is never the birthplace. We will refer to the birthplace using the annotation "place of birth".

INTRODUCTION

Internal migration has played a key role in determining the physiognomy of Italy in the post-war period (Golini 1974; Rees et al. 1998; Golini 1999). The most intense emigration from the South (traditionally the poorest area of the peninsula) to the richest regions of the Centre-north (Baldi and Cagiano de Azevedo 1999; Pugliese 2002) took place in the twenty years between 1955 and 1975 (Bonaguidi 1987). The internal migration flows are important and necessary to properly describe the economic and political phenomena during those years (Bonifazi 2013a). In the 1970s and 1980s, there was a reduction in interregional migration flows (Di Comite 1992; Piras and Melis 2007). As a result, scholars began to focus more on international migration flows and neglected the internal ones (Pugliese 2011). However, since the nineties internal migration has regained importance (Matinotti 1993; Bonifazi 1999).

In recent years, foreigners have played a key role in internal migration in Italy. In the last two decades, the number of foreigners living in Italy has increased rapidly from 350,000 residents surveyed in 1991 to nearly 5 million according to the Population Registers data at the beginning of 2014. This increase has obviously had an impact on internal migration (both between municipalities and between regions) (de Filippo and Strozza 2011). An increase of immigrant residents and the amount of internal migration are certainly linked together: a large part of the growing number of residence transfers is in fact due to the internal migration of foreign citizens (Casacchia et al. 2010; Bonifazi and Heins 2017). In the last decade, the internal migration of Italians, while continuing to represent most internal migrations, has decreased in relative terms from over 91% in 2002 to 82% in 2012 (Population Registers data) in favour of that of foreigners. Internal migration of foreigners has significantly increased both in absolute terms (from 108,611 to 279,387 changes of residence between 2002 and 2012), and in relative terms (from less than 9% in 2002 to 18% in 2012) (Cantalini and Valentini 2012). Better indicators, such as intra-regional and interregional emigration rates by ages, and furthermore total emigration rates, allow for a comparison of the migration propensity of foreigners and Italians. Thus, migration patterns initially were very differently, but, especially since 2008 and onwards, they tend to be more similar, partly as consequence of the economic crisis and partly because of a more stable foreign presence (Bonifazi, Heins and Tucci 2012).

Although the mean age of foreigners is lower than the national population, the increase in their presence has not been enough to prevent the ageing process of the overall resident population in Italy in recent years (ISTAT 2017). It is well-known that the tendency to migrate is generally high among the middle-aged and decreases in later years, although the age of retirement is generally characterised by a slight increase in internal migration flows followed by a further decline (Rogers and Castro 1981; Wilson 2014). In this way, the ageing process of the population in Italy has led to a containment of internal migration flows and an increase in the mean age of those who migrate (Bonifazi, Heins and Tucci 2012). Another factor that lowered the internal migration level was the recent economic crisis which, in particular in 2009, led to a drastic reduction in internal migration flows (Bonifazi 2013b; Impicciatore and Strozza 2015). However, during the years of the crisis, the increase in migration flows from the Centre-north to the South led to the opposite outcome (Bonifazi and Heins 2017).

A new phenomenon of internal migration over the last twenty years has been the growing attraction of the Northeast (ISTAT 2014). There have been two aspects in determining this new characteristic of internal migration in Italy: the growth of small industries in the territory (since the mid-1990s) and the ability to attract young people from the South for education reasons (Svimez 2010; Bubbico, Morlicchio and Rebeggiani 2011). Another novel element is the migration of young people around the age of 20 (Livi Bacci 2008), especially for education purposes (Piras 2007), with the consequent brain drain of the most qualified people from the South (the poorest area) towards the Centre-north (richer area) and abroad (Scicchitano and Guarino 2008; Pugliese 2011). The migration from the South, however, not only concerns the most qualified population; in fact, small and medium-sized industries, the construction sector and the public sector continue to attract large migration flows (Panichella 2014). However, the population from the South has had to increasingly deal with a general decline in the standard of living of the middle class in the Centre-north; this has created difficulties with employment (Impicciatore and Tuorto, 2011) and encouraged short-range migrations (Cantalini and Valentini 2012).

The migratory behaviour of women too has changed very much since the post-war years. Until the 1980s, long-range migration (between regions and between Macroregions[1]) were predominately male. Primarily, men moved seeking employment. Women often remained in their region of origin and only followed their partner if the latter was able to find a stable job (Bertolini 2014). Female internal migration has adopted a different pattern in recent years. Women are gradually filling the gender gap (Bonifazi, Heins and Tucci 2012). Many factors have contributed to this result. On the one hand, among residents born abroad, females have a higher propensity to migrate compared to males (Buonomo and Gabrielli 2016). On the other hand, women have also registered an increase in interregional and inter-Macroregional emigration rates (Mckinnish 2008). Finally, the reduction of the gender gap in internal migration has also been attributed to lower male migration since 2008, following the economic crisis (Impicciatore and Strozza 2016).

Internal migration has therefore radically changed over the years; migratory behaviour has become, in fact, much more complex and less readable with the old approaches (Bubbico, Morlicchio and Rebeggiani 2011) to the point that many scholars have wondered if the traditional ones are still adequate, or have become insufficient (Raymer, Bonaguidi and Valentini 2009). Abroad, there is also a perceived need to identify new data, approaches, and analysis methods that help to grasp the ongoing changes (Caselli Vallin and Wunsch 2001; Rogers, Raymer and Little 2010).

This thesis is based on these considerations and attempts to contribute to the current reflection on internal migration in Italy in recent years. . The analysis will focus mainly on the variables described above: the evolution over time of internal migration, age profiles, gender differences and differences between natives and immigrants. In the first three chapters, a central role will be dedicated to internal migration focusing on the place of birth. Specifically, the place of birth will not only be used to distinguish natives from immigrants, but also to identify the migratory patterns of each Italian region of birth (or Macroregions: Northwest, Northeast, Centre and South). Therefore, "place of birth" is a locution that will indicate individuals born in the 20 Italian regions (born in Piemonte, born in Valle d'Aosta, born in Lombardia, etc.) and individuals born abroad. We do not talk about "region of birth" because we include in our definition also people born abroad.

The first chapter serves as an introduction to chapters two and three. It is devoted to describing the procedure utilised to allocate the region of birth to the resident population in Italy. Indeed, the resident population in Italy issued by the National Institute of Statistics (hereafter ISTAT) is also distinguished by

[1] We will use Rogers' (1973) annotation (Macroregion) to indicate Italian macro-areas: Northwest; Northeast; Centre and Sounth.

birth region only in the census years (as well as by sex, age and region of residence). It was therefore necessary to allocate the place of birth (individuals born in the 20 Italian regions and individuals born abroad) to the resident population in Italy from 2002 to 2015 using the 2001 and 2011 censuses as starting points. The population obtained, therefore, is no longer distinguished only by sex, age and region of residence, but also by place of birth in each of the 14 years in the selected time interval (2002-2015). These estimates, on the one hand, made it possible to calculate the denominator necessary for the construction of the different migration rates by ages (necessary for the construction of the multiregional life table used in chapter 2). On the other hand, we were able to implement an application of the gravity model using as explanatory variables also the distinct population by place of birth (for a more detailed description see chapter 3). After describing the calculation procedures adopted for the allocation of the birth region to the resident population in Italy from 2002 to 2015, a description of the resulting population was made. In particular, we chose to use a lifetime migration approach (Livi Bacci 1999) based on the comparison between the place of birth and the place of residence of the populations obtained. We obtained a structural framework of migration flows and considered those who reside in a different region than the birthplace as a proxy of the migrant population. With this logic, in the first chapter, internal migration in Italy is described, starting from the national level, then the Macroregions (Northwest, Northeast, Centre and South) and finally the regional level.

Before outlining each of the chapters, some clarification is needed. As well-known, there is no single definition of what internal migrations are (Livi Bacci 1999; Preston, Heuveline and Guillot 2001). Depending on the target, it may change the type of migration studied. For example, by limiting ourselves to internal migration that involves a change of residence, the definition of internal migration can be based on distance covered by a person moving. In this case, internal migrations can be defined as all changes in residence regardless of the geographical distance covered, or a minimum distance that can be established. Movements between different administrative units in the territory (Macroregions, regions and municipalities) can also identify internal migration. Sometimes, the geographic area is divided into areas that do not correspond to traditional administrative divisions (e.g., moving between urban areas and rural). In this thesis, we will always refer to the shifts between traditional administrative units (Macroregions, regions and municipalities).

In each chapter, there is an analysis devoted to a different administrative level and the overall idea is, therefore, to move from a more general level (firstly, a national level and secondly, to the Macroregions), and arrive at an analysis that moves towards a more specific level (migration between municipalities).

Except for chapter 1, all chapters are organised in the form of journal articles. Therefore, each of them has a very similar structure: an introduction, a literature review, a commentary on results (sometimes preceded by a section on a descriptive data analysis) and finally conclusions and literature references. For this reason, inevitably, some concepts in a chapter can be repeated in another. A second important clarification concerns the content of chapters. Chapter 1, as explained above, introduces chapters 2 and 3. Therefore, it could not be structured in the form of a journal article. In this chapter the procedure for estimating the place of birth (individuals born in the 20 Italian regions and individuals born abroad) of the resident population in Italy is explained. The models proposed in chapters 2 and 3 will be built using the results obtained in the first chapter. Given that it was not possible to also allocate the municipality of birth to the resident population, in chapter 4 (which deals in particular with migration between municipalities), the variable place of birth will only be used to distinguish the native (born in Italy) from the immigrant (born abroad). While chapter 1 is a necessary premise for subsequent chapters up to the third, chapter 4, which addresses the topic of migration between municipalities, is independent from the other chapters and uses a different source of data (European Labour Force Survey).

Specifically, chapter 2 is devoted to the study of migration between Macroregions in Italy from 2002 to 2013. The time span was divided into four periods of 3 years. This choice was made to have equal ample intervals of 3 years and make sure that while distinguishing migrations, apart from gender, age, distribution of origin and destination, distinguishing them also by birthplace, where the number of migration flows was always greater than zero. The approach chosen to study such migrations was that of Rogers' multiregional life tables (1973). However, having distinguished the resident population by birth region (through the procedure outlined in chapter 1), we were able to build tables that took into account the Macroregion of birth in our collective analysis. Therefore, we used the multiregional life table built using the place of birth dependent approaches (Ledent 1980). Using the place of birth makes the results more accurate because they can take into account the fact that a birthplace is a very important determinant of both international and internal migration (Long and Hansen 1975; Ledent 1980). Through the construction of multiregional life tables, one achieves an accurate measure of internal migration: the years of life expectancy at birth lived in the four Italian Macroregions for each birth cohort. In other words, unlike uniregional life tables, it is possible to follow the story of a cohort of 100,000 people, with regards to not only their mortality but also their internal migration, by observing the years of life expectancy at birth for each birth cohort that lives in each Macroregion. International literature has shown that this indicator is more accurate than traditional migration rates and, in our case, provides more accurate results than multiregional life tables built without taking into account the place of birth (Philipov and Rogers 1981; Halli and Rao 1992; Jozwiak 1992). An analysis of the evolution of internal migration over a period of 13 years through multiregional life tables built using the place of birth dependent approach has no precedent in Italy. What kind of results are achieved by using this model? What are the ages and sex distribution of the birth cohorts in each Macroregion? What is the time evolution that emerges from these analyses? How have migratory models changed over time for each birth cohort distinctly by sex and age? How have the migration flow destinations changed migrations between Macroregions? The use of the multiregional life table will enable us to answer these questions.

Additionally in chapter 3, we deal with interregional migrations, but in this case only refer to 2014. However, the approach used tries to go deeper than the analysis in the second chapter. We used the gravity model. As well-known, the Newtonian model applied to migrations is based on direct proportionality to the masses (in our case represented by the populations) and indirect proportionality in relation to the distance between them. As in the previous two chapters, in this case, a central role will be afforded to place of birth (migrants born in the 20 Italian regions and migrants born abroad). In fact, both migration flows and populations will be distinguished by place of birth. More specifically, with reference to migration flows, a matrix will be considered in which, in addition to considering the 20 regions of origin and the 19 destination regions, the matrix will be subdivided into the 21 places of birth. The final vector will thus be 20 * 19 * 21 = 7,980 rows. In addition, in the final model proposed in the chapter, two types of populations will be used in relation to each origin and destination region: the population residents and the distinct population residents according to the place of birth (residents in the region who are born in the same region as those who migrate). A further explanatory variable is information on the gross domestic product (GDP), referring both to the region of origin and destination. The introduction of GDP will allow us to control for the role played by the richness of each Italian region. Finally, the distances will be calculated with regard to the centroids with the Vincenty method (1976). This kind of approach will allow us to ascertain how much and how the internal migration flows are determined by the size of the population residents (also distinguished by place of birth). In addition, we can investigate the role of distance in interregional migration and whether it is different depending on the place of birth. We can also study the role of the geographical location for each region. Finally, the gravity model will allow us to verify, for each region of birth, what role GPD plays in relation to the region of origin and destination.

Chapter 4 is the last of the thesis. This section focuses on the analysis of migration between municipalities. The chapter represents the natural end of the path we have set ourselves, namely to proceed from the more general administrative level (migration between Macroregions) to the more particular one (migration between municipalities). Using the data for Italy provided through the European labour force survey (ILFS), the demographic characteristics (sex, age and place of birth), socio-economic characteristics (employment, income, education, area of residence) and household characteristics (type of personal relationship and parenthood) of internal migrants in Italy are analysed using multivariate analysis. In particular, we will study how these characteristics modify the propensity to migrate for the population residents in Italy (Basile and Causi 2005). We included a set of logistic models in order to control for compositional effects and to analyse the main determinants of migration. The same model has been estimated for some subgroups of women, employed, interviewees aged 25-34, born abroad and migration from the South to the Centre-north. The results obtained will enable us to verify which variables are most affected by the migration propensity and whether specific migratory patterns can be identified by demographic, socio-economic and household characteristics.

Chapter 4 has already been published. The presentation will be as faithful as possible to the original publication. The only variations are: inserting colour figures (instead of black and white) and a modification of the layout to make it homogeneous with regards to the overall thesis. As already pointed out earlier, chapters 2 and 3 are in the form of journal articles. However, in this case, these are not published articles. For this reason, these sections are characterised by a greater effort to adapt the articles to the explanatory needs of the thesis. There will be references to other chapters of the thesis and in some cases the descriptions will be more detailed than required by an international journal article.

CHAPTER 1

RESIDENT POPULATION IN ITALY BETWEEN 2002 AND 2015: ALLOCATING THE PLACE OF BIRTH TO THE POPULATION

1.1 Introduction

This chapter is conceptually divided into two parts. The first part describes the procedure to allocate the place of birth (individuals born in one of 20 Italian regions and individuals born abroad) for the resident population in Italy in each year in the period between 2002-2015, by sex, age and region of residence. By dedicating a separate chapter to the explanation of the procedure, we will not have to repeat it in the next two chapters. The second part describes the population by place of birth that we have used in this study. In particular, we chose to use a lifetime migration approach (Livi Bacci 1999) based on the comparison between the place of birth and the place of residence of the populations obtained. The goal of this descriptive analysis is to illustrate the structural characteristics of the population we obtained (distinct by place of birth), which is a prerequisite for subsequent chapters. Figure 1.1 shows the different Macroregions (Northwest, Northeast, Centre and South) and the regions of Italy. This indication will be particularly useful to allow the reader to have a clear idea of the Italian geographical subdivisions that will be used in this work, which correspond to those typically used in official statistics.

1.2 Allocating the place of birth to the population of the year following the census

Only the census data provides the resident population in Italy by sex, age, region of residence and region of birth (Table 1.1). Until now, the Intercensal Population Estimates data (IP) and the post-census resident population from Population Register Offices data (PP) are the only Italian sources with data for the Italian resident population after the years of the census (in particular after 2001 and 2011). However, the IP and PP sources describe the resident population by sex, age and region of residence, but not the region of birth. The aim of the first three chapters of this thesis is to analyse internal interregional migration in Italy in the period 2002-2015 focusing on the place of birth. Therefore, a preliminary allocation of the place of birth (individuals born in the 20 Italian regions and individuals born abroad) to the Italian resident population during the period 2002-2015 was necessary[2].

[2] We will refer to place of birth (b) in the whole thesis instead of region of birth because we will consider not only people born in the 20 Italian regions, but also individuals born abroad.

Fig. 1.1 Italian regions and Macroregions

Macroregions: Northwest Northeast Centre South

Tab. 1.1 Variables in the selected Italian sources

Sources	Acronym	Sex	Age	Residence	Place of birth
The resident population from the Italian census data in 2001 and 2011	CP	X	X	X	X
Intercensal Population Estimates data	IP	X	X	X	
The post-census resident population from Population Register Offices data	PP	X	X	X	
Deaths from Intercensal Population Estimates data and from the post-census resident population from Population Register Offices data	DI	X	X	X	
Births from Intercensal Population Estimates data and from the post-census resident population from Population Register Offices data	BI	X	X	X	
Deaths from Vital Statistics System	DV	X	X	X	X
Births from Vital Statistics System	BV	X	X	X	X

The sources used to allocate the place of birth to the resident population in the year following the census are: the resident population from the Italian census data in 2001 and 2011 (CP); the Intercensal Population Estimates data (IP) (years 2002-2010); the post-census resident population from Population Register Offices data (PP) (years 2012-2015); the Vital Statistics System of deaths (DS) and births (BS)[3]. All these sources distinguish the population by sex, age and region of residence. The Intercensal Population Estimates data (IP) and the post-census resident population from Population Register Offices data (PP) are both provided from the "Population Register Offices data". Table 1.1 summarises all of this information.

The procedure for allocating the place of birth to the resident population in Italy from 2002 to 2015 has as its starting point the resident population from the Italian census data in 21/10/2001. In particular, the population from the census (CP) used in this thesis is distinguished by sex (s), age (x), region of residence (r) and place of birth (b). Based on this information it was possible to obtain a population with the same detail (in particular distinguished by place of birth) by referring to 1 January, 2002 using the Intercensal Population Estimates (IP) data released from the National Institute of Statistics in Italy (ISTAT)[4]:

$$ {}_{2002}^{\ \ \ \ \ b}P_{x,s}^{r} = {}_{21/10/01}^{\ \ \ \ \ \ \ \ \ \ b}CP_{x,s}^{r} \frac{{}_{2002}IP_{x,s}^{r}}{{}_{21/10/01}CP_{x,s}^{r}} \tag{1} $$

This formula has been applied with a double iteration, to ensure an optimal match between the population we obtained and that of the ISTAT official data, with the advantage, however, of allocate the place of birth. The assumption underlying this procedure is that in just over two months between the census date (21/10/2001) and 01/01/2002, the distribution of the resident population by region of birth has not changed.

Similarly, *mutatis mutandis*, we have passed from the 15th Census data (09/10/2011) (CP) to the population of 01/01/2012 using (in this case) the post-census resident population from Population Register Offices data (PP):

$$ {}_{2012}^{\ \ \ \ \ b}P_{x,s}^{r} = {}_{09/10/11}^{\ \ \ \ \ \ \ \ \ \ b}CP_{x,s}^{r} \frac{{}_{2012}PP_{x,s}^{r}}{{}_{09/10/11}CP_{x,s}^{r}} \tag{2} $$

In this case, the notation ${}_{2012}PP_{x,s}^{r}$ refers to the post-census resident population (PP) by sex (s), age (x) and region of residence (r) but without the place of birth (b). Also in this case, the assumption is that from the date of the Census (09/10/2011) to 01/01/2012 the structure by region of birth has not changed in any Italian region.

1.3 Reproportioning flow variables

Once we obtained the distinct resident populations by place of birth in 2002 and in 2012, we had to assign the region of birth in the remaining years of the intercensal period (2003-2011) and post-census

[3] In Italy there are two separate systems to record demographic events (except census and surveys): "Stato civile" and "Anagrafe". They can both be translated as "Population Register Offices data". In this chapter it will be necessary to distinguish between these two Italian data sources, therefore, "Anagrafe" will be named "Population Register Offices data" and "Stato civile" the "Vital Statistics System".

[4] To correct the over-estimation of post-census data, ISTAT provides the Intercensal Population Estimates data distinguished by sex and age. In our procedure, we will use the latter.

period (2013-2015). A preliminary estimation was to re-proportionate all the data from the Vital Statistics System (that are distinguished by region of birth – Table 1.1) so that their totals were the same as the corresponding Intercensal Population Estimates data and post-census data (that are not distinguished by region of birth) released from ISTAT. Below the equations for the re-proportion of deaths, births, immigration and emigration are presented.

With regard to deaths (D) from 2002 to 2011 (time t), the total number of deaths provided by Vital Statistics System (DV) distinguish the data by age and sex of each region of residence and place of birth (${}^{b}_{t}DV^{r}_{x,s}$) (Table 1.1). However, the total deaths indicated in the Intercensal Population Estimates data (DI) do not distinguish the deaths by age and place of birth (${}_{t}DI^{r}_{s}$) (Table 1.1). In order to ensure a correspondence between our estimations and official ISTAT data, we used the follow formula to allocate the place of birth to the total deaths indicated in the Intercensal Population Estimates data (DI):

$$ {}^{b}_{t}D^{r}_{x,s} = {}^{b}_{t}DV^{r}_{x,s} \frac{{}_{t}DI^{r}_{s}}{{}_{t}DV^{r}_{s}} \qquad (3) $$

The procedure for the births (B) data from 2002 to 2011 is similar. The total number of births by age and sex of each region of residence and place of birth ${}^{b}_{t}BV^{r}_{s}$ are provided by the Vital Statistics System (Table 1.1). Instead, the total births indicated in the Intercensal Population Estimates (BI) distinguish the place of residence, but not also the place of birth (${}^{b}_{t}BI_{s}$) (Table 1.1). The total deaths indicated in Intercensal Population Estimates data (DI) and the total births indicated in the Intercensal Population Estimates (BI) are both provided by the "Population Register Offices data". Therefore, in order to ensure a correspondence between our estimations and official ISTAT data, we used the following formula to allocate the place of birth to the total births indicated in the Intercensal Population Estimates (BI):

$$ {}^{b}_{t}B^{r}_{s} = {}^{b}_{t}BV^{r}_{s} \frac{{}_{t}BI^{r}_{s}}{{}_{t}BV^{r}_{s}} \qquad (4) $$

There was no need for a reproportioning procedure with respect to internal (interregional) and international migrations (both immigrations and emigrations) because the data provided already distinguish the flows by place of births.

The formulas for the post-census period (t = 2012-2015) are analogous, with the only difference that the reproportioning procedure has been achieved not with respect to the Intercensal Population Estimates data (since, of course, it is not available), but with respect the post-census Population Register Offices data.

1.4 Allocation of the birthplace to the intercensal and post-census resident population

After the allocation of the birthplace to the population on 01/01/2002 (using the procedure in section 1.2) and after the reproportioning of the flow variables prepared as described above (section 1.3), we allocated the birthplace also to the resident populations in the following years (until 01/01/2015). Two procedures were used. The first procedure was applied to the Italian resident population from 01/01/2003 to 01/01/2011; the second procedure was applied to the post-census period (2012-2015). The calculation formulas were two: the first for the population of 0 years, the second for all other age groups.

“P” represents the population, “B” the births, “D” the deaths, “F” the internal (between regions) and international migration flows, “i” the origin of the internal and international migration and “j” the destination of the internal and international migration. We used in this case the annotation “t” in two ways: when “t” was placed on the left of the capital letter, represents the year of the event; when “t” was placed on the right of the capital letter represents the year of birth (the cohort of the population). Using the following formulas, we obtained a provisional Population by place of birth $(\widetilde{P})$.

For the population at 0 years at the time t+1:

$$ {}_{t+1}^{b}\widetilde{P}_{0,s}^{r} = {}_{t}^{b}B_{s}^{r} - {}_{t}^{b}D_{0,s,t}^{r} + \sum_{i} {}_{t}^{b}F_{0,s,t}^{i,r} - \sum_{j} {}_{t}^{b}F_{0,s,t}^{r,j} \tag{5}$$

with i ≠r and j ≠r

For all other age groups (x) at the time t+1:

$$ {}_{t+1}^{b}\widetilde{P}_{x,s}^{r} = {}_{t}^{b}P_{x,s}^{r} - {}_{t}^{b}D_{s,t-x}^{r} + \sum_{i} {}_{t}^{b}F_{s,t-x}^{i,r} - \sum_{j} {}_{t}^{b}F_{s,t-x}^{r,j} \tag{6}$$

with x≠0, i ≠r and j ≠r

To ensure the correspondence between the resident population by region of birth that we obtained $({}_{t}^{b}\widetilde{P}_{x,s}^{r})$ and the one from the Intercensal Population Estimates data $({}_{t}IP_{x,s}^{r})$, the following equation was applied:

$$ {}_{t}^{b}P_{x,s}^{r} = {}_{t}^{b}\widetilde{P}_{x,s}^{r} \frac{{}_{t}IP_{x,s}^{r}}{{}_{t}\widetilde{P}_{x,s}^{r}} \tag{7}$$

with 01/01/2003≤ t ≤01/01/2011

“P” represents the population by place of birth we used in this thesis. This formula has been applied with a double iteration to ensure that the final population conforms to the official data.

For the period 2013-2015, the procedure was the same. However, in this case the starting point of the analysis covered the population from 01/01/2012 that was obtained through the procedure described in section 1.2. In this case, we used the post-census resident population from Population Register Offices data $({}_{t}PP_{x,s}^{r})$ for the numerator:

$$ {}_{t}^{b}P_{x,s}^{r} = {}_{t}^{b}\widetilde{P}_{x,s}^{r} \frac{{}_{t}PP_{x,s}^{r}}{{}_{t}\widetilde{P}_{x,s}^{r}} \tag{8}$$

with 01/01/2012≤ t ≤01/01/2015

1.5 Comparison with Official Data

For each of the 20 Italian regions and for each year of the interval 2002-2015, we have obtained a population that was differentiated not only by gender and age (101 single age classes with a final group aged 100 and older), but also in 21 places of birth (residents born in the 20 Italian regions and residents born abroad). The total resident population in Italy by place of birth directly corresponds with the official ISTAT data.

Yet, we investigated the differences between the Intercensal Population Estimates data released from ISTAT and the population we obtained. Therefore, we considered it necessary to analyse the differences between the two populations in the absence of corrections made by the iteration procedure.

As an indicator of the differences between the two populations, we used the following factor in the absence of iterations:

For the intercensal period: $\frac{{}_{t}\widetilde{P}^{i}_{x,s}}{{}_{t}IP^{i}_{x,s}}$; (9)

with 01/01/2002≤ t ≤01/01/2011

For the post-census period: $\frac{{}_{t}\widetilde{P}^{i}_{x,s}}{{}_{t}PP^{i}_{x,s}}$; (10)

with 01/01/2012≤ t ≤01/01/2015

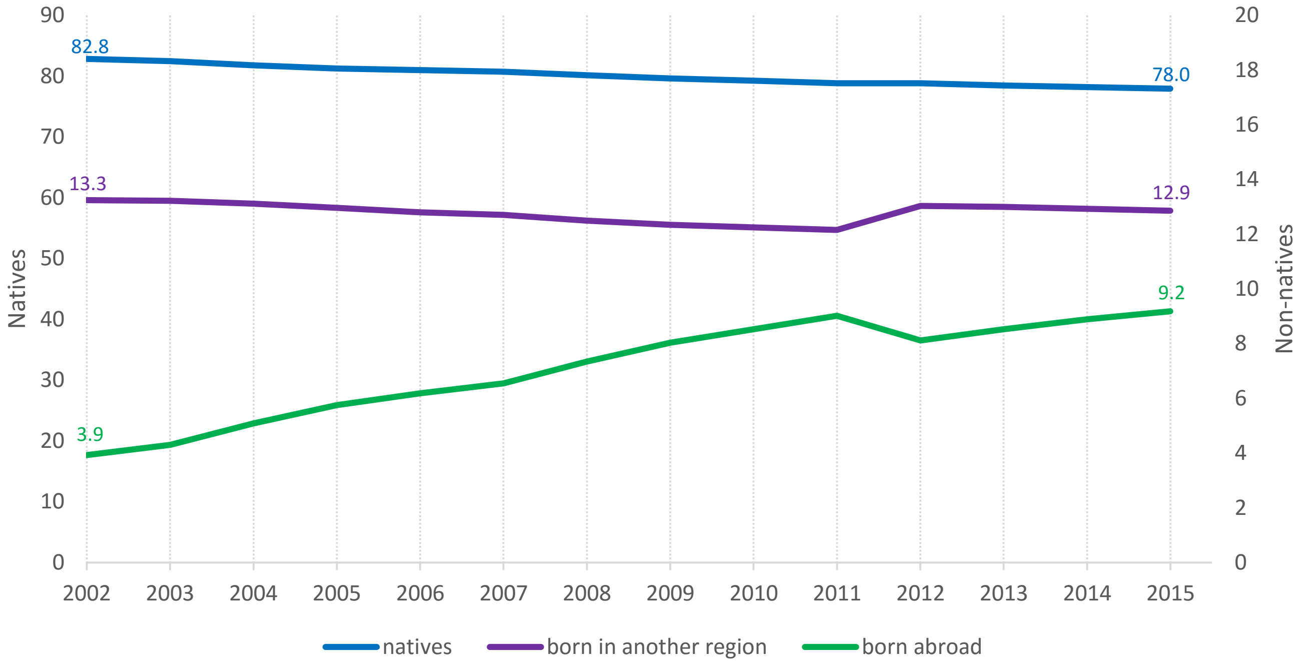
The final result showed that up to 69 years the obtained values were always close to 1 (on average about 1.00012). However, after the age of 80 the values are often greater than 1.02 or less than 0.98 and, in some cases, similar values were obtained in the age interval between age 70 and 79. For this reason, in the next two chapters, whenever we distinguish the population by age (single years or age classes), we work with a final age class of 70 years old and more.

1.6 Italian population by place of birth

We distinguished the population we obtained using these procedures into the following subgroups: "natives", those who reside in the region of birth; "born in another region", those who reside in a different region than the one in which they were born; "born abroad", those who were not born in Italy.

Clearly, "natives" represent the highest percentages in all the years considered for the analysis. Figure 1.2 shows, however, that they are decreasing over time. The real insight observed over the period 2002-2015 is the strong increase in the "born abroad" quota. They increased from 3.9% to 9.2%. The percentages of "born in another region" is rather constant over the observed period. However, the percentages were declining until 2011 (before the overestimation of the resident population in the post-census period). Therefore, it is interesting to examine composition changes within the peninsula at both the Macroregional and the regional level. Based on the considerations above, as already shown (ISTAT 2017), the non-decreasing trend of the total Italian resident population until 2015 is attributable to the increase in the foreign presence and to the overestimation of the population in the post-census period.

Fig. 1.2 Percentages of the resident population in Italy by place of birth ("natives", "born in another region" and "born abroad"). Italy 2002-2015



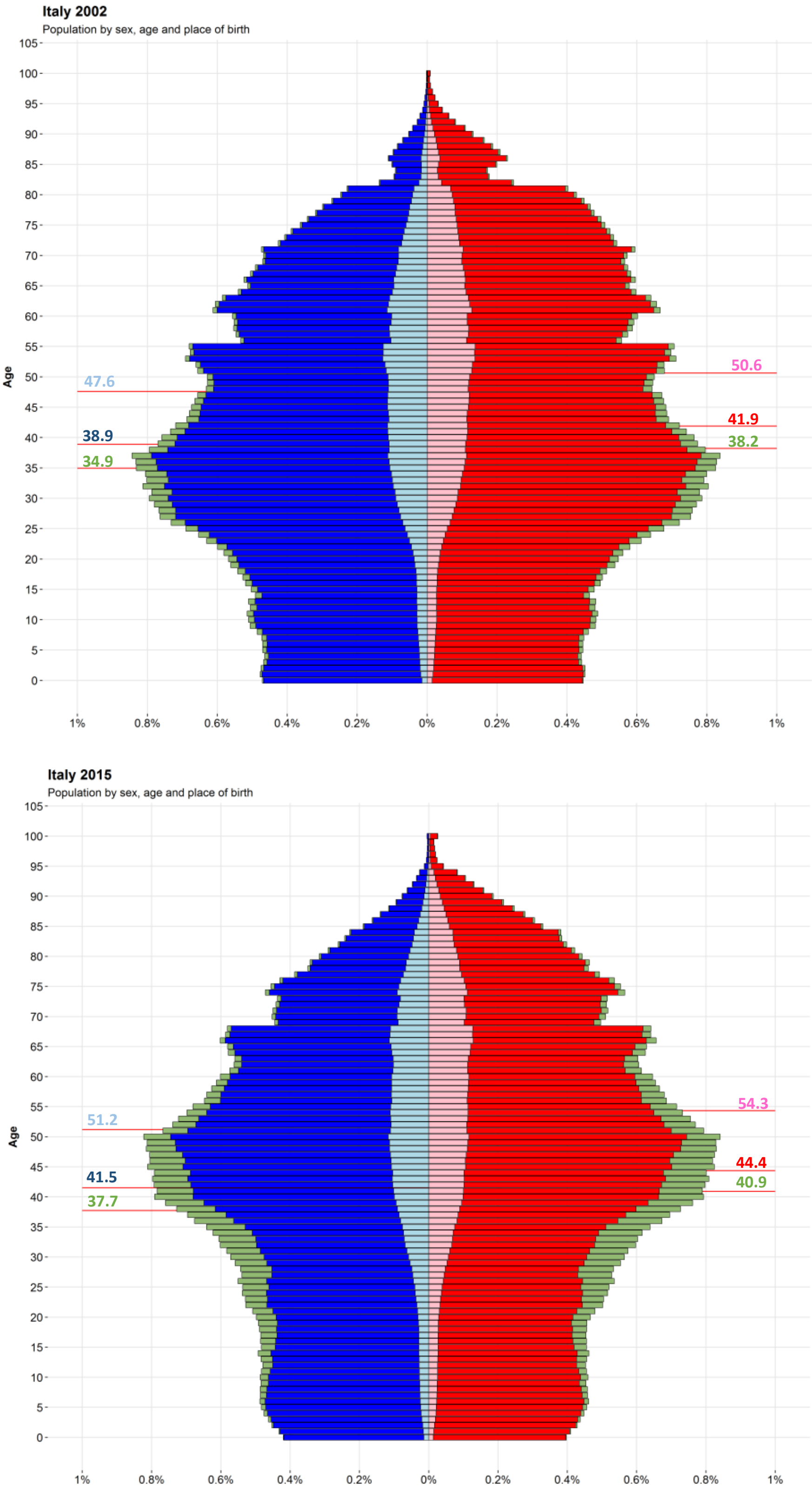
Source: our elaborations on ISTAT data (estimates).

Figure 1.3 shows, with reference to the entire peninsula, the pyramid age, distinguishing the percentage of "natives", "born in another region" and "born abroad" in 2002 and 2015. As previously reported, the Italian population is continuing to age (ISTAT 2017).

Figure 1.3 shows that this process is the result of an ageing of all individuals considered by their places of birth in this analysis. Over the course of 14 years, the overall mean age of the resident population in Italy has increased by about 2 and a half years for both males and females (respectively +2.5 and +2.4 years). "Born in another region", by definition, have very low values between 0 and 5 years old, which, influences the mean age estimation (resulting in particularly high values). It is from this perspective that the average age in 2015 should be interpreted (50.6 years old for females and 47.6 years old for males). The mean age in 2015 for individuals "born abroad" is the lowest, as shown in the Figure 1.3 for both males (37.7) and females (40.9). The "natives" have an intermediate average age in 2015 (41.5 years old for males and 44.4 years old for females).

For each Macroregion, the trend over time is similar to the one already described: a decrease in the native population, near-constant percentages in non-natives born in Italy and an increase of individuals "born abroad". Yet, the resident populations by place of birth have different profiles for each Macroregion. We chose to consider 4 Macroregions (Northwest, Northeast, Centre and South), combining the South and the Islands (henceforth: the South) (Figure 1.1), as these areas have quite similar profiles.

Fig.1.3 Pyramid age by place of birth. Italy 2002 and 2015



Males **Females**

born abroad natives born in another region born in another region natives born abroad

Source: our elaborations on ISTAT data (estimates).

Table 1.2 shows, with reference to 2015, that the model of the South differs from that of the rest of Italy. This Macroregion is characterised by the lowest percentages of both “born abroad” (5.1%) and “born in another region” population (5.1%). Born in the South and “born abroad” are the highest percentages for all the Macroregions of residence (if we exclude the percentages of “natives”). The Northwest is the Macroregion of residence with the largest number of non-native individuals (4,974,170 equal to 30.8%). In this Macroregion of residence, the percentage of people born in the Northeast is not negligible (3.5%), although individuals born in the South and “born abroad” comprise the highest percentages (12.0% and 11.0%, respectively). The Centre has the second highest percentage of non-native individuals, which is characterised by a considerable concentration of individuals born in the South (10.2%) and abroad (11.0%). Finally, the Northeast Macroregion of residence has the lowest percentage of individuals born in the South (6.6%) and the highest percentage of “born abroad” (12.1%).

Tab. 1.2 Population resident in Italy in each division distinctly by area of birth. Absolute values and percentage values. Italy 2015

Residence	Place of birth							
	Natives	Non-natives						Total
		Born in another region					Born abroad	
		Northwest	Northeast	Centre	South	Total		
Northwest	11,164,538	450,051[(a)]	566,873	240,377	1,937,701	3,195,002	1,779,168	16,138,708
Northeast	8,673,513	316,935	304,832[(a)]	177,698	775,062	1,574,527	1,413,198	11,661,238
Centre	8,784,596	210,014	189,686	346,479[(a)]	1,231,646	1,977,825	1,328,283	12,090,704
South	18,772,410	225,317	100,433	216,193	530,377[(a)]	1,072,320	1,060,453	20,905,183
Italy	47,395,057	1,202,317	1,161,824	980,747	4,474,786	7,819,674[(a)]	5,581,102	60,795,833

Residence	Place of birth (%)							
	Natives	Non-natives						Total
		Born in another region					Born abroad	
		Northwest	Northeast	Centre	South	Total		
Northwest	69.2	2.8[(a)]	3.5	1.5	12.0	19.8	11.0	100.0
Northeast	74.4	2.7	2.6[(a)]	1.5	6.6	13.5	12.1	100.0
Centre	72.7	1.7	1.6	2.9[(a)]	10.2	16.4	11.0	100.0
South	89.8	1.1	0.5	1.0	2.5[(a)]	5.1	5.1	100.0
Italy	78.0	2.0	1.9	1.6	7.4	12.9	9.2	100.0

[(a)]When the Macroregion of residence and that of birth are the same, the percentage refer to those who reside in a different region than the one in which they were born.

Source: our elaborations on ISTAT data (estimates).

The profiles described above are similar at the regional level. “Born in another region” and “born abroad” have lower percentages in the regions of the South. In the Northwest, these percentages are particularly high (Figure 1.4 and Table 1.3). The Northern regions show two main characteristics: on the one hand, the ability to attract individuals born in the South and, on the other, to attract the “natives” in the geographically closest regions. Looking at the Northwest regions of residence, two distinct models are identified. Piemonte and Lombardia, two regions that traditionally have a great ability to attract migratory flows, have the lowest percentages of “born in another region” (22.9% and 17.6%, respectively). Nevertheless, they have the highest percentages of “born abroad” (1.3% and 11.5%, respectively) and born in the South (particularly born in Sicilia, Puglia, Calabria and Campania). The two remaining regions of the Northwest (Valle d'Aosta and Trentino Alto Adige) show another pattern. These regions, although showing a non-negligible attraction for migrants born in the South, host high percentages of individuals born in the Northwestern regions. Among residents in Valle d'Aosta, 9.5% were born in Piemonte and 2.5% in Lombardia. Similarly, among residents in Liguria, 4.2% were born in Piemonte and 2.8% in Lombardia. Among the Northeastern regions of residence, distance is an even more important variable. In all the Northeastern regions, there is at least one region in Northern Italy among the first three regions of birth in the ranking. Emilia Romagna stands out with the highest percentage of "born in another region" (18%) and "born abroad" (12.4%). Interestingly, individuals born in Campania are one of the first three regions of birth among the residents in all the regions of the Northeast (Trentino Alto Adige; Veneto; Friuli Venezia Giulia and Emilia Romagna). With regards to the Central regions of residence, Lazio shows a different pattern than the other regions. Lazio has the highest percentage of "born in another region" (17.9%). Moreover, the first three regions of birth residing more frequently in Lazio are all born in the South (Campania, Calabria and Puglia). For all the remaining regions of the Centre, the ones born in Emilia Romagna always have high percentages. The regions of the South have lower percentages of "born abroad". Compared to those of the rest of Italy, the regions of the South also have the lowest percentages of "born in another region". Abruzzo, Molise and Basilicata are the regions with the highest percentages of "born in another region" (13.1, 16.3 and 12.3%, respectively). Impressively, individuals born in Lombardia are among the main birth regions in Campania (0.4%), Puglia (0.6%), Calabria (0.7%), Sicilia (0.6%) and Sardegna (0.7%). However, in these cases we refer to small numbers and low percentages, evident signs of a greater heterogeneity in the place of birth in the regions of the South.

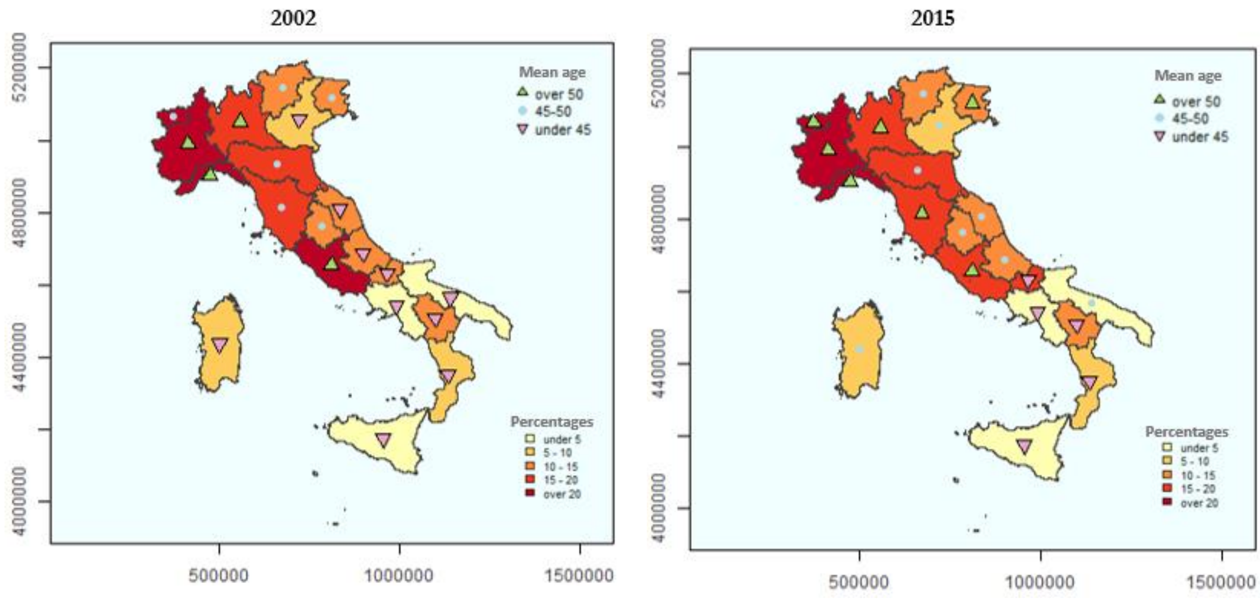
Figure 1.4 provides an in-depth analysis of the evolution of the characteristics of individuals "born in another region". With reference to the percentage of "born in another region", the picture remained quite similar over time. One of the differences that emerges comparing 2002 and 2015 is the lower percentage of "born in another region" in Lazio. In Molise, however, there is an increase in the percentage. Another element highlighted in Figure 1.4 is the ageing process of that population. In no case was the mean age of the "born in another region" in 2015 lower than in 2002. When present, the variations are always signs of ageing. In particular, according to Figure 1.4, the ones who have aged are the "born in another region" residents in Puglia, Abruzzo, Sardegna, Marche, Toscana, Veneto, Friuli Venezia Giulia and Valle d'Aosta. Therefore, this applies to almost half of the Italian regions. In 2015, all the "born in another region" residents in the Northwest have an average age of over 50 years because of this ageing. In contrast, the "born in another region" residents in the South in 2002 were all characterised by an average age below 45 years old, so they are considerably younger than those in the other Macroregions.

Tab. 1.3 Percentage of "born in another region", of "born abroad" and the ranking of the first three Italian regions of birth. Italy 2015

Region of residence	% "born in another region"	% "born abroad"	First three Italian region of birth (%)					
Piemonte	22.9	10.3	Sicilia	3.7	Puglia	3.0	Calabria	2.8
Valle D'Aosta	28.5	9.3	Piemonte	9.5	Calabria	5.4	Lombardia	2.5
Lombardia	17.6	11.5	Sicilia	2.8	Puglia	2.6	Campania	2.4
Trentino Alto Adige	12.8	11.8	Veneto	3.4	Lombardia	2.5	Campania	1.2
Veneto	9.3	11.3	Lombardia	1.5	Friuli V.G.	1.1	Campania	1.0
Friuli Venezia Giulia	14.8	14.7	Veneto	4.8	Campania	2.0	Sicilia	1.5
Liguria	23.9	10.1	Piemonte	4.2	Sicilia	2.9	Lombardia	2.8
Emilia Romagna	18.0	12.4	Campania	3.4	Lombardia	2.5	Puglia	2.3
Toscana	16.2	11.1	Campania	3.5	Sicilia	2.2	Lazio	1.3
Umbria	14.2	11.7	Lazio	3.8	Campania	2.3	Toscana	1.7
Marche	12.2	10.8	Campania	1.9	Puglia	1.8	Emilia R.	1.5
Lazio	17.9	10.9	Campania	4.4	Calabria	1.6	Puglia	1.6
Abruzzo	13.1	9.3	Lazio	2.4	Marche	2.0	Campania	1.8
Molise	16.3	6.4	Campania	5.4	Abruzzo	3.1	Puglia	2.9
Campania	3.7	4.6	Lazio	0.8	Lombardia	0.4	Puglia	0.4
Puglia	4.6	4.3	Campania	0.9	Lombardia	0.6	Basilicata	0.6
Basilicata	12.3	4.6	Puglia	5.1	Campania	3.3	Calabria	1.1
Calabria	5.8	6.3	Campania	1.0	Sicilia	1.0	Lombardia	0.7
Sicilia	3.2	5.0	Lombardia	0.6	Calabria	0.5	Campania	0.4
Sardegna	5.8	3.8	Lombardia	0.9	Piemonte	0.7	Lazio	0.8

Source: our elaborations on ISTAT data (estimates).

Fig. 1.4 Percentage and average age of individuals "born in another region". Italy 2002 and 2015



Source: our elaborations on ISTAT data (estimates).

1.7 Total and specific emigration rates by place of birth

In the next chapter, we will analyse internal migration between Macroregions of birth using the multiregional model of Rogers (1973). In order to construct the latter model it is necessary to have the emigration rate of each Macroregion of residence by place of birth. Therefore, in this section, for each Macroregion of birth, we show the specific emigration rate (between Macroregions) for each age class. We use the most recent triennial used in next chapter (2011-2013). Like in the previous section, we consider three places of birth: individuals that reside in the Macroregion of birth ("natives"); individuals that reside in a different region than the one in which they were born ("born in another Macroregion"); individuals that were not born in Italy ("born abroad").

In this case, we do not consider individuals younger than age 15. From age 0 to age 14 the correspondent denominator (the average resident population) for individuals born abroad and born in an Italian Macroregion other than the Macroregion of birth, is too small. For consequence, the specific emigration rate for ages younger than age 15 results very high[5].

It is generally accepted that individuals who have already experienced a shift have a higher propensity to migrate (Lundholm 2006). Is this true both for individuals born abroad and for those that reside in a Macroregion other than the Macroregion of birth? The propensity to migrate is higher among individuals residents in a Macroregion other than the Macroregion of birth or among individuals born abroad? We want to analyse if individuals that have already experienced a migration mainly migrate because they are less linked to the territory (Belanger and Rogers 1992). In order to answer to this question, it will be useful to analyse the specific and total emigration rates by place of birth.

Figure 1.5 shows the specific emigration rate by gender of total resident population by place of birth. In this section when we refer to the Macroregion of residence we are referring to the residence before the migration. Therefore, the Macroregion of origin of migration flow corresponds to the Macroregion of residence (r=i).

It is evident that the specific emigration rates of individuals resident in South (before the migration) are higher compared to individuals residents in Centre-north. For this reason, for individuals resident in South the y-axis is higher compared to the other Macroregions of residence. Secondly, the specific emigration rate of people born abroad is always higher than for natives (for all the age classes considered and for each Macroregion of residence).

Conversely, the specific emigration rate of individuals born in an Italian Macroregion other than the Macroregion of residence ("born in another Macroregion") (Figure 1.6) is higher than the specific emigration rate of people born abroad. It is also interesting that the specific emigration rate for natives (Figure 1.5) is less than one third of the same rate of individuals "born in another Italian Macroregion".

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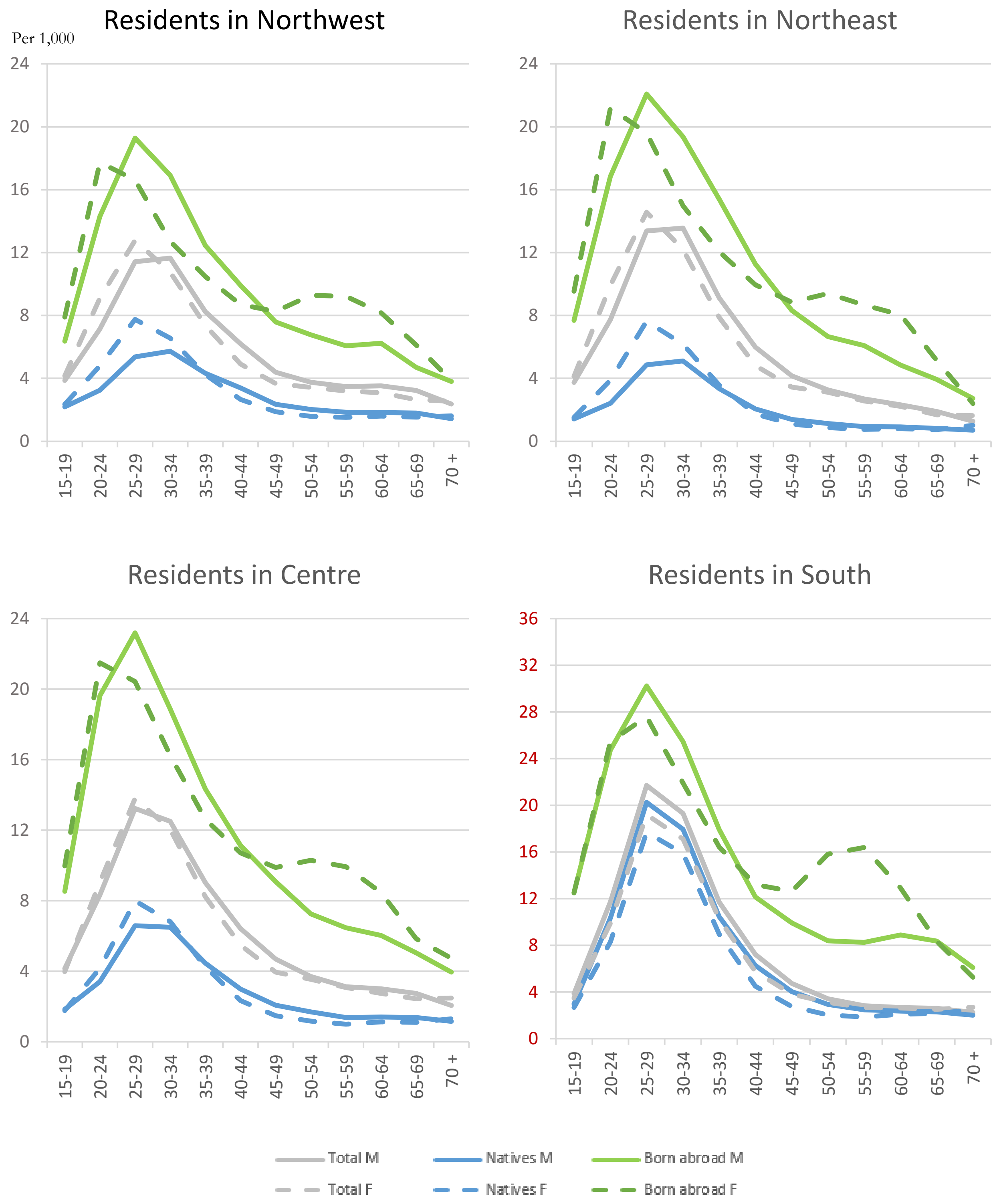
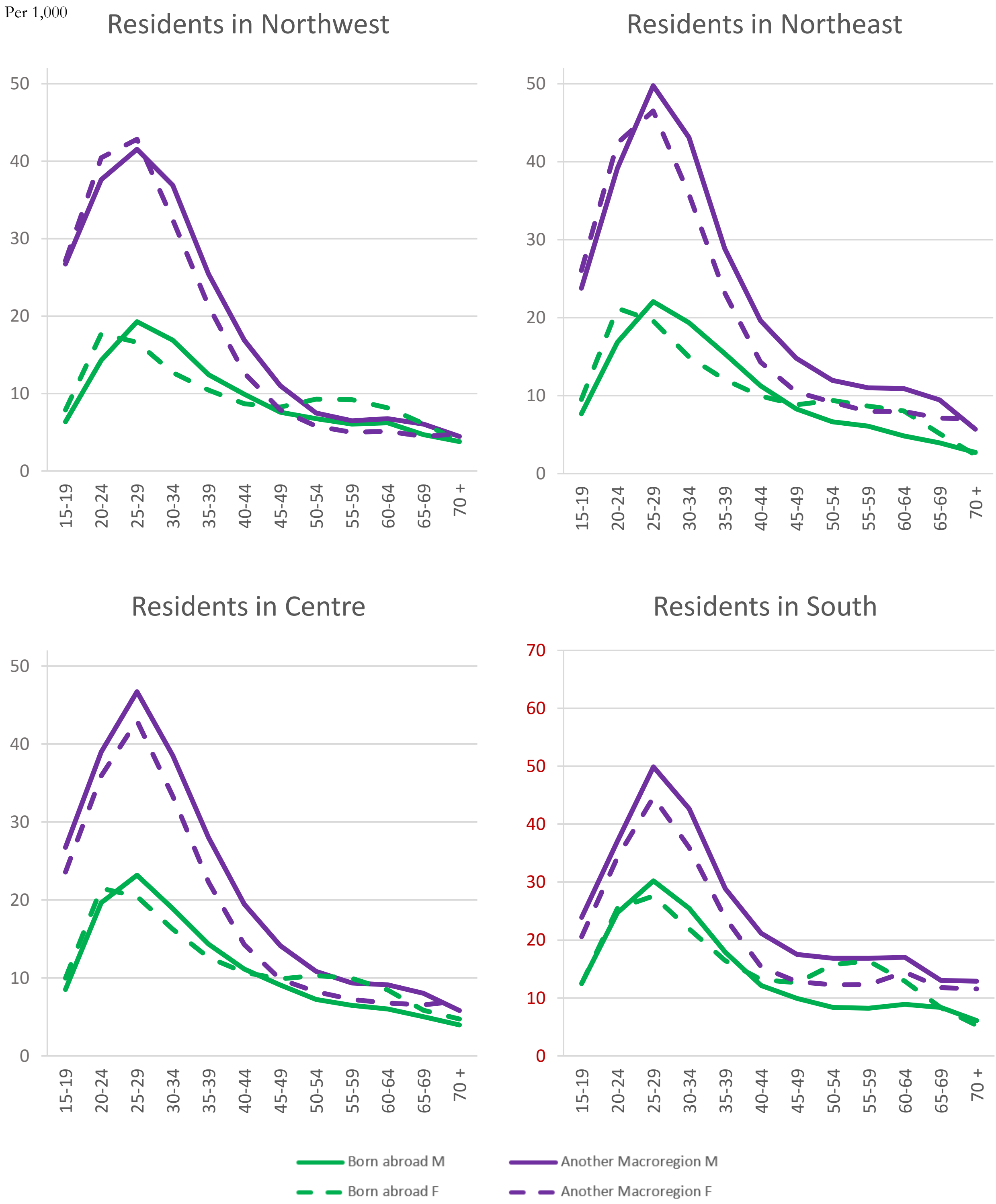
[5] The specific emigration rate by age (x) from the Macroregion "i" is equal to:
- for total resident population: emigration of resident individuals in the Macroregion "i" from the Macroregion "i" to another Macroregion "j" divided by the average population of residents in the Macroregion "i";
- for "natives": emigration of natives (born and residents in the Macroregion "i") from the Macroregion "i" to another Macroregion "j" divided by the average population of residents born in the Macroregion "i";
- for individuals "born in another Macroregion": emigration of individuals "born in another Macroregion" (born in a Macroregion other than the Macroregion "i") from the Macroregion "i" to another Macroregion "j" divided by the average population of residents in the Macroregion "i" born outside the Macroregion "i";
- for individuals "born abroad": emigration of individuals "born abroad" from the Macroregion "i" to another Macroregion "j" divided by the average population of residents in the Macroregion "i" born abroad.

Fig. 1.5 Specific emigration rates (per 1,000) between Macroregions by age (15 years and older), gender, Macroregion of residence (before the migration) and place of birth: total resident population, natives and born abroad. Italy 2011-2013



Source: our elaborations on ISTAT data (estimates).

Fig. 1.6 Specific emigration rates (per 1,000) between Macroregions by age (15 years and older), gender, Macroregion of residence (before the migration) and place of birth: born in another region, born abroad. Italy 2011-2013



Source: our elaborations on ISTAT data (estimates).

Therefore, we can consider that people who have already experienced a shift (both individuals born in another Macroregion and individuals born abroad) have a higher propensity to migrate (DaVanzo 1978;

Herzog Jr. and Schlottmann 1984), but the effect is stronger among individuals “born in another Macroregion”. In conclusion, the propensity to migrate of natives is the half of the propensity of individuals born abroad and less than half compared to people “born in another Italian Macroregion” than for those “born abroad”. Individuals born in an Italian Macroregion other than the Macroregion of birth have an important role in determining the specific emigration rate of the total resident population. Therefore, we can conclude that an important role is played by the place of birth. In Italy, usually when we study the specific emigration rate we do not consider the place of birth, but the Figure 1.5 and 1.6 show that it is important to take into account this variable.

Referring to what described before, there are not important differences by sex. The principal difference between males and females is that females tend to migrate before than counterpart among all the place of birth considered, as international literature already demonstrated (Mulder 1992; Mulder and Wagner 1993).

Total emigration rates (TER) of resident population of 15 years and over (Table 1.4) confirm the results above. Both males and females natives have the lower TER in each Macroregion of residence (before the shift). Conversely, individuals born in a Macroregion other than the Macroregion of residence (“born in another Macroregion”) have the highest TER for Males and females in all Macroregions of residence considered. On one hand, among Individuals born abroad females have the larger TER; on the other hand, among individuals “born in another Macroregion” males have larger TER. Considering the mean age at internal migration (between Macroregions), individuals born in “another Macroregion” have the younger mean age in Centre-north compared to other places of birth. Conversely, if we consider residents in South, “born in another Macroregion” are the older ones among males (mean age 38.8). In reverse, male natives resident in Centre-north have the older mean age compared to the other place of birth; instead, for males resident in South is the opposite. Females born abroad are the older in all the Macroregion considered compared to the other places of birth.

Table 1.4 - Total Emigration Rates (TER per 1,000) and Mean age at emigration between Macroregions of resident population (before the migration) of 15 years and over by Macroregion of residence, sex and place of birth. Italy, 2011-2013

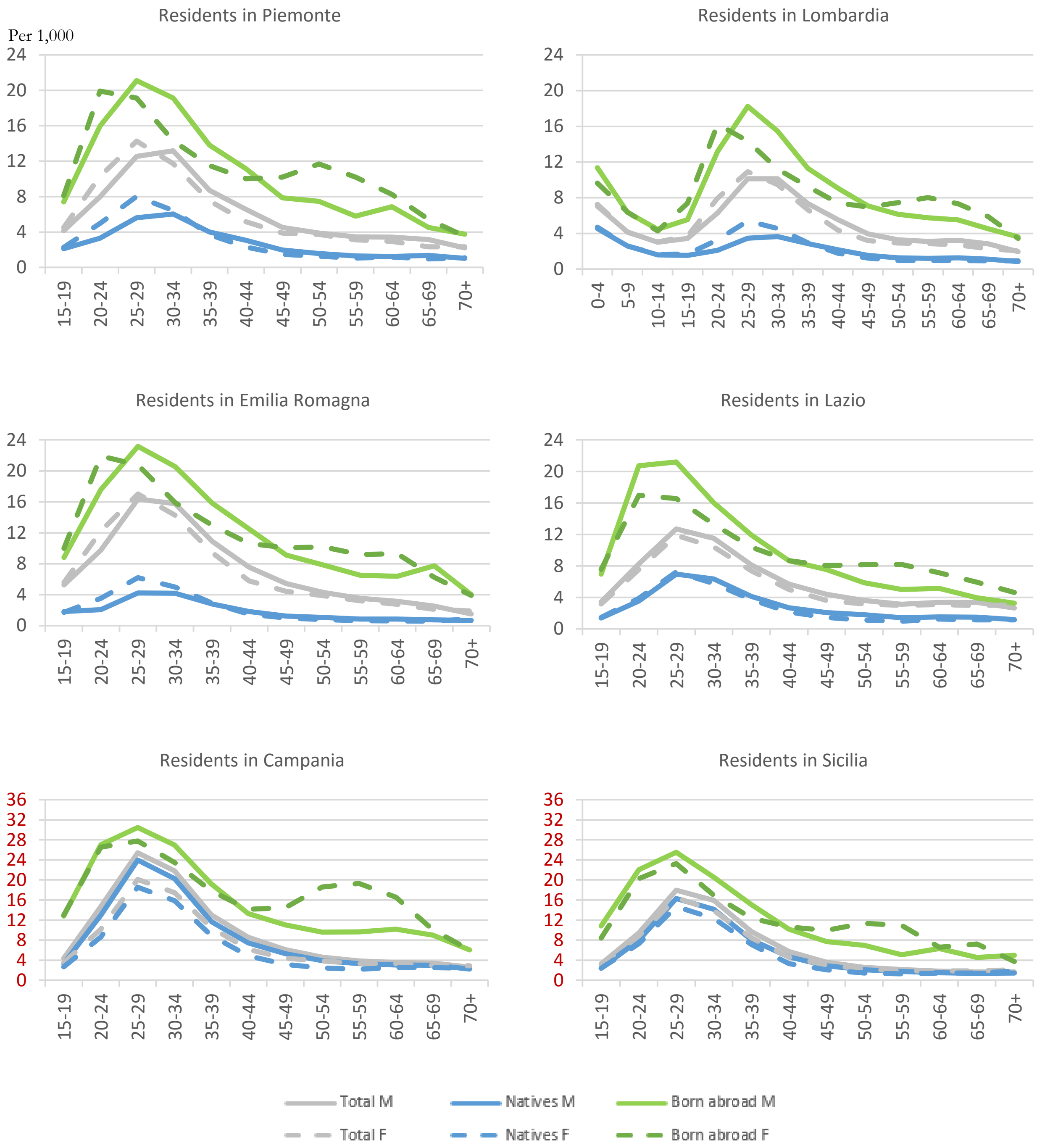
Macroregion of residence	Males				Females			
	Total	Natives	Another Macroregion[a]	Born abroad	Total	Natives	Another Macroregion[a]	Born abroad
	TER (15 years and over)				TER (15 years and over)			
Northwest	346	178	1137	572	338	190	1050	595
Northeast	346	126	1341	626	341	149	1190	649
Centre	365	175	1278	668	354	173	1090	703
South	470	422	1489	864	416	357	1249	942
	Mean age (15 years and over)				Mean age (15 years and over)			
Northwest	39,1	39,8	34,2	38,9	37,8	37,5	32,8	40,2
Northeast	36,7	37,2	36,1	37,3	35,8	35,1	34,7	38,4
Centre	37,8	38,1	35,5	37,8	37,5	36,3	34,9	39,3
South	35,9	35,8	38,8	38,0	36,4	35,9	38,3	40,1

[a] The locution “Another Macroregion” indicate individuals born in a Macroregion other than the Macroregion of residence.

Source: our elaborations on ISTAT data (estimates).

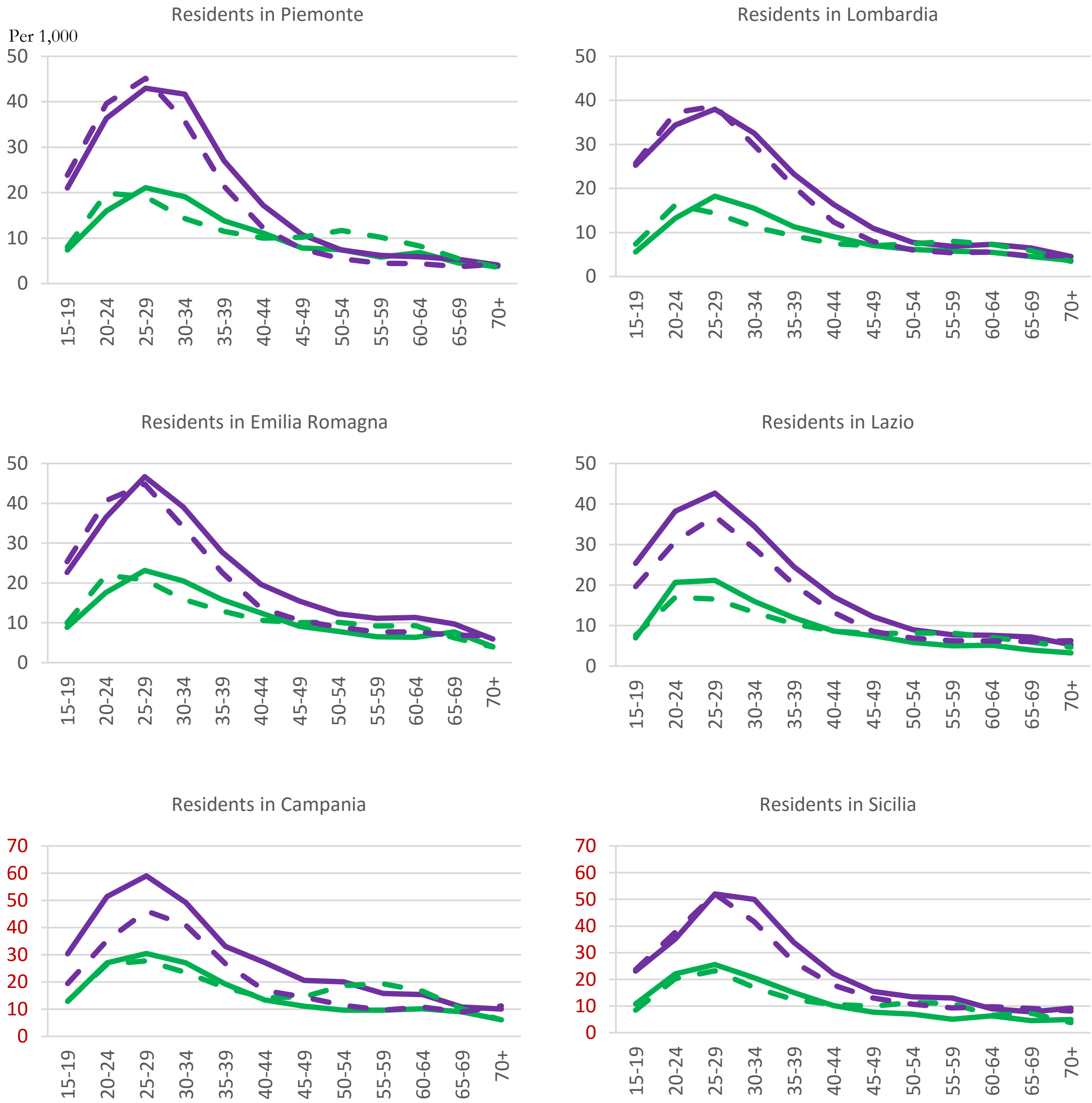
Appendix

Fig. A.1.1 Specific emigration rates (per 1,000) between regions by age (15 years and older), gender and place of birth of selected region of residence (before the migration): total resident population, natives and born abroad. Italy 2011-2013



Source: our elaborations on ISTAT data (estimates).

Fig. A.1.2 Specific emigration rates (per 1,000) between regions by age (15 years and older), gender and place of birth of selected region of residence (before the migration): born in another region, born abroad. Italy 2011-2013



Source: our elaborations on ISTAT data (estimates).

CHAPTER 2

INTERNAL MIGRATION IN ITALY BETWEEN 2002 AND 2013: AN APPLICATION OF THE MULTIREGIONAL LIFE TABLE USING THE PLACE OF BIRTH DEPENDENT APPROACH

2.1 Introduction

Since the mid-nineties, migratory behaviour on the Italian peninsula has significantly changed (Crainz 1998; Golini and Reynaud 2010). The origins and destinations of the flows, which were previously characterised by a clear prevalence of moving from the South to the Centre-north (Fofi 1975; Marini and Busetta 2005), are now much more heterogeneous and complex (Casacchia and Strozza 2000; Bonifazi and Heins 2017). The new attractiveness of the Northeast and the growth of shifts between the Northeast and Northwest have led to an increase in non-traditional migratory trajectories (Bubbico et al. 2011). Not only have migratory flows changed, but also the characteristics of the individuals that gave birth to such mobilisation. In the past, internal migration was more concentrated among relatively young adults, but in recent years their age profile has changed (Bonifazi, Heins and Tucci 2012). In particular, if, on the one hand, there has been an ageing of the migrating population, on the other hand, an increasingly important role has been played by young graduates, fuelling a very lively discussion about the most qualified part of the population escaping from the South of Italy (Piras 2007; Impicciatore and Tuorto 2011). During the same period, females increased their internal migration to fill the gender gap in internal migration between Macroregions (Northwest, Northeast, Centre and South), which in the past was predominately men (Bartolomeo and Golini 2010; Bertolini 2014).

In light of these recent changes, much obviously remains to be studied. The international literature has already shown that the place of birth plays a very important role in determining migration choices both internally and abroad (Long and Hansen 1975). However, Italian research tends to ignore this variable, with exceptions (Impicciatore and Strozza 2016). Following the same path as these works and other international literature, we propose an approach that outlines the role played by the place of birth analysed by gender and age. The model used is the multiregional model place of birth-dependent approach. In other words, the multiregional model of Rogers (1973) considers the place of birth of whoever migrates (Ledent 1980).

Our goal is to provide accurate measurements of internal migration, noting in particular the years of life expectancy for each birth cohort living in each Macroregion. We will ask, in particular, whether inserting the place of birth actually makes a contribution to research on the subject. How does internal migration differ if it is distinguished by place of birth? What profile does migration take if it jointly distinguishes gender, age, and birth cohorts? How has the ability to absorb years of life expectancy from other birth cohorts changed in each Macroregion in the last 15 years? What gender differences emerge for each birth cohort? How have internal migrations changed over the considered period?

The chapter is organised in the following way: in the next section a brief description of Italian migration between Macroregions is given; in the following section the chapter briefly reviews the literature on the multiregional model of place of birth-dependent approach. This is followed by a section describing the sources of data and the research methodology. In the last section, the results obtained through the application of the multiregional model are discussed. Finally, the chapter offers some conclusive considerations.

2.2 Internal migrations between Macroregions in Italy

The twenty years between 1955 and 1975 are those in which migration from the South to the rest of Italy became more noticeable (Golini 1974; Pugliese 2002). An explanation for this intensity of migration was, on the one hand, the abandonment of the rural areas in favour of urban centres and, on the other, the success of the great industry in Northwestern Italy, the most attractive migration destination for the South (Bubbico *et al.* 2011). In those years, an important role was played by the Lazio region (particularly Rome) which attracted flows mainly from Abruzzo, Campania, Puglia and Sardinia. In this case, the shifts were primarily noticeable in the field of public administration and construction (Bonaguidi 1988; Primavera 2002). In the 1970s and 1980s, the downsizing of economic growth and financial difficulties in Italy led to a reduction of migration between Macroregions and a growing lack of interest by scholars in this field of study (Bisogno 1997; Bonifazi 1999; Bonifazi, Heinz and Tucci 2014). In the early 1990s, an economic recovery led to a non-negligible growth in industrial equipment in Italy. During this period, industrial growth was no longer focused solely on the Northwest, but also on the Northeast. For this reason, internal migration continued to grow again, mainly thanks to flows from the South (Bonifazi and Heins 2017) and the movement of immigrants (Casacchia *et al.* 2010; Bonifazi, Heinz and Tucci 2012). At the beginning of 2000, the trend was still increasing and migration flows were similar to those of the previous decade. In particular, migratory flows were no longer concentrated solely in the Northwest. At the same time, the central Macroregion continued to be an important destination, while the Northeast increased its attractiveness. The increase of temporary work contracts, the growing importance of the services sector and small businesses also led to Northeast areas becoming important destinations of flows (De Santis 2010; Crisci and Di Tanna 2016). In recent years, in fact, short-range shifts have increased, which have given new life to migrations between the Northwest and Northeast. In 2008/2009, because of the economic crisis, internal migration suffered another setback, before returning to pre-crisis levels in subsequent years (Bonifazi 2015; Crisci 2017).

In those years, the internal migration of residents in Italy was also characterised by a change in the patterns for age of migration. The emigration rate among young people, compared with previous years, grew intensely. In total, the number of those who abandoned the South from 1995 to 2008 were about one million people aged between 20 and 40 (Cantalini and Valentini 2012). Yet, while in the nineties those individuals between 20 to 25 years of age had the highest propensity to migrate, in the following decade it was individuals between 25 and 30 years that had the highest propensity to migrate (Svimez 2009). Distinction of age at migration, types of trajectories, returns to the Macroregion of origin are the variables at the centre of the current study of internal migration research in Italy. In the next sections, we will try to contribute to the analysis of internal migration using the Macroregion of birth of those who change residence. To do this, we will use Rogers' multiregional life table model (1973).

2.3 The multiregional life table by Macroregion of birth

The traditional life table is a central concept in demography. Its use allows us to follow the survivorship of a closed group of people born at the same time. Such a cohort of people decreases over time until its extinction with the death of the last individual (Livi Bacci 1999). The key element of this instrument is the certainty of the irreversibility of the transition from surviving to deceased status (Preston, Heuveline and Guillot 2001). There are extensions of the life table, in particular the multiple decrement life table, which allows one to distinguish between different causes of death (Land and Rogers 1982).

However, the traditional life table does not allow us to follow the transitions of repeatable events. In other words, it does not permit us to follow people who have moved from one state to another and to analyse their subsequent experiences (Ledent 1980). A single-region life table shows only the life expectation of people who remain in one particular region, and migration is completely disregarded (Rogers and Willekens 1986). More complex tables are able to overcome this limitation, taking into account not only irreversible events, but also renewable and subsequent events, through the construction of a table characterised by a plurality of inputs and outputs (Rogers 1973). These tables, also called increment-decrement life tables, allow us to study marriage and divorce, employment, birth, and internal migration. In the latter case, we refer to multiregional tables (Rogers 1973), which is the subject of this study. Many different varieties of migration data have been employed as input to the multiregional life table and several methods of converting these migration data and associated mortality data into the probabilities needed in the life table have been suggested (Rees and Wilson 1975; Rogers and Ledent 1976; Ledent 1978). There are many applications of the multiregional model (Ledent and Rees 1980), and the strength of these results has been largely demonstrated with respect to those resulting from the construction of traditional measures such as migration rates, both total and per age (Philipov and Rogers 1981; Halli and Rao 1992; Jozwiak 1992).

In general, multiregional tables are based on two rigorous assumptions. On the one hand, the homogeneity of the population and, on the other, that the population follows the rules of the Markov chain model (Ledent 1980). In other words, the transition from one state to the next, by the observed population, depends only on the immediately preceding state (in our case survivorship and migration) and no account is taken of the history that determined it. Another important element to consider is that the multiregional life tables are built for contemporaries (Rogers 1995). Indeed, a longitudinal approach would require a great deal of information with huge detail that are, at present, rarely (if ever) provided by the national statistical offices. Therefore, the kind of information used to construct such tables plays a crucial role. Ordinary multiregional tables, however, are characterized by a strong element of approximation; they are constructed based on the place of residence of the population (and not the place of birth). In addition, the starting cohort of the traditional table is considered a birth cohort although it is constructed without using information on the place of birth of individuals (Willekens and Rogers 1978; Rogers 1995). Yet, as has been widely demonstrated, the propensity to migrate depends on the place of birth of the individuals (Long and Hansen 1975) and therefore it is very important to take this variable into account. The multiregional table built in this section is defined as the "place of birth dependent approach" (Ledent 1980; Rogers 2015) to distinguish it from that built through the traditional approach based only on the place of residence (place of birth independent approach).

In Italy, life tables are built precisely through the traditional method based on the place of residence while neglecting the place of birth (Bertino *et al.* 2015). This instrument is largely used to make demographic forecasts in national official statistics (ISTAT 2017). However, official Italian statistics do not provide the resident population separated by place of birth, except for the years of the census. The aim of this research is to investigate internal migration by using the multiregional model of place of birth-dependent approach. Therefore, as explained in detail in the next section, a preliminary assignment of the region of birth to the Italian population was required for all the years that make up the 2002-13 period.

The multiregional life table requires the availability of stock data on the resident population and flow data, in particular births, deaths, immigration and emigration both inside and outside the country. We propose an application of the multiregional life table in the most recent version, that is, it takes the place of birth of both the resident population and the migratory flows into account. However, as mentioned above, the National Statistical Institute (ISTAT) only provides the population by region of birth in the census years (in our reference period 2001 and 2011). Therefore, a preliminary allocation of the region of birth to the Italian population during the period 2002-13 was necessary (see chapter 1 for a detailed explanation of the procedure for allocating the region of birth to the resident population during the period considered in this study).

The time period chosen for reference ranges from 1 January, 2002 to 1 January, 2013. We chose to divide this period into four triennials (2002-2004, 2005-2007, 2008-2010, 2011-2013) and work with Macroregions (Northwest, Northeast, Centre and South) both with respect to residence and place of birth. This aggregation assured us that while dividing our population and internal migration flows, apart from gender and age, even by Macroregion of birth, the frequencies obtained were strong enough to ensure statistically valid results. In particular, this aggregation assured us that flows between Macroregions were never equal to zero. In line with the above, we chose single years of age. However, as explained in the first chapter, the estimated population (distinct by region of birth) aged more than 70 years old showed relatively high differences compared to the official statistics provided by the ISTAT. Therefore, we have decided to create an open-ended class (70 years old and more) to obtain the highest possible adherence to the data released by official ISTAT statistics.

After obtaining the distinct population by Macroregion of birth, it was possible to move to the multiregional table using Rogers' suggested formulas. In our annotations we will use "i" to indicate the Macroregion of origin and "j" the Macroregion of destination of the internal migration flows[6]. We will refer always to "origin" to indicate the Macroregion where the migration flows starts; conversely we will use the locution "place of birth" to indicate where individuals are born. In other words, we will never use the locution "origin" to indicate the birthplace.

The first necessary operation was to determine mortality and emigration rates by age. We calculated the specific mortality rates for each origin of migration flows (i), sex (s), age (x), Macroregion of birth (b) and for each of the 4 triennials (t). The annotation "i" represents both the Macroregion of origin of the emigration and the place of residence of the population considered[7]. We used the traditional formula with the total number of deaths (D) divided by the corresponding average population ($\overline{\mathrm{P}}$) [8]:

$$ {}^{b}m_{i}\ (x) = \frac{{}^{b}D_{i}\ (x)}{{}^{b}\overline{P}_{i}\ (x)}; \qquad (11) $$

[6] In order to use annotations as similar as possible compared to Rogers' formulas, in this chapter we will change the placement of superscripts and subscripts. Equally, we will place the age in brackets on the right side of the capital letter (like in Rogers' annotations).

[7] In order to avoid reducing the formalization, in this chapter (unlike the annotations used in the rest of the thesis) we will consider the Macroregion of residence (r) equal to the Macroregion of origin of internal emigration (i). Therefore, r = i.

[8] In order to avoid reducing the formalisation, we chose to show a procedure that includes three areas, although in our case we considered four territorial areas (Northwest, Northeast, Centre and South). However, even with four territorial areas, the formulas remain the same, but the biometric variables produced increase. This strategy has allowed us not only to make formulating the formulas easier, but also to avoid deviating from the references used by Rogers (1995), who adopts the same strategy. From here onwards, we will use the same approach to show the remaining equations for obtaining biometric variables.

Secondly, with reference to the calculation of the specific emigration rate (er[9]) by age (x), origin (i) and destination of migration flows (j), the emigration (E) has been taken into account using the following formula:

$$ {}^{b}er_{i,j}(x) = \frac{{}^{b}E_{i,j}(x)}{{}^{b}\overline{P}_{i}\ (x)} \tag{12} $$

with $j \neq i$

This is the first time that an Italian multiregional table has been built in such detail despite the fact that, as already indicated, it is generally accepted that the propensity to migrate depends on migrants' place of birth (Long and Hansen 1975; Ledent 1980). Therefore, it is very important to keep this variable in mind to achieve meaningful results. Once the rates were obtained, it was possible to apply the passage formulas to obtain the probability series (death, emigration, and permanence).

As for the calculation of the probabilities of death (q), we distinguished two different formulas, one relative to the class of 0 years of age and the second one referring to all other age classes. With reference to the first case (0 years), the formula applied was as follows:

$$ {}^{b}q_{i}\ (0) = \frac{{}^{b}D_{i}\ (0)}{{}^{b}B_{i}}; \tag{13} $$

"D" represents the total deaths and "B" represents the total births in each Macroregion.

For all the other ages, we used the equation identified by Rogers (1995), which takes into account not only the specific mortality rate (m), but also the specific emigration rate (er). Therefore, the probability that an individual of x years (excluding 0) born in a Macroregion (b), resident in a Macroregion (i) dies before x+1 year is given by:

$$ {}^{b}q_{i}\ (x) = \frac{{}^{b}m_{i}\ (x)}{\{1+0.5[\,{}^{b}m_{i}\ (x)+\sum_{j=1}^{3}\ {}^{b}er_{i,j}(x)]\}}; \tag{14} $$

with $j \neq i$ and $x \neq 0$

In other terms, in the formulas proposed by Rogers in the calculation of the probability of death of a multiregional table, consideration is also given to the probability of emigrants dying if they have remained in a mentioned territory[10].

The procedure for calculating the probability of emigrating (p) is similar and in this case two different procedures were introduced. The first one referred to the class of 0 years, the second to the remaining ages.

At 0 years, the formula becomes:

$$ {}^{b}p_{i,j}(0) = \frac{{}^{b}E_{i,j}(0)}{{}^{b}B_{i}}; \tag{15} $$

with $j \neq i$

[9] We used "er" to indicate the emigration rate instead of "e" because we used the annotation "e" to indicate the life expectancy.
[10] As a "mixed" extinction regime (simultaneously playing a role as disturbing and competing events: see Rogers 2015), in the denominators of multiregional probability formula, there are no international migrations.

In other age classes, the probability that an individual of x years born in a Macroregion b, residing in a Macroregion i, survives and is observed in the j Macroregion, is given by a formula that takes into account both specific emigration (er) and mortality (m) rates:

$$ {}^{b}p_{i,j}(x)=\frac{{}^{b}er_{i}\ (x)}{\{1+0.5[\ {}^{b}m_{i}\ (x)+\sum_{j=1}^{3}\ {}^{b}er_{i,j}(x)]\}}; \qquad (16) $$

with j $\neq$i and x $\neq$0

A final step to close the matrix of table probabilities was to move to a residual calculation operation that returns the probability of remaining in a particular territory:

$$ {}^{b}p_{i,i}(x)=1-\sum_{j=1}^{3}\ {}^{b}p_{i,j}-\ {}^{b}q_{i}\ (x); \qquad (17) $$

Since death is unavoidable, the matrix of probabilities has been closed by making the probability of death equal to 1 for the final open age class (70 and older years) and, of course, the remaining probabilities equal to 0 (to emigrate and permanence).

At this point, it was possible to calculate the biometric variables of the table. With age 0, the root of the table was equal to 100,000 for the natives (those who reside in the Macroregion in which they were born) and equal to 0 for the non-natives (those who reside in a Macroregion other than the Macroregion of birth).

Using Rogers' annotations, the left subscript represents the status of individuals before the internal migration; conversely, the right subscript represents the status of individuals after their migration (for example, in this annotation ${}_{ix}l_{j}\ (y)$, "x" represents the age before the internal migration and "i" represents the Macroregion of residence before the migration; instead, "j" is the Macroregion of residence after this migration). The age placed in brackets represents the age after internal migration. In the following formulas, "y" in brackets represents the age after the internal migration when the age before the migration is different to the age after this movement (returning to the previous example, in this annotation ${}_{ix}l_{j}\ (y)$, x represents the age before the internal migration, y represents the age after the internal migration, with x$\neq$y). Conversely, "x" in brackets indicate the age after the internal migration when the age before the migration is equal to the age after this movement (for example ${}_{ix}l_{j}\ (x)$ if the age before internal migration is equal to the age after this movement). We will use "j" and "k" to distinguish two different Macroregions of destination. When we use the point (.) we will indicate that we consider all the Macroregions jointly.

The series of the number surviving to the beginning of the age interval (l) is then completed through the following equations identified by Rogers:

$$ {}_{ix}^{b}l_{jk}(y)={}_{ix}^{b}l_{j}\ (y)\ {}^{b}p_{jk}(y); \qquad (18) $$

$$ {}_{ix}^{b}l_{.}\ (y)=\sum_{k=1}^{3}{}_{ix}^{b}l_{kj}\ (y); \qquad (19) $$

After calculating the survivors' series, we moved to the deaths of the table (d). The number of deaths expected between the age y and age y + 1 among the ${}_{ix}^{b}l_{j}\ (y)$ individuals who live in the Macroregion j at the age y and who previously lived in Macroregion i at age x is provided by the following expression:

$$ {}_{ix}^{b}d_{j}\ (y)={}_{ix}^{b}l_{j}\ (y)\ {}^{b}q_{j}\ (y); \qquad (20) $$

L represent the total number of years lived in the Macroregion j (or k) among the ages y and y+1 by individuals observed in the Macroregion j (or k) at age y who lived in the Macroregion i at age x. Therefore, the formula for calculating this biometric variable required the use of the number of years lived in the age interval (a) which is an age function and was derived from the official ISTAT statistics:

$$ {}^{b}_{x}L_{ii}\,(y) = a_{ii}\,(y) * {}^{b}_{ix}l_{ii}\,(y) + a_{i.}\,(y) * {}^{b}_{ix}d_{i.}\,(y) + a_{ij}\,(y) * {}^{b}_{ix}l_{ij}\,(y) + +a_{ik}(y) * {}^{b}_{ix}l_{ik}(y) \qquad (21)$$

$$ {}^{b}_{ix}L_{ij}\,(y) = [1 - a_{ij}\,(y)] * {}^{b}_{ix}l_{ij}\,(y)\,; \qquad (22)$$

$$ {}^{b}_{ix}L_{.j}\,(y) = \sum_{k=1}^{3} {}^{b}_{ix}L_{kj}; \qquad (23)$$

In the case of the final open class, the formula adopted is as follows:

$$ {}^{b}_{ix}L_{.j}\,(70+) = \frac{{}^{b}_{ix}l_{.j}\,(70+)}{{}_{ix}m_{.j}\,(70+)}; \qquad (24)$$

The value ${}_{ix}m_{.j}(70+)$ refers to the mortality rate after 69 years, also provided by the National Institute of Statistics (ISTAT)[11].

Similarly to uniregional tables, the cumulative sum of the total number of years lived (T) is a function of L and is obtained by the following formula, where ω represents the final age:

$$ {}^{b}_{ix}T_{j}\;(y) = \sum_{k=x}^{\omega} {}^{b}_{ix}L_{.k}\,(y); \qquad (25)$$

Finally, the life expectancy (e) from the age y in the Macroregion j of the cohort formed in i at x age is obtained as follows:

$$ {}^{b}_{ix}e_{j}\;(y) = \frac{{}^{b}_{ix}T_{j}\;(y)}{{}^{b}_{ix}l_{.}\;(y)}; \qquad (26)$$

$$ {}^{b}_{ix}e_{.}\;(y) = \frac{\sum_{j=1}^{3} {}^{b}_{ix}T_{j}\;(y)}{{}^{b}_{ix}l_{.}\;(y)} \qquad (27)$$

2.4 The survivorship history of the birth cohort

The construction of the multiregional table has allowed us to follow the survivorship and the migration history of four birth cohorts in relation to the four Italian Macroregions (Northwest, Northeast, Centre and South) from 2002 to 2013. As already stated, according to the international literature, the place of birth dependent approach gave us the advantage of being more accurate (Long and Hansen 1975; Ledent 1980)[12]. This approach enables not only following the survivorship history of the various cohorts, but

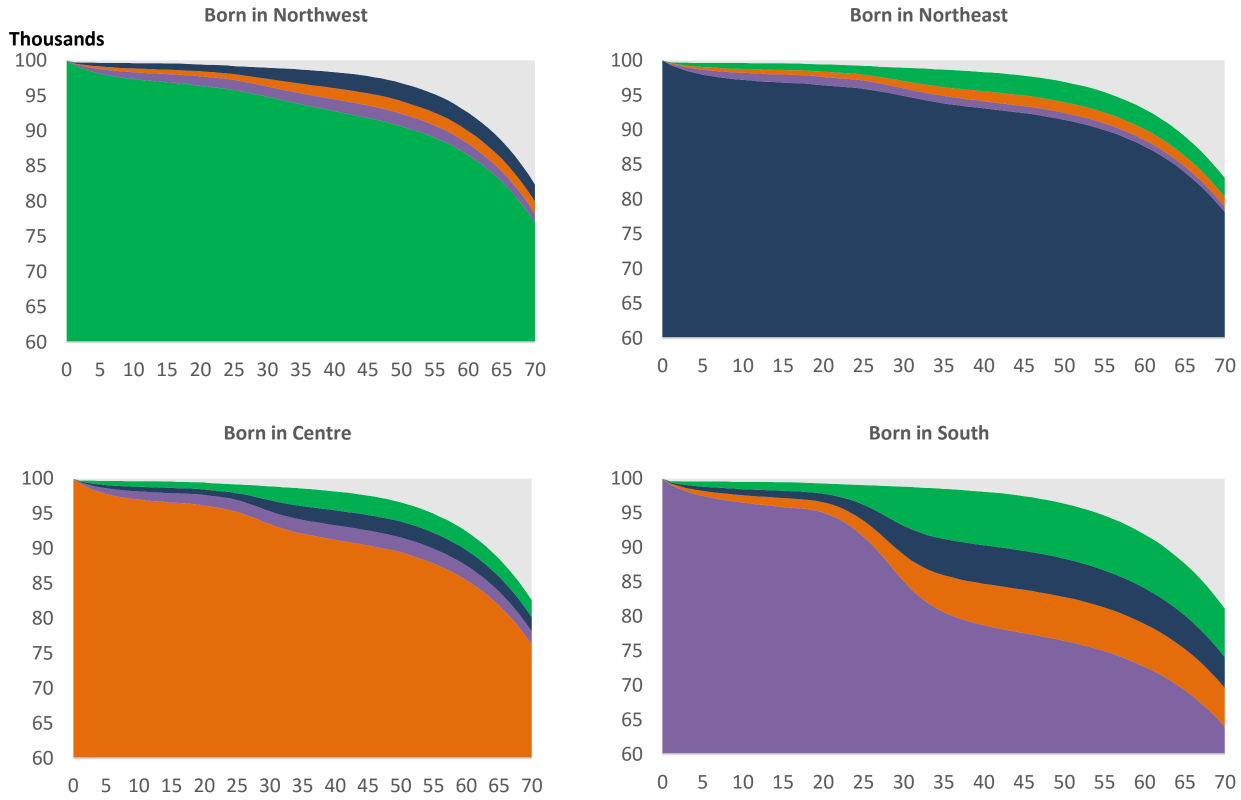
[11] We recall that the population we estimated (distinguished by Macroregion of birth) after the age of 70 differs more than the younger ages from the values of the official ISTAT statistics (see chapter 1). Therefore, with regard to the open class (aged 70 and over), we preferred to use the official ISAT mortality rate instead of the one we obtained using the distinct population by Macroregion of birth. This procedure, consistent with the traditional Rogers' model (2015), has assured us of greater confidence of the results.

[12] Making a comparison (albeit interesting) between the results obtained using the two models (dependent and independent approach) falls outside the scope of this paper. Therefore, we chose to refer to the international literature that has already highlighted the differences between the two models and to refrain from further comparison.

also keeping track of their migration history from a Macroregion to another one. We can study their internal migration with superior accuracy to the analysis conducted using the traditional rates of emigration (Philipov and Rogers 1982).

Before moving on to look at life expectancy, it is interesting to explore the survivorship profiles distinctly by Macroregion of birth (Rogers 1995). In a dynamic sense, all cohorts have had such a trend. In fact, survivors outside the Macroregion of birth first dropped in 2005-2007 and in 2008-2010 and then reached values higher than the first three years (2002-2004) in the 2011-2013 period. This evolution is observed in all birth cohorts, both for males and females. Figure 2.1 help us to understand the male survivorship of the last time interval (2011-2013). On the vertical axis, the table indicates the survivorship by Macroregion (values per thousands) and on the other axis the age. As described above, the root of the table is 100,000 individuals. The Figure helps us to follow the hypothetical history (both migratory and death-related) of the birth cohort formed by 100,000 individuals from the age of 0 to 70. In this way, for each age and for each birth cohort, the sum of survivors by Macroregion of residence plus the cumulative deaths always returns to a total of 100,000[13]. At this point it will be clear that at age 0 there are no deaths and the cohort of 100,000 individuals is all surviving in the Macroregion of birth; vice versa after age 70 all 100,000 individuals have died.

Fig. 2.1 Survivorship of males distinctly by age, Macroregion of residence and Macroregion of birth. Italy 2011-2013. Values per thousands



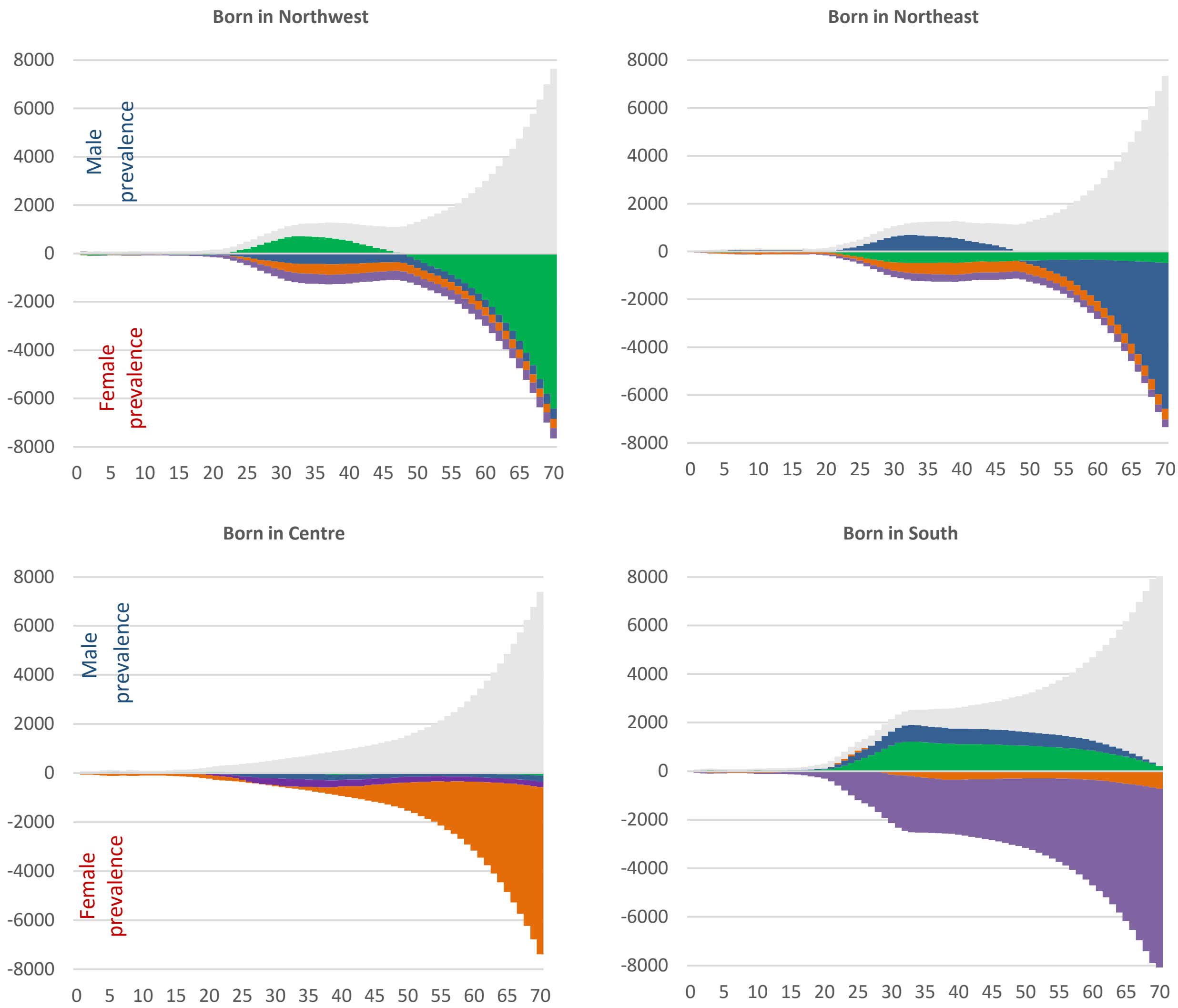
Survivors in: Northwest Northeast Centre South Cumulative deaths
Source: our elaborations on ISTAT data (estimates).

[13] In Figure 2.1 we chose to start the y-axis at 60,000 to better understand the figure.

Figure 2.1 shows that the males born in the Northeast is the cohort mean with the fewest individuals outside the birth area. Also, when they leave the Macroregion of birth, most of their migration flows are concentrated towards the Northwest. On the other hand, the cohort of males born in the central regions and those born in the Northwest show a similar pattern of migration. They have a certain equal-distribution in the Macroregions (outside the Macroregion of birth). As expected, the cohort of males born in the South is the one that has the greatest amount of survivorship outside the macro-area of birth. Compared to the other Macroregions of birth, in percentage, in fact, the values are almost triple.

Female survivors show similar profiles, however, there are important gender differences to highlight. Figure 2.2 is obtained by subtracting survivorship by age of males to corresponding females (males minus females), distinctly by birthplace in 2011-2013. In this way, when the values in Figure 2.2 are placed on the negative side of the y-axis, the values for females exceed those of the males. The opposite happens on the positive side.

Fig.2.2 Difference by gender (males minus females) of survivorship and cumulative deaths distinctly by age, Macroregion of residence and birth. 2011-2013



Survivors in: Northwest Northeast Centre South Cumulative deaths
Source: our elaborations on ISTAT data (estimates).

In essence, the graph obtained is strongly influenced by the greater mortality of males compared with females. For this reason, for all cohorts of birth there is a prevalence of the cumulative death on the positive side of the y-axis. However, based on what has been said, the cases in which survivors in other sections are predominantly male are particularly interesting. Having highlighted these important premises, we can see that in the central regions, except for a small prevalence of male survivors in the Northwest up to 26 years old, the prevalence of the cumulative deaths is still predominant. In both Macroregions of the North (Northwest and Northeast), up to about age 50, more males than females survive in the Macroregion of birth. The birth cohort in the South stands out as following a completely different pattern. Despite male predominance in deaths, males born in the South that survive in the Northwest and Northeast are prevalent in all ages considered (including the older ones).

Considering this, though interesting, the deaths make it difficult to interpret the migration. The study of life expectancy allows us to go beyond what we have just outlined and to draw sounder conclusions on the migration between Macroregions of each birth cohort.

2.5 The life expectancy of each Macroregion by birth cohort

The construction of the multiregional table, as shown in section 2.4, has enabled the analysis of life expectancy for each birth cohort. In Table 2.1, life expectancy at birth for each birth cohort is studied without distinction in which Macroregions the years of life expectancy are lived (for example, the life expectancy of those born in the total Northwest, without distinguishing in which Macroregion such a cohort lives its years of life expectancy at birth).

The differences between the values obtained with the multiregional model and the life expectancy derived from the ISTAT tables (traditional uniregional model) are relatively small. The major differences focus on the first and last three years. Between 2002 and 2004, the major differences affect the Northwest for both sexes (-0.97 for males and -1.17 for females). In 2011-2013, however, the highest difference relates to the South, especially for females (0.50 for males and 0.84 for females). Overall, the observed differences can be considered small. They are, in the first place, due to the different time intervals considered. In fact, the multiregional model is built on four triennials, while the ISTAT data relates to the last year of the corresponding three-year period. A second element of difference is that the multiregional table is built on the basis of the Macroregion of birth, whereas ISTAT data refer to the resident population in their respective allocations. Finally, international research has already highlighted that the differences between life expectancy at birth (from now on e_0) in uniregional and multiregional life tables are equal to the values included between -1.5 and +1.5 (Rogers 1995).

Table 2.1 confirms what is already known, that the e_0 are increasing over time for both males and females and the gender differential is decreasing over time in all birth cohorts. What is surely more interesting is to investigate where each birth cohort lives their years of life expectancy, an operation that of course can only be achieved by using the multiregional life table.

Tab. 2.1 Comparison of life expectancy by Macroregion of the multiregional table and the Macroregion of residence by ISTAT. Italy 2002-13.

Birth cohort	Males			Females		
	Multiregional	ISTAT	Differences[(a)]	Multiregional	ISTAT	Differences[(a)]
	2002-2004	**2004**		**2002-2004**	**2004**	
Nordwest	76.83	77.80	-0.97	82.63	83.80	-1.17
Nordeast	77.48	78.26	-0.77	83.42	84.16	-0.74
Centre	77.95	78.27	-0.32	83.42	83.70	-0.28
South	77.56	77.62	-0.06	82,99	82.97	0.03
	2005-2007	**2007**		**2005-2007**	**2007**	
Nordwest	78.40	78.70	-0.30	83.59	84.17	-0.59
Nordeast	78.83	79.11	-0.28	84.21	84.52	-0.30
Centre	79.05	78.96	0.08	84.52	84.19	0.32
South	78.55	78.02	0.53	83.32	83.09	0.24
	2008-2010	**2010**		**2008-2010**	**2010**	
Nordwest	79.07	79.35	-0.27	84.15	84.48	-0.32
Nordeast	79.40	79.78	-0.38	84.64	84.97	-0.33
Centre	79.56	79.46	0.10	84.53	84.44	0.09
South	78.88	78.70	0.17	84.10	83.62	0.48
	2011-2013	**2013**		**2011-2013**	**2013**	
Nordwest	79.70	80.04	-0.34	84.59	84.89	-0.30
Nordeast	80.12	80.36	-0.24	84.83	85.19	-0.35
Centre	80.03	80.04	-0.01	84.76	84.77	-0.01
South	79.66	79.16	0.50	84.75	83.91	0.84

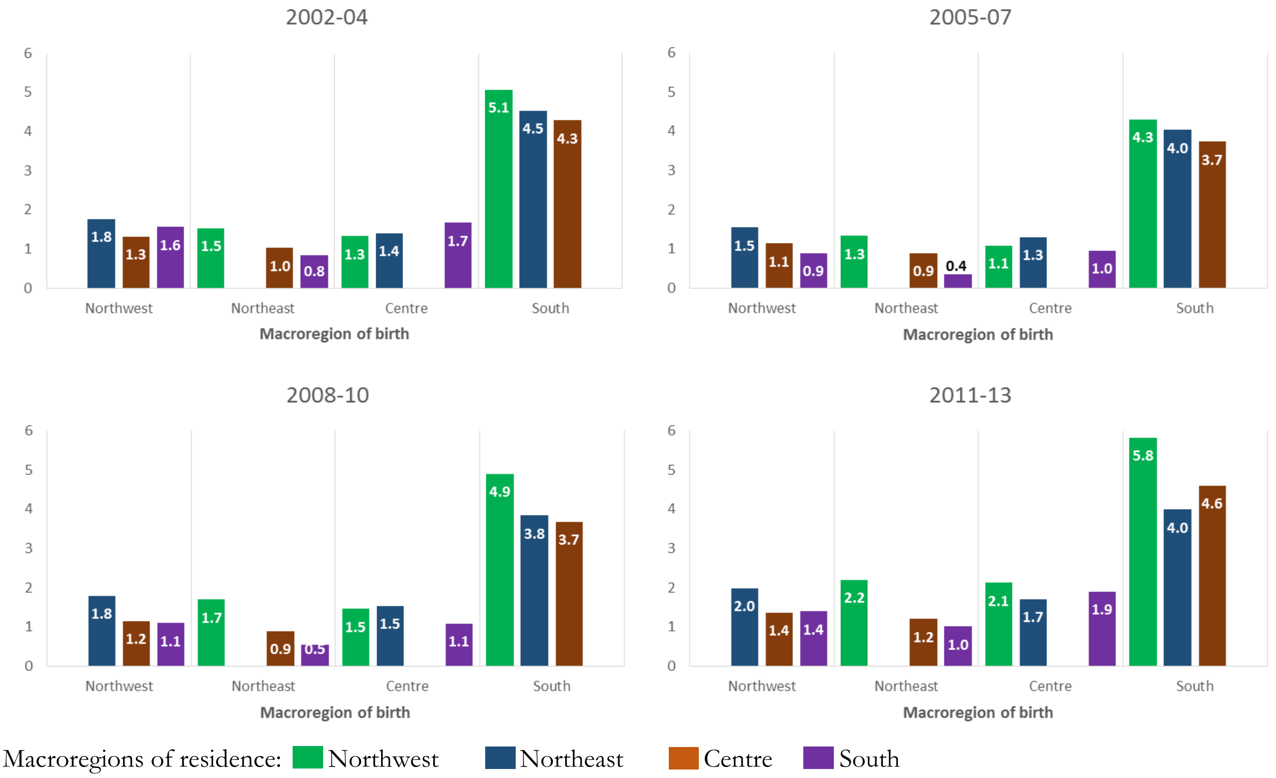
[(a)]ISTAT data minus Multiregional life table birth dependent approach data.

Source: our elaborations on ISTAT data (estimates).

Figure 2.3 shows, for males, the percentage of years of life expectancy at birth lived outside the birth Macroregion distinctly for each birth cohort. On the x-axis are the birth cohorts, while the Macroregions where the years of e_0 are lived are differentiated by colour. As predicted, the trend of time is the one described above with respect to survivorship: both for males and for females, the trend is decreasing from the first three years (2002-2004) to the second (2005-2007) and then reversed in the last three years (2011-2013).

Males born in the South in 2011-2013 live outside the birth Macroregion 14.4% of their e_0 (5.8% in the Northwest, 4.6% in the Centre and 4% in the Northeast). Considering the other birth cohorts, the percentages are much lower. Central Italy is the second Macroregion of birth for a life expectancy lived in another macro-area with a total of 5.7%, 8.2 percentage points less than in the South. They live 2.1% of e_0 in Northwest, the Macroregion that absorbs the highest percentage. Second place in the ranking is the South (1.9%), which shows an important role played by distance and returns (Bonifazi and Heins 2017). Born in the Northwest and in the Northeast make up to 4.7% and 4.4% of e_0. If, on the one hand, those born in the Northwest comprise the main share of e_0 in the Northeast (2%), in the same way, the cohort born in the Northeast mainly lives its e_0 in the Northwest (2.2%). Moreover, in all four-time periods considered the Northeast has the lowest e_0 lived in the South (1% in 2011-2013).

Fig. 2.3 Percentage of life expectancy at birth of males living in a Macroregion other than the Macroregion of birth. Italy 2002-13



Source: our elaborations on ISTAT data (estimates).

Figure 2.4 compares the percentage of male and female life expectancy at birth lived outside the Macroregion of birth. Using percentages, it was possible to control the highest mortality of males and to make more effective gender comparisons. When the rectangle is above the x-axis life expectancy at birth lived outside the Macroregion of birth is higher for males. The opposite is true when the rectangle is below the x-axis. For cohorts born in Northwest and Northeast females have higher percentages of years lived outside the Macroregion of birth. The gender differential for these cohorts also increased over time (from -0.5% in 2002-2004 to -0.7% for Northwest and -0.8% for Northeast in 2011-2013). The South, however, is traditionally characterised by migration related to searching for a job (Bonifazi and Heins 2017), and there is a clear male prevalence. It should be stressed, however, that in 2011-2013 the prevalence is higher in females than males if we consider central regions as the only destination. In addition, as shown in the graph, the gender differential in the birth cohort in the South falls from 0.7% in 2002-2004 to 0.5% in 2011-2013 (although with a fluctuating trend over time). Finally, the birth cohort in the central regions is characterised throughout the time interval with a greater gender balance.

Fig. 2.4 Percentages of life expectancy at birth lived outside the Macroregion of birth. Differences by gender (males minus females)[(a)]. Italy 2002-13

Macroregions of birth: Northwest Northeast Centre South

[(a)] When the rectangle is above the x-axis life expectancy at birth lived outside the Macroregion of birth is higher for males. The opposite is true when the rectangle is below the x-axis.

Source: our elaborations on ISTAT data (estimates).

In order to grasp the role played by age (x) in relation to migration between Macroregions, "temporary life expectancy" (Arriaga 1984) has been constructed. This indicator represents the life expectancy between two age groups and can be represented with the following formula:

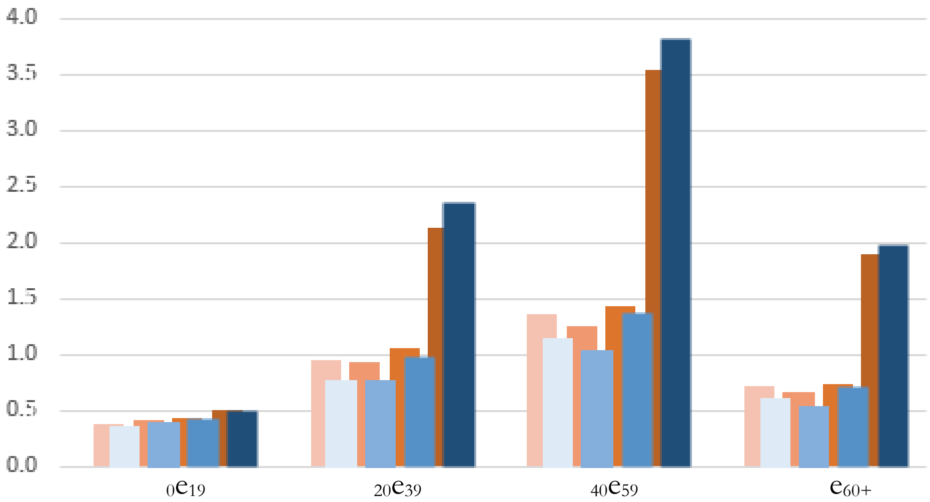
$$ {}^{b}_{i}e(x) = \frac{{}^{b}T(x) - {}^{b}T(x+n)}{{}^{b}l(x)}; \qquad (28) $$

In this case "n" represents a generic number of years.

Figure 2.5 shows the "temporary life expectancy" of the three-year period 2011-2013 of those who live years of life expectancy outside the Macroregion of birth distinctly by gender. Age classes distinguish young people (0-19 years), adults (20-39 years and 40-59 years) and finally, those who are about to leave the labour market or have already left (60 years and older). Note that life expectancy is not expressed as a percentage in this Figure, therefore, the comparison of males and females can only be made considering the lower mortality rates of females, especially concerning the elderly (see survivorship in previous section).

Individuals born in the South, in all age groups, have a temporary life expectancy higher than the other cohorts of birth for both males and females. The temporary life expectancy of the births in this Macroregion increases as the age increases and then decreases in the final age class. Individuals born in the central regions of Italy are ranked second in all age classes with a profile that resembles (by age) that of those born in the South. The profiles of the birth cohorts in the North are more varied. Individuals born in the Northeast take higher values than Northwestern births in the first class (0-19 years), however, the Northwest has a higher temporary life expectancy (compared to the Northeast) after 50 years. Turning to gender differences, we immediately notice a clear split between those born in the South and Centre-north Macroregions. In the latter Macroregion, female temporary life expectancy (out of the Macroregion of births) is higher than that of males. The model of the South is different. In this birth cohort, temporary life expectancies lived outside of Macroregion of birth by males are higher than those of females in all age classes, except for individuals 0-19 years old.

Fig. 2.5 Temporary expectancy (0-19, 20-39, 40-59, 60+) in a Macroregion of residence other than Macroregion of birth. Italy 2011-2013



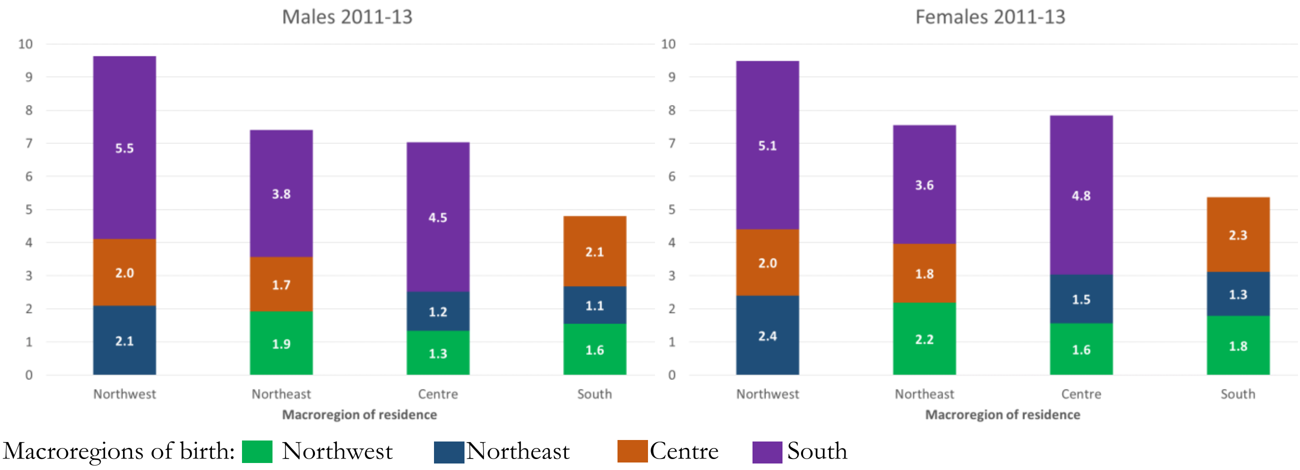
Females: Northwest Northeast Centre South

Males: Northwest Northeast Centre South

Source: our elaborations on ISTAT data (estimates).

What percentage of life expectancy at birth does each Macroregion absorb from each birth cohort? Figure 2.6 answers this question with reference to the period 2011-2013. Unlike the previous representations of life expectancy at birth, in Figure 2.6 on the x-axis are each of the Macroregions of residence (rather than birth). The percentages of e_0 absorbed from each Macroregion of birth are differentiated with different colours. As expected, it is the Northwest that most attracts those born in other Macroregions. Although, similarly to other Macroregions of residence, life expectancy quotas are absorbed above all from those born in the South. The percentages of e_0 absorbed from the central macro-area and from the Northeast in Northwest are worthy of note (around 2% for both males and females). The South, on the other hand, is the least attractive Macroregion in this regard. By shifting to gender differences, while for the males the second most attractive Macroregion is the Northeast (7.4% for males and 7.6% for females), for females it is the Centre (7.0 % for males and 7.9% for females).

Fig. 2.6 Life expectancy at birth absorbed from each Macroregion, other than that of residence. Italy 2011-2013



Source: our elaborations on ISTAT data (estimates).

2.6 Conclusion

The construction of the multiregional life table using the place of birth-dependent approach has allowed us to follow the migratory history and the survivorship of individuals born in the four Italian Macroregions. The obtained results, according to the international literature, are stronger than those traditionally obtained by using the area of residence (the place of birth-independent approach).

From the use of this approach, significantly different migratory patterns emerged for each cohort of birth. Those born in the Northeast show the lowest internal emigration compared to the other birth cohorts, with a large proportion of young people (0-19 years) moving to different Macroregions. They are the least likely to live their years of life expectancy at birth in the South. Indeed, those born in the Northeast move mainly to the Northwest. They are predominantly women, with a gender differential rising over time. Moreover, the important role played by distance is evident, as there is a significant predilection for the neighbouring macro-areas. Distance is less important for those born in the South.

The internal migration of the Northwest cohort is higher than that of the Northeastern. Those born in the Northwest concentrate their years of life expectancy in the Northeast especially, but the number of years lived in the South and in the Central regions are also important. The Northwest is particularly characterised as an area of attraction, showing, in 2011-2013, the ability to attract almost 10% of life expectancy at birth of those born in other Macroregions.

The Central Macroregion stands out from the previous cohorts of birth examined given the greater gender balance in migration to other Macroregions. This cohort is also characterised by an important presence in the South and for a homogeneous distribution in all other Macroregions.

The birth cohort in the South, of course, is the one that has the greatest number of years of life expectancy in other Macroregions. Interestingly, this cohort is the only one characterised by a male predominate migratory model. An increasing number of migrating females, however, have reduced the gender gap over time. Compared to 2011-2013, females are prevalent at younger ages (and therefore less tied to searching for a job) and in migration flows to Central Italy. It appears, as it turns out, that job-seeking migration continues to be a male prerogative, although females seem to bridge the gap over time.

From the results described so far, there is a need for further research. For example, in terms of examining the role played by distance, specifying the contribution provided by each region of birth and exploring how internal migration of each cohort depends on economic indicators (e.g., gross domestic product or unemployment rate).

Appendix

Tab A.2.1 Multiregional life table for males born in Northwest. Survivors and life expectancy by Macroregion of residence. Italy 2011-2013

Age	Born in Northwest									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
0	100,000	100,000	0	0	0	79.70	75.92	1.58	1.08	1.11
1	99,737	99,374	134	73	157	78.91	75.12	1.59	1.09	1.11
2	99,710	98,978	268	156	307	77.93	74.15	1.59	1.08	1.11
3	99,693	98,638	375	237	443	76.94	73.17	1.58	1.08	1.11
4	99,681	98,356	461	302	562	75.95	72.19	1.58	1.08	1.10
5	99,672	98,128	534	350	659	74.96	71.21	1.57	1.08	1.10
6	99,663	97,925	599	397	741	73.96	70.23	1.57	1.07	1.09
7	99,652	97,747	656	440	810	72.97	69.26	1.56	1.07	1.08
8	99,643	97,606	701	472	863	71.98	68.28	1.56	1.07	1.07
9	99,635	97,483	737	502	913	70.98	67.31	1.55	1.06	1.07
10	99,628	97,367	769	532	960	69.99	66.34	1.54	1.06	1.06
11	99,622	97,257	805	557	1,002	68.99	65.36	1.53	1.05	1.05
12	99,614	97,159	834	579	1,043	68.00	64.39	1.53	1.04	1.04
13	99,605	97,072	857	595	1,080	67.01	63.42	1.52	1.04	1.03
14	99,594	96,977	883	615	1,119	66.01	62.46	1.51	1.03	1.02
15	99,581	96,890	903	633	1,155	65.02	61.49	1.50	1.03	1.00
16	99,565	96,815	918	648	1,184	64.03	60.53	1.49	1.02	0.99
17	99,543	96,744	930	662	1,206	63.05	59.57	1.48	1.01	0.98
18	99,516	96,662	940	681	1,233	62.06	58.61	1.47	1.01	0.97
19	99,484	96,532	956	713	1,283	61.08	57.66	1.46	1.00	0.96
20	99,445	96,397	975	738	1,335	60.11	56.71	1.45	0.99	0.94
21	99,403	96,281	1,000	751	1,371	59.13	55.77	1.45	0.99	0.93
22	99,361	96,169	1,027	765	1,399	58.16	54.82	1.44	0.98	0.92
23	99,317	96,057	1,061	781	1,419	57.18	53.88	1.43	0.97	0.90
24	99,270	95,939	1,096	801	1,434	56.21	52.94	1.42	0.96	0.89
25	99,220	95,798	1,146	829	1,446	55.24	52.00	1.41	0.96	0.87
26	99,168	95,624	1,223	870	1,450	54.27	51.06	1.39	0.95	0.86
27	99,118	95,434	1,318	915	1,452	53.29	50.12	1.38	0.94	0.85
28	99,071	95,238	1,416	959	1,459	52.32	49.19	1.37	0.93	0.83
29	99,027	95,045	1,519	1,007	1,456	51.34	48.25	1.35	0.92	0.82
30	98,987	94,853	1,613	1,067	1,455	50.36	47.31	1.34	0.91	0.80
31	98,941	94,648	1,694	1,133	1,467	49.38	46.37	1.32	0.90	0.79
32	98,888	94,417	1,784	1,202	1,485	48.41	45.44	1.31	0.89	0.77
33	98,832	94,202	1,866	1,262	1,503	47.44	44.51	1.29	0.88	0.76
34	98,774	93,996	1,934	1,317	1,527	46.47	43.58	1.27	0.86	0.75
35	98,715	93,775	2,009	1,370	1,561	45.49	42.66	1.25	0.85	0.73
36	98,646	93,561	2,078	1,411	1,596	44.52	41.74	1.23	0.84	0.71
37	98,578	93,375	2,130	1,451	1,622	43.55	40.82	1.21	0.82	0.70
38	98,512	93,192	2,181	1,494	1,645	42.58	39.90	1.19	0.81	0.68
39	98,435	93,004	2,230	1,532	1,669	41.62	38.99	1.17	0.80	0.67

Tab A.2.1 (follows)

Age	Born in Northwest									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
40	98,346	92,810	2,275	1,564	1,698	40.65	38.08	1.15	0.78	0.65
41	98,253	92,605	2,317	1,604	1,727	39.69	37.17	1.12	0.76	0.63
42	98,154	92,411	2,357	1,639	1,747	38.73	36.26	1.10	0.75	0.62
43	98,042	92,218	2,396	1,666	1,762	37.77	35.36	1.08	0.73	0.60
44	97,913	92,018	2,429	1,691	1,774	36.82	34.47	1.05	0.72	0.58
45	97,778	91,827	2,459	1,712	1,780	35.87	33.58	1.03	0.70	0.56
46	97,631	91,629	2,485	1,731	1,785	34.93	32.69	1.01	0.68	0.55
47	97,461	91,424	2,509	1,745	1,784	33.99	31.81	0.98	0.67	0.53
48	97,266	91,197	2,527	1,759	1,783	33.05	30.93	0.96	0.65	0.51
49	97,043	90,941	2,544	1,774	1,784	32.13	30.06	0.94	0.63	0.49
50	96,796	90,661	2,564	1,782	1,788	31.21	29.20	0.91	0.62	0.48
51	96,525	90,361	2,589	1,788	1,788	30.30	28.35	0.89	0.60	0.46
52	96,236	90,060	2,606	1,790	1,780	29.39	27.50	0.86	0.58	0.44
53	95,927	89,748	2,614	1,797	1,769	28.48	26.65	0.84	0.57	0.43
54	95,584	89,416	2,617	1,802	1,751	27.58	25.80	0.81	0.55	0.41
55	95,199	89,036	2,623	1,808	1,732	26.69	24.97	0.79	0.53	0.39
56	94,778	88,632	2,630	1,807	1,709	25.80	24.15	0.77	0.52	0.38
57	94,316	88,196	2,629	1,803	1,688	24.93	23.33	0.74	0.50	0.36
58	93,792	87,696	2,629	1,801	1,667	24.07	22.52	0.72	0.48	0.34
59	93,218	87,158	2,629	1,796	1,635	23.21	21.72	0.69	0.47	0.33
60	92,607	86,580	2,630	1,791	1,606	22.36	20.93	0.67	0.45	0.31
61	91,951	85,947	2,625	1,796	1,583	21.52	20.14	0.65	0.43	0.30
62	91,217	85,250	2,615	1,792	1,560	20.69	19.36	0.62	0.42	0.28
63	90,410	84,504	2,600	1,779	1,526	19.87	18.59	0.60	0.40	0.27
64	89,558	83,713	2,580	1,765	1,500	19.05	17.83	0.58	0.39	0.25
65	88,618	82,827	2,562	1,751	1,477	18.25	17.08	0.55	0.37	0.24
66	87,562	81,829	2,541	1,741	1,450	17.46	16.35	0.53	0.36	0.23
67	86,415	80,753	2,514	1,730	1,418	16.69	15.62	0.51	0.34	0.21
68	85,167	79,582	2,487	1,713	1,385	15.92	14.91	0.49	0.32	0.20
69	83,820	78,326	2,458	1,688	1,348	15.17	14.21	0.47	0.31	0.19
70	82,388	77,003	2,424	1,652	1,309	14.43	13.51	0.44	0.29	0.17

Source: our elaborations on ISTAT data (estimates).

Tab A.2.2 Multiregional life table for males born in Northeast. Survivors and life expectancy by Macroregion of residence. Italy 2011-2013

Age	Born in Northeast									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
0	100,000	0	100,000	0	0	80.12	1.76	76.58	0.96	0.81
1	99,732	150	99,347	84	150	79.33	1.77	75.79	0.97	0.81
2	99,700	301	98,895	180	325	78.36	1.76	74.82	0.96	0.81
3	99,682	428	98,507	269	478	77.37	1.76	73.84	0.96	0.80
4	99,669	526	98,198	340	604	76.38	1.76	72.87	0.96	0.80
5	99,659	600	97,954	399	706	75.39	1.75	71.89	0.96	0.79
6	99,649	664	97,739	449	797	74.39	1.74	70.92	0.95	0.78
7	99,644	721	97,563	489	870	73.40	1.74	69.94	0.95	0.77
8	99,638	768	97,420	518	932	72.40	1.73	68.96	0.94	0.76
9	99,632	801	97,301	543	987	71.41	1.72	67.99	0.94	0.76
10	99,627	833	97,201	563	1,030	70.41	1.71	67.02	0.93	0.75
11	99,621	871	97,091	586	1,073	69.41	1.71	66.05	0.93	0.73
12	99,613	901	96,998	606	1,108	68.42	1.70	65.08	0.92	0.72
13	99,607	922	96,927	626	1,131	67.42	1.69	64.11	0.91	0.71
14	99,598	944	96,862	642	1,150	66.43	1.68	63.14	0.91	0.70
15	99,585	959	96,805	654	1,167	65.44	1.67	62.18	0.90	0.69
16	99,573	972	96,761	665	1,175	64.45	1.66	61.21	0.89	0.68
17	99,551	980	96,712	678	1,181	63.46	1.65	60.26	0.89	0.67
18	99,516	988	96,633	699	1,196	62.48	1.64	59.31	0.88	0.65
19	99,477	1,007	96,524	729	1,217	61.51	1.63	58.36	0.87	0.64
20	99,438	1,042	96,413	756	1,227	60.53	1.62	57.41	0.87	0.63
21	99,397	1,079	96,323	776	1,219	59.56	1.61	56.46	0.86	0.62
22	99,358	1,115	96,244	790	1,209	58.58	1.60	55.52	0.85	0.61
23	99,318	1,160	96,148	808	1,203	57.60	1.59	54.57	0.85	0.59
24	99,274	1,207	96,046	823	1,198	56.63	1.58	53.63	0.84	0.58
25	99,226	1,276	95,920	841	1,189	55.66	1.57	52.69	0.83	0.57
26	99,169	1,371	95,753	867	1,177	54.69	1.56	51.75	0.82	0.56
27	99,114	1,500	95,553	898	1,164	53.72	1.54	50.81	0.81	0.55
28	99,068	1,646	95,347	933	1,141	52.74	1.53	49.87	0.80	0.54
29	99,021	1,787	95,141	974	1,118	51.77	1.51	48.94	0.79	0.53
30	98,968	1,937	94,904	1,028	1,099	50.79	1.49	48.00	0.78	0.51
31	98,923	2,093	94,656	1,082	1,092	49.82	1.47	47.07	0.77	0.50
32	98,876	2,230	94,432	1,133	1,081	48.84	1.45	46.13	0.76	0.49
33	98,810	2,338	94,217	1,181	1,074	47.87	1.43	45.21	0.75	0.48
34	98,742	2,433	94,007	1,230	1,071	46.91	1.41	44.29	0.74	0.47
35	98,683	2,520	93,818	1,273	1,072	45.93	1.38	43.36	0.73	0.46
36	98,621	2,593	93,656	1,307	1,064	44.96	1.36	42.44	0.72	0.45
37	98,558	2,658	93,499	1,343	1,059	43.99	1.33	41.52	0.70	0.44
38	98,490	2,704	93,357	1,373	1,056	43.02	1.30	40.60	0.69	0.43
39	98,415	2,735	93,231	1,400	1,049	42.05	1.28	39.68	0.68	0.42

Tab A.2.2 (follows)

Age	Born in Northeast									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
40	98,333	2,768	93,090	1,428	1,047	41.09	1.25	38.76	0.66	0.41
41	98,246	2,802	92,944	1,450	1,050	40.12	1.22	37.85	0.65	0.40
42	98,155	2,833	92,807	1,470	1,045	39.16	1.20	36.94	0.63	0.39
43	98,054	2,856	92,674	1,486	1,037	38.20	1.17	36.03	0.62	0.38
44	97,942	2,865	92,549	1,494	1,034	37.24	1.14	35.13	0.61	0.37
45	97,822	2,871	92,415	1,508	1,028	36.29	1.11	34.23	0.59	0.36
46	97,677	2,879	92,255	1,519	1,023	35.34	1.08	33.33	0.58	0.35
47	97,516	2,892	92,075	1,528	1,022	34.40	1.06	32.44	0.56	0.34
48	97,341	2,905	91,882	1,534	1,019	33.46	1.03	31.56	0.55	0.33
49	97,142	2,914	91,668	1,544	1,015	32.53	1.00	30.68	0.53	0.32
50	96,909	2,920	91,430	1,552	1,008	31.60	0.97	29.80	0.52	0.31
51	96,668	2,922	91,192	1,552	1,002	30.68	0.95	28.93	0.50	0.30
52	96,413	2,927	90,937	1,555	995	29.76	0.92	28.07	0.49	0.29
53	96,125	2,932	90,646	1,558	989	28.85	0.89	27.21	0.47	0.28
54	95,804	2,939	90,325	1,564	976	27.94	0.86	26.35	0.46	0.27
55	95,449	2,940	89,978	1,562	969	27.05	0.84	25.51	0.44	0.26
56	95,050	2,935	89,603	1,558	954	26.16	0.81	24.67	0.43	0.25
57	94,599	2,935	89,166	1,553	945	25.28	0.78	23.84	0.41	0.24
58	94,111	2,935	88,697	1,546	933	24.41	0.75	23.02	0.40	0.24
59	93,590	2,929	88,202	1,541	918	23.54	0.73	22.20	0.39	0.23
60	93,007	2,920	87,634	1,540	912	22.69	0.70	21.40	0.37	0.22
61	92,366	2,908	87,018	1,538	902	21.84	0.67	20.60	0.36	0.21
62	91,650	2,896	86,330	1,533	891	21.01	0.65	19.81	0.34	0.20
63	90,870	2,880	85,587	1,525	879	20.18	0.62	19.04	0.33	0.19
64	90,030	2,866	84,792	1,514	859	19.37	0.59	18.27	0.32	0.19
65	89,091	2,850	83,896	1,499	847	18.56	0.57	17.52	0.30	0.18
66	88,084	2,832	82,936	1,483	834	17.77	0.54	16.77	0.29	0.17
67	86,998	2,810	81,900	1,466	821	16.99	0.52	16.03	0.28	0.16
68	85,788	2,789	80,744	1,446	808	16.22	0.49	15.31	0.26	0.16
69	84,470	2,759	79,493	1,427	792	15.46	0.47	14.60	0.25	0.15
70	83,081	2,723	78,175	1,407	775	14.72	0.44	13.89	0.24	0.14

Source: our elaborations on ISTAT data (estimates).

Tab A.2.3 Multiregional life table for males born in Centre. Survivors and life expectancy by Macroregion of residence. Italy 2011-2013

Age	Born in Centre									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
0	100,000	0	0	100,000	0	80.03	1.70	1.37	75.44	1.52
1	99,731	145	110	99,277	199	79.24	1.70	1.37	74.65	1.52
2	99,705	288	216	98,816	385	78.26	1.70	1.37	73.67	1.52
3	99,687	418	323	98,400	545	77.28	1.69	1.37	72.70	1.51
4	99,676	527	410	98,057	681	76.28	1.69	1.37	71.72	1.51
5	99,666	600	476	97,782	808	75.29	1.68	1.36	70.74	1.50
6	99,657	662	534	97,548	913	74.30	1.68	1.36	69.77	1.49
7	99,648	707	581	97,370	990	73.31	1.67	1.35	68.80	1.48
8	99,637	748	621	97,221	1,047	72.31	1.66	1.34	67.83	1.47
9	99,628	778	650	97,097	1,102	71.32	1.66	1.34	66.86	1.46
10	99,621	804	674	96,989	1,153	70.32	1.65	1.33	65.89	1.45
11	99,614	832	698	96,886	1,199	69.33	1.64	1.33	64.92	1.44
12	99,607	856	716	96,797	1,238	68.33	1.63	1.32	63.96	1.43
13	99,597	876	729	96,722	1,271	67.34	1.62	1.31	62.99	1.42
14	99,584	897	742	96,647	1,298	66.35	1.62	1.30	62.03	1.40
15	99,566	911	756	96,574	1,325	65.36	1.61	1.30	61.07	1.39
16	99,548	917	765	96,521	1,345	64.37	1.60	1.29	60.11	1.38
17	99,524	929	769	96,463	1,363	63.39	1.59	1.28	59.15	1.36
18	99,493	939	772	96,386	1,396	62.41	1.58	1.27	58.20	1.35
19	99,458	957	774	96,275	1,452	61.43	1.57	1.27	57.26	1.34
20	99,417	987	789	96,143	1,498	60.46	1.56	1.26	56.31	1.32
21	99,365	1,026	809	95,996	1,534	59.49	1.55	1.25	55.37	1.31
22	99,315	1,064	834	95,839	1,577	58.52	1.54	1.24	54.44	1.29
23	99,267	1,103	870	95,676	1,618	57.54	1.53	1.24	53.50	1.28
24	99,216	1,170	923	95,458	1,665	56.57	1.52	1.23	52.56	1.26
25	99,162	1,269	997	95,202	1,693	55.60	1.51	1.22	51.63	1.24
26	99,106	1,382	1,100	94,916	1,708	54.64	1.50	1.21	50.70	1.23
27	99,057	1,515	1,222	94,573	1,747	53.66	1.48	1.20	49.77	1.21
28	99,003	1,671	1,352	94,197	1,782	52.69	1.47	1.19	48.84	1.19
29	98,941	1,824	1,486	93,816	1,814	51.72	1.45	1.17	47.92	1.18
30	98,884	1,972	1,601	93,464	1,846	50.75	1.43	1.16	47.00	1.16
31	98,823	2,120	1,703	93,134	1,867	49.78	1.41	1.14	46.09	1.14
32	98,761	2,255	1,788	92,824	1,895	48.82	1.39	1.12	45.18	1.12
33	98,705	2,363	1,860	92,555	1,927	47.84	1.37	1.11	44.26	1.10
34	98,645	2,444	1,935	92,316	1,949	46.87	1.35	1.09	43.35	1.08
35	98,575	2,512	1,987	92,100	1,976	45.90	1.32	1.07	42.45	1.07
36	98,500	2,568	2,022	91,910	2,000	44.94	1.30	1.05	41.55	1.05
37	98,424	2,616	2,061	91,730	2,017	43.97	1.27	1.03	40.64	1.03
38	98,341	2,649	2,089	91,557	2,046	43.01	1.25	1.01	39.75	1.01
39	98,250	2,678	2,117	91,386	2,070	42.05	1.22	0.99	38.85	0.99

Tab A.2.3 (follows)

Age	Born in Centre									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
40	98,156	2,707	2,144	91,221	2,084	41.09	1.19	0.97	37.96	0.97
41	98,056	2,737	2,160	91,066	2,092	40.13	1.17	0.95	37.07	0.95
42	97,949	2,752	2,178	90,917	2,102	39.17	1.14	0.93	36.18	0.93
43	97,829	2,755	2,200	90,760	2,112	38.22	1.11	0.90	35.30	0.91
44	97,701	2,770	2,219	90,588	2,123	37.27	1.09	0.88	34.41	0.89
45	97,557	2,772	2,232	90,424	2,129	36.33	1.06	0.86	33.54	0.86
46	97,399	2,769	2,245	90,256	2,128	35.38	1.03	0.84	32.66	0.84
47	97,229	2,767	2,257	90,075	2,131	34.44	1.01	0.82	31.79	0.82
48	97,045	2,768	2,264	89,886	2,128	33.51	0.98	0.80	30.93	0.80
49	96,843	2,772	2,268	89,681	2,123	32.58	0.95	0.78	30.06	0.78
50	96,606	2,770	2,274	89,440	2,122	31.66	0.93	0.75	29.21	0.76
51	96,339	2,766	2,280	89,166	2,126	30.74	0.90	0.73	28.37	0.74
52	96,043	2,763	2,283	88,869	2,128	29.84	0.88	0.71	27.53	0.72
53	95,723	2,758	2,285	88,560	2,121	28.93	0.85	0.69	26.69	0.70
54	95,380	2,755	2,281	88,226	2,118	28.04	0.82	0.67	25.86	0.68
55	94,990	2,750	2,274	87,854	2,112	27.15	0.80	0.65	25.04	0.66
56	94,560	2,740	2,269	87,443	2,109	26.27	0.77	0.63	24.23	0.65
57	94,108	2,730	2,261	87,013	2,105	25.39	0.75	0.60	23.42	0.63
58	93,608	2,719	2,246	86,555	2,088	24.53	0.72	0.58	22.61	0.61
59	93,061	2,707	2,230	86,048	2,076	23.67	0.70	0.56	21.82	0.59
60	92,466	2,690	2,209	85,491	2,075	22.82	0.67	0.54	21.03	0.57
61	91,808	2,670	2,193	84,887	2,058	21.98	0.65	0.52	20.26	0.55
62	91,088	2,651	2,183	84,220	2,035	21.15	0.62	0.50	19.49	0.53
63	90,313	2,634	2,167	83,495	2,017	20.32	0.60	0.48	18.73	0.51
64	89,470	2,612	2,152	82,708	1,999	19.51	0.58	0.46	17.97	0.50
65	88,552	2,589	2,137	81,846	1,979	18.71	0.55	0.44	17.23	0.48
66	87,548	2,561	2,121	80,911	1,955	17.92	0.53	0.42	16.50	0.46
67	86,452	2,532	2,097	79,902	1,922	17.14	0.51	0.41	15.78	0.45
68	85,271	2,508	2,067	78,801	1,896	16.37	0.49	0.39	15.07	0.43
69	84,010	2,475	2,042	77,620	1,873	15.61	0.46	0.37	14.36	0.41
70	82,631	2,447	2,012	76,336	1,836	14.86	0.44	0.35	13.67	0.40

Source: our elaborations on ISTAT data (estimates).

Tab A.2.4 Multiregional life table for males born in South. Survivors and life expectancy by Macroregion of residence. Italy 2011-2013

Age	Born in South									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
0	100,000	0	0	0	100,000	79.66	4.63	3.18	3.66	68.19
1	99,632	196	155	189	99,091	78.95	4.65	3.19	3.67	67.45
2	99,602	388	306	359	98,548	77.98	4.65	3.18	3.67	66.47
3	99,588	550	425	505	98,107	76.99	4.64	3.18	3.67	65.50
4	99,578	667	522	628	97,760	76.00	4.64	3.18	3.66	64.52
5	99,570	753	606	728	97,483	75.00	4.63	3.17	3.66	63.54
6	99,563	827	684	813	97,239	74.01	4.62	3.17	3.65	62.57
7	99,554	894	750	887	97,024	73.01	4.62	3.16	3.64	61.60
8	99,545	951	803	949	96,842	72.02	4.61	3.15	3.63	60.63
9	99,536	1,013	848	1,010	96,665	71.03	4.60	3.14	3.62	59.66
10	99,527	1,072	885	1,068	96,502	70.03	4.59	3.13	3.61	58.70
11	99,519	1,116	919	1,117	96,366	69.04	4.58	3.13	3.60	57.74
12	99,508	1,157	953	1,164	96,235	68.05	4.57	3.12	3.59	56.77
13	99,499	1,191	986	1,209	96,112	67.05	4.55	3.11	3.58	55.81
14	99,488	1,221	1,023	1,255	95,988	66.06	4.54	3.10	3.57	54.85
15	99,472	1,251	1,060	1,293	95,868	65.07	4.53	3.09	3.56	53.90
16	99,450	1,278	1,082	1,319	95,771	64.09	4.52	3.08	3.54	52.95
17	99,421	1,303	1,105	1,343	95,671	63.10	4.51	3.07	3.53	52.00
18	99,388	1,332	1,132	1,370	95,553	62.12	4.50	3.06	3.52	51.05
19	99,346	1,386	1,171	1,417	95,373	61.15	4.48	3.05	3.51	50.12
20	99,299	1,489	1,242	1,504	95,063	60.18	4.47	3.04	3.49	49.18
21	99,254	1,646	1,356	1,620	94,631	59.21	4.46	3.02	3.48	48.25
22	99,209	1,851	1,525	1,761	94,072	58.23	4.44	3.01	3.46	47.32
23	99,168	2,114	1,752	1,919	93,383	57.26	4.42	3.00	3.45	46.39
24	99,121	2,454	2,019	2,086	92,562	56.28	4.40	2.98	3.43	45.48
25	99,070	2,868	2,322	2,293	91,587	55.31	4.38	2.96	3.41	44.57
26	99,017	3,341	2,655	2,525	90,497	54.34	4.35	2.93	3.38	43.67
27	98,967	3,884	3,029	2,781	89,273	53.37	4.32	2.91	3.36	42.79
28	98,916	4,482	3,440	3,092	87,902	52.40	4.28	2.88	3.33	41.91
29	98,862	5,082	3,844	3,448	86,489	51.42	4.23	2.84	3.30	41.06
30	98,809	5,639	4,200	3,816	85,154	50.45	4.18	2.80	3.26	40.21
31	98,754	6,127	4,506	4,181	83,939	49.48	4.12	2.76	3.23	39.38
32	98,694	6,528	4,768	4,534	82,863	48.51	4.06	2.71	3.18	38.55
33	98,630	6,845	4,978	4,845	81,962	47.54	3.99	2.67	3.14	37.74
34	98,568	7,083	5,144	5,106	81,236	46.57	3.92	2.62	3.09	36.94
35	98,503	7,259	5,275	5,336	80,633	45.60	3.85	2.56	3.04	36.14
36	98,434	7,397	5,376	5,530	80,131	44.63	3.78	2.51	2.99	35.35
37	98,359	7,522	5,456	5,680	79,701	43.67	3.71	2.46	2.93	34.57
38	98,275	7,630	5,511	5,811	79,324	42.70	3.64	2.41	2.88	33.79
39	98,187	7,708	5,551	5,927	79,001	41.74	3.56	2.35	2.82	33.01

Tab A.2.4 (follows)

Age	Born in South									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
40	98,092	7,770	5,594	6,024	78,704	40.78	3.49	2.30	2.76	32.24
41	97,988	7,815	5,626	6,105	78,442	39.82	3.41	2.24	2.70	31.47
42	97,873	7,858	5,640	6,174	78,201	38.87	3.33	2.19	2.64	30.71
43	97,744	7,890	5,655	6,223	77,976	37.92	3.26	2.13	2.58	29.95
44	97,598	7,911	5,660	6,258	77,770	36.98	3.18	2.08	2.52	29.20
45	97,443	7,933	5,658	6,287	77,565	36.03	3.11	2.02	2.46	28.44
46	97,273	7,952	5,649	6,308	77,364	35.10	3.03	1.97	2.40	27.70
47	97,074	7,964	5,634	6,327	77,150	34.17	2.95	1.91	2.34	26.96
48	96,858	7,972	5,616	6,344	76,925	33.24	2.88	1.86	2.28	26.22
49	96,625	7,981	5,587	6,354	76,703	32.32	2.80	1.81	2.22	25.49
50	96,367	7,983	5,560	6,358	76,466	31.41	2.73	1.75	2.16	24.77
51	96,075	7,982	5,536	6,360	76,197	30.50	2.65	1.70	2.10	24.05
52	95,760	7,978	5,506	6,360	75,916	29.60	2.58	1.65	2.04	23.33
53	95,422	7,972	5,472	6,356	75,622	28.70	2.50	1.60	1.98	22.62
54	95,043	7,962	5,435	6,346	75,299	27.81	2.43	1.55	1.92	21.92
55	94,631	7,953	5,399	6,336	74,944	26.93	2.36	1.50	1.86	21.22
56	94,189	7,939	5,360	6,324	74,566	26.06	2.28	1.45	1.81	20.52
57	93,702	7,919	5,318	6,301	74,165	25.19	2.21	1.40	1.75	19.84
58	93,161	7,894	5,281	6,271	73,715	24.33	2.14	1.35	1.69	19.16
59	92,565	7,864	5,236	6,246	73,219	23.49	2.07	1.30	1.63	18.49
60	91,912	7,829	5,181	6,217	72,685	22.65	2.00	1.25	1.58	17.83
61	91,205	7,785	5,120	6,177	72,124	21.82	1.93	1.21	1.52	17.17
62	90,444	7,731	5,068	6,127	71,519	21.00	1.86	1.16	1.47	16.52
63	89,602	7,671	5,008	6,079	70,844	20.19	1.79	1.11	1.41	15.88
64	88,675	7,609	4,940	6,028	70,097	19.40	1.72	1.07	1.36	15.25
65	87,684	7,543	4,867	5,975	69,298	18.61	1.65	1.03	1.31	14.63
66	86,607	7,466	4,787	5,923	68,431	17.84	1.59	0.98	1.25	14.02
67	85,406	7,382	4,705	5,864	67,455	17.08	1.52	0.94	1.20	13.42
68	84,098	7,287	4,623	5,792	66,395	16.34	1.46	0.90	1.15	12.83
69	82,684	7,182	4,532	5,715	65,256	15.61	1.40	0.86	1.10	12.25
70	81,146	7,070	4,442	5,619	64,014	14.90	1.33	0.82	1.05	11.69

Source: our elaborations on ISTAT data (estimates).

Tab A.2.5 Multiregional life table for females born in Northwest. Survivors and life expectancy by Macroregion of residence. Italy 2011-2013

Age	Born in Northwest									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
0	100,000	100,000	0	0	0	84.59	79.94	1.91	1.36	1.38
1	99,785	99,437	115	78	155	83.77	79.12	1.91	1.36	1.38
2	99,762	99,059	231	162	310	82.79	78.14	1.91	1.36	1.38
3	99,747	98,715	337	238	456	81.80	77.16	1.91	1.36	1.38
4	99,734	98,423	427	306	577	80.81	76.18	1.90	1.36	1.37
5	99,723	98,186	501	365	672	79.82	75.20	1.90	1.35	1.36
6	99,717	97,982	570	410	755	78.83	74.23	1.89	1.35	1.36
7	99,711	97,806	627	449	829	77.83	73.25	1.89	1.34	1.35
8	99,704	97,662	671	481	890	76.84	72.27	1.88	1.34	1.34
9	99,695	97,539	706	512	938	75.84	71.30	1.88	1.33	1.33
10	99,686	97,420	744	535	987	74.85	70.33	1.87	1.33	1.32
11	99,679	97,309	778	559	1,032	73.86	69.36	1.86	1.32	1.31
12	99,674	97,206	809	581	1,078	72.86	68.38	1.85	1.32	1.30
13	99,668	97,118	834	596	1,119	71.86	67.41	1.84	1.31	1.29
14	99,657	97,030	858	608	1,161	70.87	66.45	1.84	1.31	1.28
15	99,645	96,943	886	621	1,196	69.88	65.48	1.83	1.30	1.27
16	99,633	96,866	906	632	1,229	68.89	64.52	1.82	1.29	1.26
17	99,620	96,800	919	648	1,254	67.90	63.55	1.81	1.29	1.24
18	99,606	96,716	934	667	1,290	66.91	62.59	1.80	1.28	1.23
19	99,594	96,598	960	689	1,347	65.91	61.63	1.79	1.28	1.22
20	99,580	96,454	999	717	1,410	64.92	60.67	1.78	1.27	1.20
21	99,564	96,294	1,050	748	1,472	63.93	59.71	1.77	1.26	1.19
22	99,548	96,139	1,106	782	1,521	62.94	58.75	1.76	1.25	1.18
23	99,532	95,983	1,166	823	1,560	61.95	57.80	1.75	1.25	1.16
24	99,517	95,803	1,232	879	1,604	60.96	56.84	1.74	1.24	1.14
25	99,500	95,596	1,317	944	1,642	59.97	55.89	1.73	1.23	1.13
26	99,483	95,355	1,441	1,014	1,674	58.98	54.94	1.71	1.22	1.11
27	99,467	95,072	1,582	1,095	1,718	57.99	53.99	1.70	1.21	1.10
28	99,449	94,786	1,716	1,186	1,761	57.00	53.05	1.68	1.20	1.08
29	99,432	94,514	1,847	1,283	1,787	56.01	52.10	1.66	1.19	1.06
30	99,414	94,243	1,971	1,389	1,811	55.02	51.16	1.65	1.17	1.04
31	99,391	93,969	2,087	1,493	1,841	54.04	50.23	1.63	1.16	1.02
32	99,367	93,708	2,203	1,585	1,871	53.05	49.30	1.60	1.14	1.01
33	99,343	93,481	2,298	1,659	1,905	52.06	48.37	1.58	1.13	0.99
34	99,313	93,288	2,369	1,721	1,936	51.08	47.44	1.56	1.11	0.97
35	99,278	93,090	2,436	1,787	1,965	50.09	46.52	1.54	1.09	0.95
36	99,239	92,890	2,513	1,840	1,996	49.11	45.60	1.51	1.07	0.93
37	99,206	92,725	2,581	1,882	2,018	48.13	44.68	1.49	1.06	0.91
38	99,168	92,578	2,627	1,920	2,042	47.15	43.76	1.46	1.04	0.89
39	99,122	92,430	2,663	1,958	2,071	46.17	42.85	1.43	1.02	0.87

Tab A.2.5 (follows)

Age	Born in Northwest									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
40	99,072	92,290	2,701	1,991	2,091	45.19	41.94	1.41	1.00	0.85
41	99,020	92,164	2,738	2,017	2,101	44.22	41.03	1.38	0.98	0.83
42	98,960	92,033	2,767	2,042	2,116	43.24	40.12	1.35	0.96	0.81
43	98,889	91,906	2,792	2,061	2,131	42.27	39.22	1.33	0.94	0.79
44	98,813	91,785	2,814	2,073	2,141	41.31	38.32	1.30	0.92	0.76
45	98,726	91,659	2,834	2,085	2,148	40.34	37.43	1.27	0.90	0.74
46	98,622	91,521	2,853	2,093	2,156	39.38	36.54	1.24	0.88	0.72
47	98,512	91,381	2,867	2,103	2,161	38.43	35.65	1.22	0.86	0.70
48	98,387	91,240	2,875	2,114	2,158	37.48	34.77	1.19	0.84	0.68
49	98,249	91,088	2,884	2,121	2,157	36.53	33.89	1.16	0.82	0.66
50	98,100	90,925	2,894	2,128	2,153	35.58	33.01	1.13	0.80	0.64
51	97,946	90,759	2,903	2,134	2,149	34.64	32.14	1.11	0.78	0.62
52	97,773	90,576	2,911	2,140	2,146	33.70	31.27	1.08	0.76	0.60
53	97,571	90,370	2,914	2,145	2,142	32.77	30.40	1.05	0.74	0.58
54	97,356	90,157	2,921	2,144	2,133	31.84	29.54	1.02	0.72	0.56
55	97,109	89,922	2,924	2,141	2,121	30.92	28.69	1.00	0.70	0.53
56	96,860	89,682	2,929	2,137	2,111	30.00	27.84	0.97	0.67	0.51
57	96,599	89,428	2,936	2,138	2,097	29.08	26.99	0.94	0.65	0.49
58	96,287	89,132	2,936	2,140	2,079	28.17	26.15	0.91	0.63	0.47
59	95,947	88,817	2,933	2,141	2,056	27.27	25.31	0.89	0.61	0.45
60	95,607	88,498	2,935	2,142	2,033	26.36	24.48	0.86	0.59	0.43
61	95,245	88,157	2,937	2,139	2,011	25.46	23.64	0.83	0.57	0.41
62	94,832	87,786	2,935	2,133	1,978	24.57	22.82	0.80	0.55	0.40
63	94,377	87,372	2,934	2,133	1,938	23.68	22.00	0.78	0.53	0.38
64	93,895	86,928	2,927	2,125	1,915	22.80	21.18	0.75	0.51	0.36
65	93,368	86,453	2,917	2,107	1,891	21.93	20.37	0.72	0.49	0.34
66	92,790	85,930	2,903	2,091	1,867	21.06	19.57	0.69	0.47	0.32
67	92,185	85,374	2,888	2,077	1,845	20.20	18.77	0.67	0.46	0.30
68	91,535	84,783	2,876	2,060	1,816	19.34	17.98	0.64	0.44	0.29
69	90,819	84,138	2,865	2,039	1,776	18.49	17.19	0.61	0.42	0.27
70	90,035	83,423	2,848	2,027	1,737	17.64	16.41	0.59	0.40	0.25

Source: our elaborations on ISTAT data (estimates).

Tab A.2.6 Multiregional life table for females born in Northeast. Survivors and life expectancy by Macroregion of residence. Italy 2011-2013

Age	Born in Northeast									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
0	100,000	0	100,000	0	0	84.83	2.12	80.42	1.27	1.02
1	99,771	170	99,338	99	164	84.03	2.12	79.61	1.27	1.02
2	99,742	327	98,878	203	334	83.05	2.12	78.63	1.27	1.02
3	99,728	462	98,481	305	481	82.06	2.12	77.66	1.27	1.02
4	99,720	572	98,168	383	597	81.07	2.11	76.68	1.27	1.01
5	99,712	645	97,921	446	700	80.07	2.11	75.70	1.26	1.01
6	99,706	709	97,689	505	802	79.08	2.10	74.72	1.26	1.00
7	99,700	762	97,498	552	888	78.08	2.09	73.75	1.25	0.99
8	99,694	801	97,358	587	947	77.09	2.08	72.78	1.25	0.98
9	99,689	831	97,242	619	997	76.09	2.08	71.80	1.24	0.97
10	99,685	865	97,132	648	1,039	75.10	2.07	70.83	1.23	0.96
11	99,678	898	97,032	669	1,078	74.10	2.06	69.86	1.23	0.95
12	99,671	927	96,938	687	1,120	73.10	2.05	68.89	1.22	0.94
13	99,667	951	96,867	706	1,143	72.11	2.04	67.92	1.21	0.93
14	99,658	970	96,803	723	1,162	71.11	2.03	66.96	1.21	0.92
15	99,651	981	96,748	741	1,182	70.12	2.02	65.99	1.20	0.91
16	99,643	990	96,710	746	1,197	69.12	2.01	65.03	1.19	0.89
17	99,634	996	96,679	754	1,205	68.13	2.00	64.06	1.18	0.88
18	99,619	1,003	96,622	772	1,221	67.14	1.99	63.10	1.18	0.87
19	99,605	1,028	96,528	803	1,246	66.15	1.98	62.14	1.17	0.86
20	99,592	1,072	96,422	831	1,267	65.16	1.97	61.18	1.16	0.85
21	99,576	1,138	96,302	854	1,281	64.17	1.96	60.22	1.15	0.83
22	99,555	1,216	96,159	880	1,300	63.18	1.95	59.27	1.14	0.82
23	99,535	1,306	96,014	905	1,310	62.20	1.94	58.32	1.14	0.81
24	99,514	1,393	95,874	941	1,306	61.21	1.92	57.36	1.13	0.79
25	99,490	1,504	95,682	991	1,313	60.22	1.91	56.41	1.12	0.78
26	99,472	1,667	95,435	1,054	1,315	59.23	1.90	55.46	1.11	0.77
27	99,456	1,841	95,165	1,130	1,320	58.24	1.88	54.52	1.10	0.75
28	99,439	2,022	94,875	1,205	1,338	57.25	1.86	53.57	1.08	0.74
29	99,421	2,211	94,569	1,286	1,354	56.26	1.84	52.63	1.07	0.73
30	99,402	2,389	94,279	1,378	1,356	55.27	1.81	51.69	1.06	0.71
31	99,376	2,557	93,992	1,465	1,362	54.29	1.79	50.75	1.04	0.70
32	99,352	2,704	93,735	1,545	1,369	53.30	1.76	49.82	1.03	0.69
33	99,326	2,819	93,520	1,612	1,374	52.32	1.74	48.89	1.01	0.67
34	99,301	2,912	93,335	1,672	1,381	51.33	1.71	47.96	1.00	0.66
35	99,271	2,997	93,169	1,732	1,372	50.34	1.68	47.04	0.98	0.65
36	99,232	3,073	93,015	1,781	1,363	49.36	1.65	46.12	0.96	0.63
37	99,197	3,125	92,888	1,826	1,358	48.38	1.62	45.20	0.95	0.62
38	99,159	3,174	92,764	1,863	1,357	47.40	1.59	44.28	0.93	0.61
39	99,113	3,216	92,653	1,891	1,352	46.42	1.56	43.36	0.91	0.59

Tab A.2.6 (follows)

Age	Born in Northeast									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
40	99,064	3,235	92,571	1,909	1,349	45.44	1.52	42.45	0.89	0.58
41	99,009	3,251	92,489	1,921	1,347	44.47	1.49	41.54	0.87	0.57
42	98,946	3,261	92,403	1,933	1,348	43.50	1.46	40.63	0.85	0.55
43	98,881	3,270	92,320	1,943	1,347	42.53	1.43	39.72	0.83	0.54
44	98,816	3,291	92,238	1,946	1,340	41.55	1.40	38.82	0.81	0.53
45	98,741	3,299	92,159	1,954	1,328	40.58	1.36	37.91	0.80	0.51
46	98,651	3,300	92,067	1,964	1,321	39.62	1.33	37.01	0.78	0.50
47	98,546	3,300	91,958	1,968	1,320	38.66	1.30	36.12	0.76	0.49
48	98,429	3,296	91,843	1,971	1,318	37.71	1.27	35.23	0.74	0.47
49	98,304	3,294	91,720	1,973	1,316	36.75	1.24	34.34	0.72	0.46
50	98,163	3,295	91,581	1,972	1,315	35.81	1.20	33.45	0.70	0.45
51	98,001	3,299	91,416	1,977	1,310	34.87	1.17	32.58	0.68	0.44
52	97,826	3,295	91,256	1,975	1,300	33.93	1.14	31.70	0.66	0.42
53	97,641	3,289	91,095	1,968	1,289	32.99	1.11	30.83	0.64	0.41
54	97,433	3,285	90,903	1,966	1,279	32.06	1.08	29.96	0.62	0.40
55	97,213	3,285	90,689	1,971	1,269	31.13	1.05	29.09	0.61	0.39
56	96,983	3,284	90,467	1,971	1,260	30.20	1.02	28.23	0.59	0.37
57	96,722	3,281	90,225	1,967	1,249	29.28	0.98	27.37	0.57	0.36
58	96,443	3,275	89,970	1,957	1,240	28.37	0.95	26.51	0.55	0.35
59	96,148	3,273	89,693	1,951	1,230	27.45	0.92	25.66	0.53	0.34
60	95,815	3,271	89,373	1,946	1,225	26.55	0.89	24.82	0.51	0.33
61	95,446	3,265	89,023	1,939	1,219	25.65	0.86	23.98	0.49	0.32
62	95,056	3,264	88,651	1,933	1,208	24.75	0.83	23.14	0.48	0.30
63	94,632	3,264	88,250	1,928	1,190	23.86	0.80	22.31	0.46	0.29
64	94,174	3,260	87,823	1,920	1,172	22.97	0.77	21.48	0.44	0.28
65	93,669	3,253	87,345	1,914	1,157	22.09	0.74	20.66	0.42	0.27
66	93,105	3,247	86,810	1,907	1,141	21.22	0.71	19.85	0.40	0.26
67	92,496	3,238	86,233	1,895	1,130	20.36	0.68	19.05	0.38	0.25
68	91,863	3,227	85,637	1,879	1,120	19.50	0.65	18.25	0.37	0.24
69	91,177	3,214	84,993	1,865	1,105	18.64	0.62	17.45	0.35	0.23
70	90,410	3,198	84,271	1,853	1,088	17.79	0.58	16.66	0.33	0.22

Source: our elaborations on ISTAT data (estimates).

Tab A.2.7 Multiregional life table for females born in Centre. Survivors and life expectancy by Macroregion of residence. Italy 2011-2013

Age	Born in Centre									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
0	100,000	0	0	100,000	0	84.76	1.78	1.54	79.70	1.74
1	99,782	136	111	99,343	192	83.94	1.78	1.54	78.88	1.74
2	99,763	279	227	98,868	390	82.96	1.78	1.54	77.90	1.74
3	99,752	406	323	98,463	560	81.97	1.77	1.54	76.92	1.74
4	99,742	499	397	98,149	697	80.98	1.77	1.53	75.94	1.73
5	99,733	567	459	97,897	811	79.98	1.76	1.53	74.97	1.72
6	99,726	629	522	97,663	912	78.99	1.76	1.53	73.99	1.72
7	99,719	684	573	97,466	995	78.00	1.75	1.52	73.02	1.71
8	99,714	722	606	97,322	1,064	77.00	1.74	1.51	72.05	1.70
9	99,709	754	646	97,188	1,121	76.00	1.74	1.51	71.07	1.68
10	99,703	788	680	97,067	1,169	75.01	1.73	1.50	70.10	1.67
11	99,697	817	705	96,965	1,210	74.01	1.72	1.49	69.14	1.66
12	99,691	840	729	96,871	1,252	73.02	1.71	1.49	68.17	1.65
13	99,685	861	743	96,795	1,286	72.02	1.70	1.48	67.20	1.64
14	99,675	874	755	96,734	1,312	71.03	1.70	1.47	66.24	1.62
15	99,665	878	766	96,684	1,338	70.04	1.69	1.46	65.27	1.61
16	99,654	885	776	96,629	1,364	69.04	1.68	1.46	64.31	1.60
17	99,642	898	784	96,573	1,387	68.05	1.67	1.45	63.35	1.58
18	99,630	906	792	96,515	1,417	67.06	1.66	1.44	62.39	1.57
19	99,619	921	804	96,427	1,467	66.07	1.65	1.43	61.42	1.56
20	99,604	945	821	96,295	1,543	65.08	1.64	1.43	60.47	1.54
21	99,588	978	854	96,147	1,608	64.09	1.63	1.42	59.51	1.53
22	99,573	1,018	895	96,002	1,658	63.10	1.62	1.41	58.55	1.51
23	99,556	1,075	940	95,833	1,709	62.11	1.61	1.40	57.60	1.49
24	99,539	1,160	1,029	95,585	1,765	61.12	1.60	1.39	56.65	1.48
25	99,522	1,263	1,136	95,288	1,835	60.13	1.59	1.38	55.70	1.46
26	99,502	1,397	1,241	94,961	1,904	59.14	1.58	1.37	54.76	1.44
27	99,481	1,545	1,368	94,587	1,980	58.15	1.56	1.36	53.81	1.42
28	99,457	1,705	1,515	94,197	2,041	57.17	1.55	1.34	52.88	1.40
29	99,439	1,857	1,659	93,845	2,078	56.18	1.53	1.33	51.94	1.38
30	99,421	2,003	1,787	93,511	2,120	55.19	1.51	1.31	51.01	1.36
31	99,397	2,140	1,907	93,183	2,167	54.20	1.49	1.29	50.08	1.34
32	99,370	2,268	2,011	92,887	2,204	53.21	1.47	1.27	49.16	1.32
33	99,343	2,387	2,084	92,642	2,231	52.23	1.45	1.25	48.24	1.29
34	99,319	2,478	2,152	92,433	2,257	51.24	1.42	1.23	47.32	1.27
35	99,292	2,549	2,213	92,250	2,279	50.26	1.40	1.21	46.40	1.25
36	99,261	2,607	2,259	92,093	2,302	49.27	1.37	1.19	45.49	1.23
37	99,226	2,661	2,295	91,946	2,325	48.29	1.34	1.16	44.58	1.20
38	99,185	2,716	2,320	91,814	2,335	47.31	1.32	1.14	43.67	1.18
39	99,141	2,755	2,337	91,706	2,344	46.33	1.29	1.12	42.76	1.16

Tab A.2.7 (follows)

Age	Born in Centre									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
40	99,089	2,776	2,355	91,600	2,359	45.35	1.26	1.09	41.86	1.13
41	99,030	2,791	2,366	91,505	2,368	44.38	1.24	1.07	40.96	1.11
42	98,969	2,804	2,389	91,403	2,372	43.41	1.21	1.05	40.06	1.09
43	98,898	2,815	2,407	91,298	2,378	42.44	1.18	1.02	39.17	1.06
44	98,817	2,818	2,413	91,205	2,381	41.47	1.15	1.00	38.28	1.04
45	98,724	2,810	2,416	91,113	2,385	40.51	1.13	0.98	37.39	1.02
46	98,622	2,801	2,420	91,019	2,383	39.55	1.10	0.95	36.50	0.99
47	98,514	2,793	2,426	90,920	2,375	38.59	1.07	0.93	35.62	0.97
48	98,398	2,789	2,426	90,820	2,363	37.64	1.04	0.91	34.74	0.95
49	98,273	2,785	2,419	90,712	2,357	36.69	1.02	0.88	33.86	0.93
50	98,132	2,784	2,416	90,580	2,352	35.74	0.99	0.86	32.98	0.90
51	97,975	2,781	2,419	90,432	2,343	34.79	0.96	0.84	32.11	0.88
52	97,794	2,776	2,419	90,255	2,345	33.86	0.94	0.81	31.25	0.86
53	97,587	2,770	2,409	90,067	2,342	32.93	0.91	0.79	30.39	0.84
54	97,366	2,763	2,401	89,869	2,334	32.00	0.88	0.77	29.54	0.81
55	97,137	2,758	2,396	89,658	2,325	31.08	0.86	0.74	28.68	0.79
56	96,883	2,753	2,391	89,420	2,318	30.16	0.83	0.72	27.83	0.77
57	96,591	2,746	2,381	89,160	2,305	29.25	0.81	0.70	26.99	0.75
58	96,290	2,734	2,369	88,893	2,293	28.34	0.78	0.68	26.15	0.73
59	95,979	2,719	2,362	88,619	2,279	27.43	0.75	0.65	25.31	0.71
60	95,633	2,705	2,358	88,311	2,258	26.52	0.73	0.63	24.48	0.68
61	95,250	2,692	2,352	87,965	2,241	25.63	0.70	0.61	23.65	0.66
62	94,850	2,679	2,339	87,605	2,228	24.74	0.68	0.59	22.83	0.64
63	94,412	2,671	2,329	87,203	2,209	23.85	0.65	0.57	22.01	0.62
64	93,930	2,661	2,318	86,761	2,189	22.97	0.63	0.54	21.19	0.60
65	93,407	2,645	2,314	86,281	2,167	22.09	0.60	0.52	20.39	0.58
66	92,819	2,619	2,307	85,745	2,149	21.23	0.58	0.50	19.59	0.56
67	92,182	2,599	2,295	85,158	2,130	20.37	0.55	0.48	18.80	0.54
68	91,507	2,582	2,282	84,531	2,111	19.52	0.53	0.46	18.01	0.52
69	90,789	2,568	2,266	83,863	2,091	18.67	0.51	0.44	17.22	0.51
70	90,016	2,553	2,254	83,140	2,069	17.83	0.48	0.42	16.44	0.49

Source: our elaborations on ISTAT data (estimates).

Tab A.2.8 Multiregional life table for females born in South. Survivors and life expectancy by Macroregion of residence. Italy 2011-2013

Age	Born in South									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
0	100,000	0	0	0	100,000	84.75	4.49	3.13	4.15	72.98
1	99,690	187	172	194	99,137	84.01	4.50	3.13	4.16	72.21
2	99,665	359	329	381	98,595	83.03	4.50	3.13	4.16	71.23
3	99,651	510	459	539	98,143	82.04	4.50	3.13	4.16	70.26
4	99,640	634	559	663	97,784	81.05	4.49	3.12	4.15	69.28
5	99,632	727	633	762	97,509	80.06	4.49	3.12	4.15	68.31
6	99,625	807	709	852	97,257	79.06	4.48	3.11	4.14	67.33
7	99,618	872	776	930	97,040	78.07	4.47	3.10	4.13	66.36
8	99,611	935	819	997	96,860	77.07	4.46	3.10	4.12	65.39
9	99,605	986	863	1,058	96,698	76.08	4.45	3.09	4.11	64.43
10	99,599	1,030	906	1,112	96,551	75.08	4.44	3.08	4.10	63.46
11	99,594	1,079	946	1,163	96,406	74.09	4.43	3.07	4.09	62.49
12	99,588	1,120	980	1,209	96,279	73.09	4.42	3.06	4.08	61.53
13	99,581	1,156	1,005	1,248	96,171	72.10	4.41	3.05	4.06	60.57
14	99,572	1,189	1,030	1,285	96,067	71.10	4.40	3.04	4.05	59.61
15	99,562	1,220	1,051	1,316	95,975	70.11	4.39	3.03	4.04	58.65
16	99,549	1,248	1,069	1,339	95,893	69.12	4.38	3.02	4.03	57.69
17	99,536	1,267	1,088	1,361	95,819	68.13	4.37	3.01	4.01	56.74
18	99,526	1,284	1,105	1,386	95,751	67.13	4.35	3.00	4.00	55.78
19	99,514	1,328	1,139	1,435	95,612	66.14	4.34	2.99	3.99	54.83
20	99,499	1,421	1,202	1,513	95,363	65.15	4.33	2.98	3.97	53.88
21	99,486	1,548	1,283	1,607	95,048	64.16	4.31	2.97	3.96	52.93
22	99,470	1,703	1,387	1,716	94,664	63.17	4.30	2.95	3.94	51.98
23	99,452	1,894	1,535	1,844	94,180	62.18	4.28	2.94	3.92	51.04
24	99,435	2,127	1,741	2,003	93,564	61.19	4.26	2.92	3.90	50.11
25	99,417	2,425	1,998	2,212	92,782	60.20	4.24	2.90	3.88	49.18
26	99,400	2,795	2,306	2,473	91,826	59.21	4.21	2.88	3.86	48.26
27	99,383	3,224	2,646	2,776	90,738	58.22	4.18	2.86	3.84	47.35
28	99,366	3,695	2,985	3,125	89,560	57.23	4.15	2.83	3.81	46.45
29	99,346	4,161	3,320	3,529	88,336	56.25	4.11	2.80	3.77	45.56
30	99,322	4,586	3,623	3,955	87,159	55.26	4.07	2.77	3.74	44.69
31	99,296	4,971	3,880	4,349	86,096	54.27	4.02	2.73	3.70	43.83
32	99,270	5,324	4,095	4,715	85,136	53.29	3.97	2.69	3.65	42.98
33	99,243	5,627	4,295	5,056	84,266	52.30	3.92	2.65	3.60	42.14
34	99,214	5,868	4,472	5,356	83,519	51.32	3.86	2.60	3.55	41.30
35	99,182	6,072	4,607	5,610	82,894	50.33	3.80	2.56	3.50	40.48
36	99,146	6,238	4,709	5,821	82,378	49.35	3.74	2.51	3.44	39.66
37	99,107	6,373	4,797	6,003	81,934	48.37	3.68	2.47	3.38	38.85
38	99,064	6,488	4,868	6,165	81,542	47.39	3.61	2.42	3.32	38.04
39	99,015	6,586	4,919	6,290	81,220	46.42	3.55	2.37	3.26	37.23

Tab A.2.8 (follows)[14]

Age	Born in South									
	Survivors (l_x)					Life expectancy (e_x)				
	Total	Northwest	Northeast	Centre	South	Total	Northwest	Northeast	Centre	South
40	98,958	6,656	4,961	6,379	80,962	45.44	3.48	2.32	3.20	36.44
41	98,897	6,702	4,991	6,446	80,758	44.47	3.42	2.27	3.14	35.64
42	98,829	6,740	5,013	6,502	80,574	43.50	3.35	2.22	3.07	34.85
43	98,751	6,777	5,027	6,553	80,395	42.53	3.29	2.17	3.01	34.06
44	98,665	6,810	5,031	6,589	80,235	41.57	3.22	2.13	2.95	33.28
45	98,566	6,838	5,035	6,613	80,080	40.61	3.16	2.08	2.88	32.50
46	98,456	6,862	5,033	6,630	79,931	39.66	3.09	2.03	2.82	31.72
47	98,342	6,884	5,024	6,639	79,795	38.70	3.02	1.98	2.75	30.95
48	98,221	6,905	5,018	6,648	79,651	37.75	2.96	1.93	2.69	30.17
49	98,076	6,925	5,007	6,655	79,488	36.80	2.89	1.88	2.63	29.41
50	97,911	6,938	4,996	6,659	79,319	35.86	2.82	1.83	2.56	28.64
51	97,733	6,949	4,980	6,657	79,146	34.93	2.76	1.79	2.50	27.89
52	97,546	6,958	4,957	6,653	78,978	34.00	2.69	1.74	2.43	27.13
53	97,343	6,969	4,930	6,650	78,795	33.07	2.63	1.69	2.37	26.37
54	97,121	6,978	4,905	6,646	78,593	32.14	2.56	1.65	2.31	25.62
55	96,882	6,983	4,881	6,640	78,378	31.22	2.50	1.60	2.25	24.88
56	96,624	6,987	4,856	6,630	78,150	30.30	2.43	1.55	2.18	24.13
57	96,345	6,986	4,833	6,619	77,906	29.39	2.36	1.51	2.12	23.39
58	96,038	6,986	4,812	6,607	77,634	28.48	2.30	1.46	2.06	22.66
59	95,705	6,986	4,787	6,590	77,342	27.58	2.23	1.42	2.00	21.93
60	95,349	6,986	4,765	6,571	77,027	26.68	2.17	1.37	1.94	21.20
61	94,964	6,983	4,742	6,553	76,686	25.78	2.10	1.33	1.87	20.48
62	94,535	6,981	4,714	6,539	76,300	24.90	2.04	1.28	1.81	19.76
63	94,065	6,975	4,688	6,525	75,877	24.02	1.98	1.24	1.75	19.05
64	93,566	6,959	4,657	6,512	75,439	23.14	1.91	1.20	1.69	18.34
65	93,017	6,947	4,622	6,495	74,953	22.28	1.85	1.15	1.63	17.64
66	92,412	6,938	4,587	6,472	74,416	21.42	1.79	1.11	1.57	16.95
67	91,753	6,926	4,550	6,447	73,831	20.57	1.72	1.07	1.51	16.27
68	91,021	6,909	4,514	6,416	73,182	19.73	1.66	1.03	1.46	15.59
69	90,231	6,888	4,470	6,383	72,490	18.90	1.60	0.99	1.40	14.92
70	89,380	6,865	4,425	6,348	71,743	18.08	1.54	0.95	1.34	14.25

Source: our elaborations on ISTAT data (estimates).

[14] Multiregional life tables (dependent approach) relating to other time intervals (2002-2004; 2005-2007 and 2008-2010) are available on request.

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CHAPTER 3

INTERREGIONAL MIGRATION IN ITALY IN 2014:
THE ROLE OF THE PLACE OF BIRTH

3.1 Introduction

The interest in internal migration in Italy has grown in recent years (Pugliese 2011). This is a consequence of the growth in migration flows after a period of stagnation (Casacchia *et al.* 2010), and due to the new characteristics of contemporary internal migration that differ greatly from those of the 1960s (Bonifazi 2013). Scientific research has highlighted the fundamental role played by economic variables (Fielding 2012; Lamonica and Zagaglia 2013), in particular the gross domestic product and (un)employment rate in determining the internal migration characteristics over the last twenty years (Piras 2016). In general, macro-economic variables are fundamental in determining interregional migration flows (Mocetti and Porello 2010). Another approach, which is used more frequently in the international literature, is to compare immigrants' internal migration with respect to native ones (Alba and Nee 1997; Finney and Catney 2012). These studies showed that migratory patterns of natives and immigrants are characterised by profound differences (Casacchia *et al.* 2016). In Italy, the number of foreign residents has increased considerably over the last twenty years. They have gone from just over 300,000 in the nineties to more than five million according to the latest data from the National Institute of Statistics (ISTAT). This growth has led to an increasing body of literature in Italy on the issue of internal migration that compares Italian and foreign-born migration patterns using nationality or the place of birth as a fundamental variable (Casacchia *et al.* 2010; de Filippo and Strozza 2011).

The purpose of this analysis is to verify the role played by both birthplace and the macro-economic variables (in particular the gross domestic product), in Italian interregional migration by distinguishing the migration flows and the population by place of birth. An analysis of 2014's interregional migration is proposed. However, birthplace will not only be used to distinguish born in Italy and born abroad, but also to identify the births in each of the Italian regions. In other words, following American and Canadian approach (Ledent 1980; Kritz and Gurak 2001), we will study the different migratory models distinctly for those born in the twenty Italian regions and for those born abroad. We study interregional migration by applying the gravity model. This model allows us to analyse for each place of birth, in relation to the explanatory variables mentioned above, the role played by the distances (between Italian regions) and the amount of the people residing in the region of origin[15] and destination. To what extent are internal migration flows determined by the different sizes of the population in the region of origin and destination? What role does distance play in interregional migration flows? How much and how does internal migration depend on the place of birth? Do individuals born abroad or born in the Italian regions show a greater propensity to migrate? How is internal migration linked to the size of the population born

[15] In this chapter when we talk about the region of "origin" and "destination" we always refer to migratory flows. Therefore, origin is never the birthplace. We will refer to the birthplace using the phrase "place of birth".

in the same area of those who migrate? How does the gross domestic product affect the interregional flows for each place of birth?

Our main hypothesis is that the size of the population of origin and destination plays an important role in determining internal migration among the Italian regions. On the one hand, the most populous regions of the North are the ones that attract most migratory flows because they represent centres of economic activities and therefore reflect a situation of job opportunities. On the other hand, Southern regions with greater population density (Sicily and Campania for example) push their population out of their boundaries because they have an excess of human capital, due to the lack of dynamism in the labour market. Having considered regions as a territorial unit (instead of municipalities), the distance could have less impact. However, using the place of birth we can verify the different effect of distance (between Italian regions) by place of birth. The hypothesis is that those born in Southern regions have greater propensity to cover long distances because their migration is characterised by searching for a job and in Italy in the North there are better job opportunities. When we consider the place of birth, we analyse jointly the migration from the region of birth, the migration toward the region of birth and all the other interregional migrations. Therefore, another hypothesis is that in this case, Italian migration is not mainly characterised by the dichotomy between North and South (main feature of internal migration in Italy), but it is influenced by a greater propensity to migrate in all Italian regions.

This chapter is organised as follows. Section 2 provides a brief review of the literature on interregional migration studied using the gravity model. Section 3 describes the data and the gravity model. Section 4 provides a descriptive analysis of migration flows. In sections 5 and 6, we present the results obtained through the application of the gravity model and section 7 concludes.

3.2 Interregional migration in Italy and the gravity model application

Italian interregional migration is traditionally characterised by migration flows that originate in the South and terminate in the rest of the peninsula (Bonifazi and Heins 2017). However, from the second half of the nineties to the present, internal migration has profoundly changed (Crainz 1998). In particular, a key role in contemporary internal migration is played by immigrants (Casacchia *et al.* 2010; Bonifazi, Heins and Tucci 2012). The number of immigrants has increased by about 4,500,000 in the last fifteen years, and in 2017 they number more than five million residents (ISTAT 2017). In addition, as the international literature abundantly demonstrates, immigrants are characterised by a larger propensity to migrate than natives (Bartel 1989). However, it should be noted that since the economic crisis the total internal emigration rates of foreigners has begun to decline, reflecting not only the negative economic situation but also their growing presence in the territory has led to a reduction in the gap between the migratory indicators of immigrants and Italians (Bonifazi, Heins and Tucci 2012; Impicciatore and Strozza 2015). Another important innovation for studying internal migration was driven by socio-economic changes. The growing spread of fixed-term contracts, atypical jobs and part-time work have played important roles in the growth of internal migration in Italy (Bubbico, Morlicchio and Rebeggiani 2011). On the one hand, these changes have contributed to the growth of internal migration flows over the last fifteen years; on the other, they have led to the emergence of new origins and destinations of migratory trajectories (Bonifazi and Heins 2017). In particular, Emilia Romagna and Veneto in the Northeast and Tuscany in the Centre have become new poles of both attraction and repulsion of migration flows (Bonifazi, Heins and Tucci 2015). The growth of migration from the Centre-north to the South is also an important novelty (Piras 2016). This growth is traditionally attributed to an increase in the return of those who were born in the South to the South. Returns to the South are, firstly, a consequence of the economic crisis, secondly, because of the labour migration of people using their qualifications obtained in the Centre-North to look for a job in the South and, finally, because of family reunions of the elderly (Panichella 2009; Di Cintio and Grassi 2011; Laganà and Violante 2011; Pugliese 2011; Aina, Casalone and Ghinetti 2015). However, in order to verify whether it is really a return, it is necessary to use an approach that takes into account the place of birth of those who migrate. However, in Italy there are no widespread studies on internal migration that take the place of birth into account (Impicciatore and Strozza 2016). Also the data released by the National Statistical Institute (ISTAT) do not always provide that information (see chapter 1 for an in-depth study). On the contrary, we have proposed to include the birth region of the person who moves in the analysis. To do this, we propose applications of the gravity model that take the origin and destination of the migration flows, the resident population (distinguished by place of birth) and some economic variables into account.

The gravity model applied to internal migration has become a standard approach (Lewer and Van den Berg 2008; De Santis 2010). Gravity models are loosely derived from Newton's law of universal gravitation (1687) which states that the attractive force between two bodies is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. However, in non-physical applications, the distance can be measured in kilometres, time or price and the number of inhabitants in a region usually replaces the mass (Borjas 1989; Anderson 2011). The starting point of the gravity model of migration is the assumption that migration is driven by the attractive force between migrant origin and destination location and impeded by the costs of moving from one region to another (Foot and Milne 1984). This model is currently applied in the case of internal migration analysis (Foot and Milne 1984; Flowerdew 2004) and has been used recently for the analysis of international migration (Kim and Cohen 2010; Beine, Bertoli and Fernández-Huertas Moraga 2015). There are many applications of this model (Desbordes and Eberhardt 2014). The gravity model is also applied to the general case of multiple origin and multiple destination units (regions) in the field of internal migration (Bertoli and Fernández-Huertas Moraga 2013; Bertoli, Brücker and Fernández-Huertas Moraga 2013). Also with reference to Italy, this approach is not unprecedented. In particular, using this model, scholars showed that macro-economic variables (in particular the gross domestic product, employment and unemployment rates) have played a decisive role in influencing Italy's interregional migration in the last few years (Etzo 2011). In addition, it has been possible to show the important role played by the trajectories that originated in the South and terminated in the Centre-north (Lamonica and Zagaglia 2011). The literature also demonstrated the importance of searching for a job as a motive for migration and that of the gross domestic product (Mocetti and Porello 2010). It was also possible to highlight how the gross domestic product has a restraining role in the Centre-north to South direction (Piras 2016). Other applications of the gravity model have also distinguished the migration flows and populations by citizenship, although in other cases immigrants have been identified using the place of birth. In this case it was possible to identify differences in migratory models between Italians and foreigners (Cangiano and Strozza 2005; Casacchia *et al.* 2010). Previous applications of the gravity model proved that the negative effect of distance on migration was stronger for foreigners than Italians (Casacchia *et al.* 2010; Lamonica and Zagaglia 2013).

3.3 Data and methods

For this work, official statistics from ISTAT were used. These data highlight the role played by the place of birth in interregional migration in Italy in 2014. It is important to highlight that in this chapter we refer to origin to indicate the starting region of the interregional flows. Therefore, we never use the word "origin" to talk about the birth area. In order to indicate where the individuals are born, we will always use the locution "place of birth".

In particular, we focused our analysis on the interregional flows from the region i to the region j by place of birth (${}^{b}F_{ij}$) (those born in the twenty Italian regions and those born abroad) using our estimations on ISTAT data (survey APR/4). The data used refers to 2014. Since ISTAT does not provide statistics on the resident population in Italy separately by region of birth (except for the census years), it was necessary to proceed with a statistical estimate to allocate that variable to the Italian population. More precisely, it was necessary to estimate the place of birth of the resident population in each of the 20 Italian regions from 1 January, 2012 to 1 January, 2014 using the 2011 census as the starting point (see chapter 1 for a detailed description of the procedure).

We used the gravity model for the study of interregional migration in Italy in 2014. The gravity model is derived from Newton's law of gravity which states that two bodies attract one another with a force that is proportional to the product of their masses and inversely to the square of the distance between them. The application of the Newtonian model to migration has now become a standard approach (Lewer and Van den Berg 2008; De Santis 2010). In other words, it is believed that the greater the number of residents in the region of origin and destination (the masses of the model), the greater the pull to migrate. Distance, on the other hand, plays a containment role: the larger the distance (between the region of origin and destination), the lower the intensity of the internal migration. We contribute by highlighting the important role played by the place of birth. Therefore, we will use the variable "region of birth" to distinguish the native population in each of the 20 Italian regions and those born abroad. This kind of approach will allow us to study the migratory patterns of each of the 21 birth cohorts. This approach, unpublished in Italy, is based on the North American studies that use the place of birth in the gravity model both with reference to international and internal migration (Karemera, Oguledo and Davis 2000; Lewer and Van den Berg 2008; Melkumian 2009). In fact, the place of birth plays a decisive role in determining internal migration.

Two populations were used in the model, referring both to the region of origin and destination of the migration flows. The first is the traditional population residing in each region (P) (we will refer to it as the "resident population"). The second is the resident population born in the same region of those who migrate (${}^{b}P$). For example, in the case of people born in Piemonte that go from Sicilia to Lombardia, the "residents born in the same region" will be: in the case of the region of origin (Sicilia), the population born in Piemonte residing in Sicilia; in the case of the region of destination (Lombardia) population born in Piemonte residing in Lombardia. When we talk about the place of birth, we refer to individuals born in one of the twenty Italian regions and born abroad.

The application of the gravity model, as already mentioned above, requires information on distances, in our case between the Italian regions. We obtained the distance by locating the centre of each region and then calculating the distances in kilometres between them by using the Vincenty method (1976). This method takes into account the spherical shape of the earth and ensures a calculation accuracy to within half a millimetre.

Finally, in some applications of the gravity model, we also take the gross domestic product (GDP) per capita, both relative to the region of origin and destination into account. In fact, the literature shows that the level of wealth of the territories is an important determinant of migration, especially if they are far apart (Sjaastad 1962; Blackburn 2009).

3.4 Origin and destination of interregional migration by place of birth

Population register data relating to origin and destination of residence are provided by ISTAT by indicating (on request) the details on the birth region. Table 3.1 helps to describe such migration flows by region of birth. From the results, it is clear that for all the regions of birth, the emigrations from the region of birth comprise more than 50% of all observed emigrations. Migrants born in the Southern regions have the highest percentages of emigrations from the region of birth. The results among the immigrations are more heterogeneous. The immigrations in the region of birth represent between 20% and 30% of all immigrations for each region of birth.

Tab. 3.1 Percentages of emigrations and immigrations by region of birth. Italy, 2014

Region of birth	Emigrations from the region of birth	Other emigrations[(a)]	Total	Immigrations in the region of birth	Other immigrations[(b)]	Total
Piemonte	55.5	44.5	100.0	29.7	70.3	100.0
Valle D'Aosta	66.2	33.8	100.0	18.9	81.1	100.0
Lombardia	55.7	44.3	100.0	31.4	68.6	100.0
Trentino Alto Adige	52.1	47.9	100.0	28.3	71.7	100.0
Veneto	55.6	44.4	100.0	28.3	71.7	100.0
Friuli Venezia Giulia	52.3	47.7	100.0	30.2	69.8	100.0
Liguria	56.2	43.8	100.0	29.8	70.2	100.0
Emilia Romagna	54.8	45.2	100.0	31.4	68.6	100.0
Toscana	54.9	45.1	100.0	31.3	68.7	100.0
Umbria	55.9	44.1	100.0	30.1	69.9	100.0
Marche	56.2	43.8	100.0	28.6	71.4	100.0
Lazio	53.4	46.6	100.0	32.8	67.2	100.0
Abruzzo	60.0	40.0	100.0	27.0	73.0	100.0
Molise	57.3	42.7	100.0	23.3	76.7	100.0
Campania	58.3	41.7	100.0	27.5	72.5	100.0
Puglia	56.4	43.6	100.0	27.7	72.3	100.0
Basilicata	57.8	42.2	100.0	22.2	77.8	100.0
Calabria	57.7	42.3	100.0	28.5	71.5	100.0
Sicilia	57.3	42.7	100.0	29.1	70.9	100.0
Sardegna	52.0	48.0	100.0	34.4	65.6	100.0
Italy	**45.8**	**54.2**	**100.0**	**23.7**	**76.3**	**100.0**

[(a)]Emigration from a region other than the region of birth; (b) Immigrations in a region other than the region of birth.

Source: our elaborations on ISTAT data (estimates).

In contrast to what is noted above regarding emigrations, in this case migrants born in the regions of the South have the lowest percentages of immigration in the region of birth. Two regions of birth are exceptions to this. On the one hand, individuals born in Sardegna have the lowest percentage of emigrations from the region of birth and the highest number of immigrations in the region of birth, despite being from a region in the South. On the other hand, migrants born in Valle d'Aosta have the highest percentages of emigrations from the region of birth and the lowest number of immigrations in the region of birth, although they were born in a region in the North.

Figure 3.1 illustrates what has been described so far through a graphical representation of the percentages of outgoing and incoming interregional migration flows distinguished by place of birth. The Figure describes a circle in which the circular segments of different amplitude and colour are placed. Italian regions of origin and destination are placed on the perimeter of the circle. These regions are distinguished by colour. The geographically closest regions are positioned close to each other; in this way the Figure intuitively accounts for the distance of migration flows. Circular segments within the perimeter, indicated above, represent migration flows. The origins and destinations of migrants are represented by the circle's segment. The larger the areas, the larger the migration flows. The direction of the migration flow is encoded by the origin colour, so it is easy to distinguish origin and destination of migration flows. Segments that are closer to the perimeter of the circle represent the percentages of immigrations in a given region. Segments that are less close to the perimeter represent the percentages of emigrations from the region (Sander *et al.* 2014).

Figure 3.1 clearly shows what has already been mentioned about the importance of the place of birth. It also highlights the important role played by the geographical distance. In general, departure and destination regions tend to be geographically closer. However, for those born in the South, there is greater propensity to cover long distances.

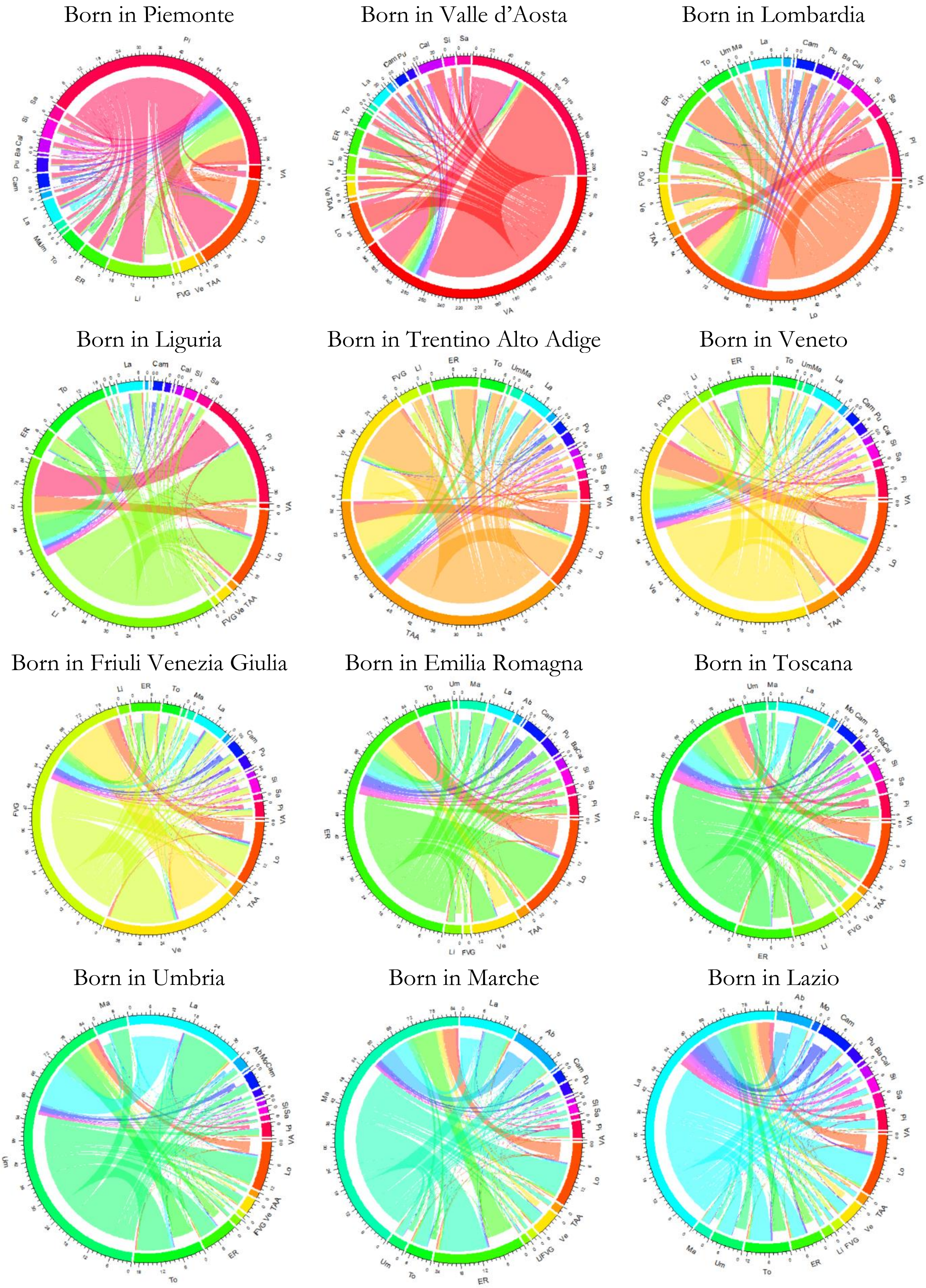
Migrants born in the Northeast region are characterised by a particular concentration of migration flows within the Northeast and towards Lombardia. Migrants born in Emilia Romagna are characterised by a greater heterogeneity of the migration flows, although in this case there is a preference for moving to and from Lombardia.

Among the North-western regions, migrants born in Lombardia are characterised by a greater heterogeneity of the migration flows. For the migrants born in Piemonte the two principal trajectories both originate in Piemonte with their destination in Lombardia and Liguria, two regions of the Northwest. Also in this case, however, the migration flows are quite heterogeneous. Migration flows of individuals born in Valle d'Aosta are concentrated in two main regions: the birth region (Valle d'Aosta) and Piemonte. Individuals born in Liguria migrate to the North-western regions, but they show a not negligible trajectory to and from Tuscany.

Regarding the central Italian regions, migrants born in Tuscany show that the direction for their migration pattern from Liguria and towards Liguria is rather strong. The three main trajectories have their origins and destinations in Lombardia, Emilia Romagna and Lazio. Greater heterogeneity of the migration flows characterises individuals born in Lazio. However, two main trajectories are identified between Lombardy and Tuscany. Migrants born in Umbria and Marche are influenced by the geographical distances in their migration. In fact, the largest migration flows in this case are concentrated in the regions closer to their place of birth.

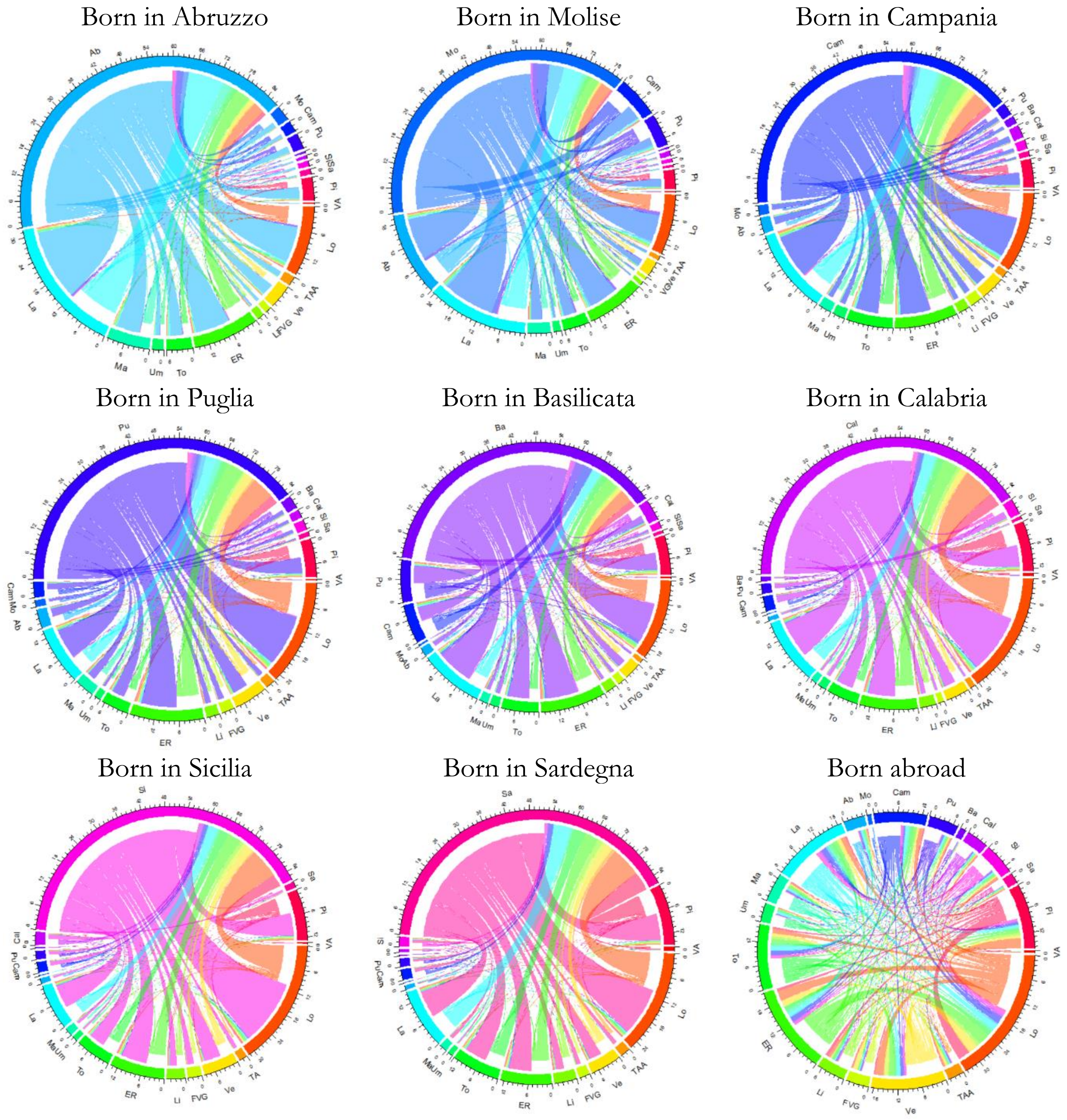
As already mentioned above, migrants born in the regions of the South cover larger geographical distances. However, also in this case the geographical location continues to play an important role. For example, the region of Lazio attracts a large number of migrants born in the closer Southern regions (Abruzzo, Molise, Campania and Puglia). However, regardless of geographical location, Lombardia (a

Fig. 3.1 Circular migration flow between Italian regions by place of birth. Italy, 2014



(follows)

Fig. 3.1 (follows)



Legend: Piemonte=Pi; Valle D'Aosta=VA; Lombardia=Lo; Trentino Alto Adige=TA; Veneto=Ve; Friuli Venezia Giulia=FVG; Liguria=Li; Emilia Romagna=ER; Toscana=To; Umbria=Um; Marche=Ma; Lazio=La; Abruzzo=Ab; Molise=Mo; Campania=Cam; Puglia=Pu; Basilicata=Ba; Calabria=Cal; Sicilia=Si; Sardegna=Sa.

Source: our elaborations on ISTAT data (estimates).

Northern region) represents, for all the people born in the regions of the South, one of the more attractive destinations (and origin) of migration flows. However, some preferential trajectories are identified.

There is a strong concentration of migration flows toward Lombardia for migrants born in Sicilia. Emilia Romagna's capacity to attract residents is also noteworthy, as this region represents an important destination of the interregional migration of individuals born in the Southern regions.

3.5 An application of the gravity model by place of birth

To what extent does the inclusion of place of birth in the gravity model contribute to the current scientific knowledge on internal migration? To answer this question, we move from a traditional application of the gravity model that is only applied using changes in residence, excluding place of birth (Table 3.2). The dependent variable F_{ij} represents the number of changes of residence from the region i to the region j in 2014. Clearly, in order to study only interregional migration we excluded the flows from and to the same region ($j \neq i$). The model's explanatory variables are the populations (P) residing in each region of origin (i) and destination (j), and the distance between them (DS_{ij}):

$$\mathbf{F_{ij} = \alpha \frac{P_i^{\beta 1} P_j^{\beta 2}}{DS_{ij}^{\beta 3}}\ ;} \qquad \mathbf{(29)}$$

The model was linearized by assuming the Poisson distribution in order to account for any zero in the migration flows F_{ij}:

$$\mathbf{F_{ij} \sim Poisson(f_{ij})}$$

$$\mathbf{\ln(f_{ij}) = \ln(a) + \beta_1 \ln(P_i) + \beta_2 \ln(P_j) - \beta_3 \ln(DS_{ij}) + \varepsilon_{ij}}$$

The values of the coefficients applied to interregional flows, as shown in Table 3.2, confirm the role of resident populations and distance, as previously described and in line with the international literature. For the interregional migration flows, the coefficients of the total resident population in the region of origin and in the region of destination assume positive values. Thus, there is a direct effect between the size of the resident populations and the amount of migration. Conversely, the distance between regions has a negative effect.

Tab. 3.2 Parameter estimates of the log-normal gravity model applied to interregional migration flows. Explanatory variables: resident populations and distances. Italy, 2014

Variables	Estimate	p-val
(Intercept)	4.901e+00	***
Total resident population in the region of origin (P_i)	2.499e-07	***
Total resident population in the region of destination (P_j)	2.685e-07	***
Distance (DS_{ij})	-4.412e-07	***
AIC: 147,360		

Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

In order to move a step further toward the study of the place of birth, the gravity model was applied to the interregional migration flow by place of birth. In this case, the dependent variable ${}^{b}F_{ij}$ is obtained not only from the matrix consisting of the changes of residence from the region i to the region j, but also by distinguishing 21 places of birth (b = 1,2, ..., 21) of migrants, corresponding (as explained previously) to migrants born in the twenty Italian regions and migrants born abroad. Thus, the resulting vector consists of 20 * 19 * 21 = 7,980 rows. In formulas, the equation can be expressed as follows:

$^{b}F_{ij} \sim \textbf{Poisson}(^{b}f_{ij})$

$\ln(^{b}f_{ij}) = \ln(a) + \beta_1 \ln(P_i) + \beta_2 \ln(P_j) - \beta_3 \ln(DS_{ij}) + \varepsilon_{ij}$

The resulting coefficients are almost identical compared to the results in Table 3.2. The AIC[16] in this case is 1,242,437 (Table 3.3). The introduction of the distinction by place of birth, as expected, increases the explanatory capacity of the model. This means that other variables play a significant role. This result, though not unexpected, encourages an in-depth analysis of the internal migration by place of birth.

Tab. 3.3 Parameter estimates of the log-normal gravity model applied to interregional migration flows by place of birth. Explanatory variables: resident populations and distances. Italy, 2014

Variables	Estimate	p-val
(Intercept)	1.857e+00	***
Total resident population in the region of origin (P_i)	2.499e-07	***
Total resident population in the region of destination (P_j)	2.685e-07	***
Distance (DS_{ij})	-4.412e-07	***
AIC: 1,242,437		

Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

An explanatory economic variable, the gross domestic product per capita (GDP), has been added to the previous model (Table 3.4). It is interesting to see whether the gravity model, applying place of birth, is affected by GDP, both relative to the region of origin and destination of migration flows. In this case, the equation assumes the following form:

$^{b}F_{ij} \sim \textbf{Poisson}(^{b}f_{ij})$

$\ln(^{b}f_{ij}) = \ln(a) + \beta_1 \ln(P_i) + \beta_2 \ln(P_j) - \beta_3 \ln(DS_{ij}) + \beta_4 \ln(GDP_i) + \beta_5 \ln(GDP_j) + \varepsilon_{ij}$

As highlighted in Table 3.4, GDP plays a role that international literature has already highlighted on several occasions (Borjas 1989; Lewer and Van den Berg 2008; Piras 2016). In other words, the GDP in the region of origin has a negative effect and the reverse is true for the region of destination. As is well-known, GDP is an indicator of the economic well-being of a territory (though crude and subject to debates). Moreover, as GDP increases (and therefore the welfare) in the region of origin, fewer migrations from that territory occur. In contrast, a high GDP in the region of destination increases its attractiveness and leads to an increase in immigration flows. Another interesting aspect is that the introduction of the GDP, as an explanatory variable, made the effect of distances on internal migration even more important compared to the results in Table 3.3. The new model - obtained by introducing explanatory variables like GDP in the region of origin and destination of interregional migration flows - fits better than the previous model (lower AIC than in Table 3.3).

[16] The Akaike information criterion (AIC) is an estimator of the relative quality of statistical models for a given set of data. When comparing models fitted by maximum likelihood to the same data, the smaller the AIC, the better the fit.

Tab. 3.4 Parameter estimates of the log-normal gravity model applied to interregional migration flows by place of birth. Explanatory variables: resident populations, distances and GDP. Italy, 2014

Variables	Estimate	p-val
(Intercept)	2.434e+00	***
Total resident population in the region of origin (P_i)	2.866e-07	***
Total resident population in the region of destination (P_j)	2.577e-07	***
Distance (DS_{ij})	-6.704e-07	***
GDP in the region of origin (GDP_i)	-3.370e-05	***
GDP in the region of destination (GDP_j)	1.054e-05	***
AIC: 1,226,546		

Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

In relation to the region of origin and destination, in addition to the total number of residents (P_i and P_j), we added the explanatory variable of residents born in the same region as those who migrate (${}^bP_i$ and ${}^bP_j$). As we explained in the section 3.3 the variable ${}^bP$ represent a subset of the total resident population in the region considered. For example, if we consider a migration from Sicilia (region of origin of the migration) to Lombardia (region of destination of the migration) of individuals born in Campania, with respect to the region of origin (i) of the interregional migration flow, ${}^bP_i$ represents people residing in Sicilia born in Campania. With reference to the region of destination (in this example Lombardia) (j) of the interregional migration flow, ${}^b\mathbf{P}_j$ represents people residing in Lombardia born in Campania. The variable ${}^bP$ has the advantage of indicating how the propensity to migrate changes with the increase of the resident population born in the same region as those who migrate. Turning to our example, how does the propensity of individuals born in Campania change when the number of individuals born in Campania increases in the region of origin (or destination) of the interregional flows? The equation, in this case, assumes the following formula:

$$\mathbf{{}^bF_{ij} \sim Poisson({}^bf_{ij})}$$

$$\mathbf{\ln({}^bf_{ij}) = \ln(a) + \beta_1 \ln(P_i) + \beta_2 \ln(P_j) - \beta_3 \ln(DS_{ij}) + \beta_4 \ln(GDP_i) + \beta_5 \ln(GDP_j) + \beta_6 \ln({}^bP_i) +}$$

$$\mathbf{+ \beta_7 \ln({}^bP_j) + \varepsilon_{ij}}$$

In general, as described for the total resident populations (P_i and P_j), the explanatory variable of residents born in the same region as those who migrate (${}^bP_i$ and ${}^bP_j$) has a direct effect on internal migration (Table 3.5). The most significant result is that the resident populations distinguished by place of birth have larger coefficients than the total resident population (P_i and P_j). In addition, compared to the previous model (Table 3.4), the GDP coefficient in the region of destination is higher. In other words, introducing the explanatory variable of residents born in the same region as those who migrate, increases the importance of GDP in attracting migration flows to the region of destination.

Tab. 3.5 Parameter estimates of the log-normal gravity model applied to distinct interregional flows by place of birth. Explanatory variables: resident populations, residents born in the same region, distances, and GDP. Italy, 2014

Variables	Estimate	p-val
(Intercept)	2.720e+00	***
Total resident population in the region of origin (P_i)	1.207e-07	***
Total resident population in the region of destination (P_j)	1.988e-07	***
Residents in the region of origin, born in the same region of those who migrate (${}^bP_i$)	6.342e-07	***
Residents in the region of destination, born in the same region of those who migrate (${}^bP_j$)	4.414e-07	***
Distance (DS_{ij})	-6.834e-07	***
GDP in the region of origin (GDP_i)	-3.306e-05	***
GDP in the region of destination (GDP_j)	9.546e-06	***
AIC: 676,906		

Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

A further amendment to the model, which we applied, was the introduction of qualitative explanatory variables (${}^bPB$) that correspond to the migrants' place of birth (migrants born in the 20 Italian regions and migrants born abroad). Therefore, ${}^bPB$ is a number that ranges from 1 to 21. Each number corresponds to a specific place of birth (20 Italian regions and born abroad) (${}^bPB = b = 1,2, ..., 21$). In this way, we can study the effects on internal migration for each place of birth distinctly. This variable has been added to the model seen above (Table 3.5), but we have in this case excluded the explanatory variables for resident population born in the same region of those who migrate (${}^bP_i$ and ${}^bP_j$) in order to gain greater insight. The equation obtained is as follows:

$$\mathbf{{}^bF_{ij} \sim Poisson({}^bf_{ij})}$$

$$\mathbf{\ln({}^bf_{ij}) = \ln(a) + \beta_1 \ln(P_i) + \beta_2 \ln(P_j) - \beta_3 \ln(DS_{ij}) + \beta_4 \ln(GDP_i) + \beta_5 \ln(GDP_j) + \beta_6 \ln({}^bP_i) +}$$

$$\mathbf{+ \beta_7 \ln({}^bP_j) + {}^b\beta_8 \ln({}^bPB) + \varepsilon_{ij}}$$

The reference group are the migrants born in Piemonte. As in the hypothesis, the strongest effects are all concentrated among migrants born in the South and migrants born abroad. The strongest effects (compared to migrants born in Piemonte) are for migrants born in the regions with the most established emigration tradition (born in Campania, Sicilia, Puglia and Calabria). The rest of the Southern birthplaces have inferior effects compared to those born in Piemonte. Among the regions of Central Italy, only migrants born in Lazio have a coefficient greater than 0 in comparison with the referent group. Moving to the regions of the North, migrants born in Lombardia are the only ones that produce larger effects than the migrants born in Piemonte. Emilia Romagna and Veneto have negative coefficients but close to zero, confirming an increasing role played by these regions in the context of internal migration (Bonifazi and Heins 2017). The remaining explanatory variables show coefficients rather similar to those already mentioned.

Tab. 3.6 Parameter estimates of the log-normal gravity model applied to distinct interregional flows by place of birth. Explanatory variables: resident populations, residents born in the same region, distances, GDP and places of birth. Italy, 2014

Variables	Estimate	p-val
(Intercept)	2.326e+00	***
Born in Piemonte (reference)		
Born in Valle d'Aosta	-3.526e+00	***
Born in Lombardia	5.730e-01	***
Born in Trentino Alto Adige	-1.999e+00	***
Born in Veneto	-1.726e-01	***
Born in Friuli Venezia Giulia	-1.396e+00	***
Born in Liguria	-7.257e-01	***
Born in Emilia Romagna	-2.600e-01	***
Born in Toscana	-4.53e+02	***
Born in Umbria	-1.521e+00	***
Born in Marche	-1.109e+00	***
Born in Lazio	3.079e-01	***
Born in Abruzzo	-8.601e-01	***
Born in Molise	-1.837e+00	***
Born in Campania	1.313e+00	***
Born in Puglia	7.632e-01	***
Born in Basilicata	-1.084e+00	***
Born in Calabria	2.910e-01	***
Born in Sicilia	9.156e-01	***
Born in Sardegna	-5.890e-01	***
Born abroad	1.481e+00	***
Total resident population in the region of origin (P_i)	2.866e-07	***
Total resident population in the region of destination (P_j)	2.577e-07	***
Distance (DS_{ij})	-6.704e-07	***
GDP in the region of origin (GDP_i)	-3.370e-05	***
GDP in the region of destination (GDP_j)	1.054e-05	***
AIC: 929,979		

Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

3.6 The role played by each place of birth in internal migration

So far, the proposed applications do not completely show the role played by each place of birth in internal migration. For this reason, we propose the latest application of the gravity model that retains all the explanatory variables described in the previous paragraph, but also adds the interactions between the factor variable corresponding to the place of birth (^{b}PB)[17]. Only the variables relating to GDP in the place

[17] As already mentioned, ^{b}PB is a qualitative explanatory variables that ranges from 1 to 21. Each number corresponds to a specific place of birth (20 Italian regions and born abroad) (^{b}PB =b = 1,2, ..., 21).

of birth and destination are inserted without interaction. This decision results in the loss of statistical significance of the model in case of an interaction between GDP and the place of birth (^bPB). Therefore, the resulting equation is as follows:[18]

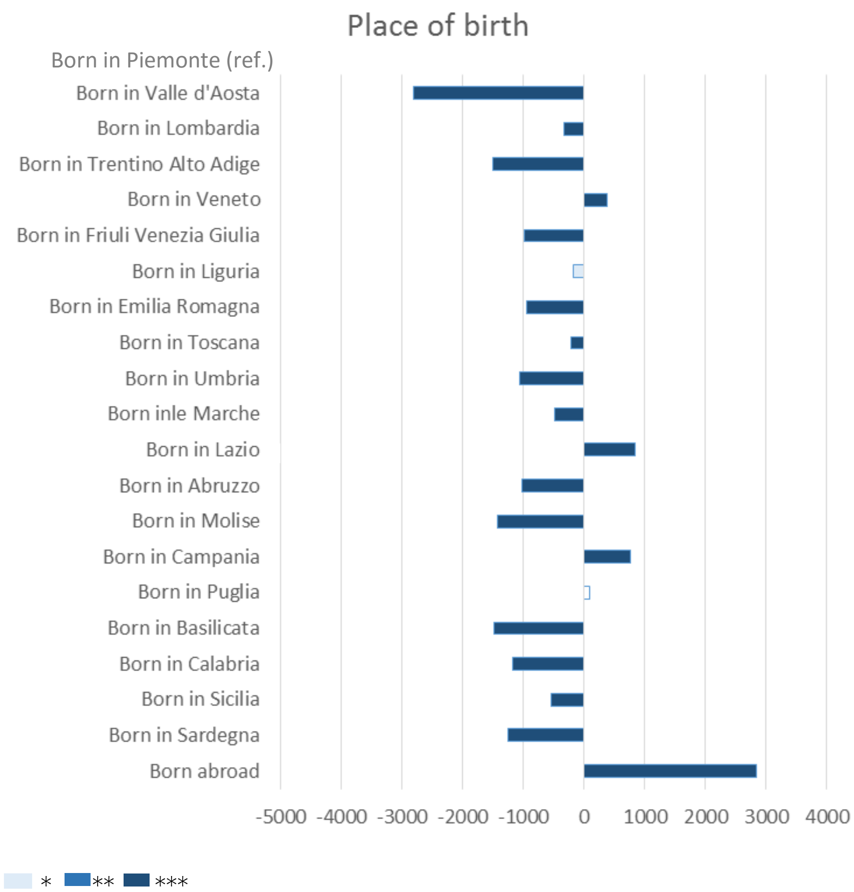
$$^bF_{ij} \sim \mathrm{Poisson}(^bf_{ij})$$

$$\ln(^bf_{ij}) = \ln(a) + \beta_1 \ln(P_i) * {}^b\beta \ln(^bPB) + \beta_2 \ln(P_j) * {}^b\beta \ln(^bPB) - \beta_3 \ln(DS_{ij}) * {}^b\beta \ln(^bPB) +$$

$$+ \beta_4 \ln(GDP_i) + \beta_5 \ln(GDP_j) + \beta_6 \ln(^bP_i) * {}^b\beta \ln(^bPB) + \beta_7 \ln(^bP_j) * {}^b\beta \ln(^bPB) + {}^b\beta_8 \ln(^bPB) + \varepsilon_{ij}$$

The AIC of this model (Figure 3.2.1) is equal to 130,479, and is therefore a better fit than the first applied gravity model where the place of birth was not considered (in Table 3.2 the AIC was equal to 147,360). Figure 3.2.1 shows the coefficients of the explanatory variables corresponding to the place of birth PB^b (in this case without interactions). The reference group are the migrants born in Piemonte. Interregional migrants born abroad have the larger effect. They have larger coefficients than migrants born in Campania, Lazio, Piemonte and Veneto. All other regions have negatives coefficients.

Fig. 3.2.1 Parameter estimates of the log-normal gravity model applied to distinct interregional flows by place of birth. Explanatory variable: place of birth. Italy, 2014

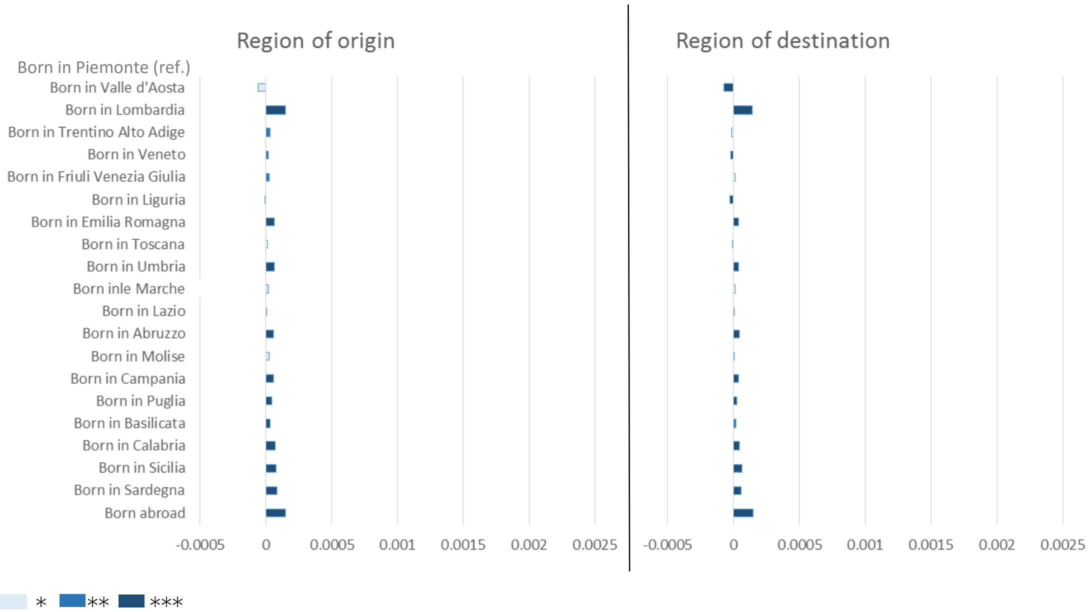


AIC: 130,479
Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

[18] As already mentioned, we excluded the flows from and to the same region ($j \neq i$) and the resulting vector consists of 20 * 19 * 21 = 7,980 rows.

Moving to a discussion of the interaction between the place of birth and the size of the population residing in the region of origin ($\beta_1 \ln({}^bP_i) * \beta \ln({}^bPB)$) and in the region of destination ($\beta_1 \ln(P_j) * {}^b\beta \ln({}^bPB)$), the results appear rather negligible, although statistically significant (Figure 3.2.2). In fact, the coefficients obtained are particularly close to 0 (from a minimum of $-5.759e^{-08}$ for migrants born in Valle d'Aosta, up to $1.483e^{-07}$ for migrants born abroad).

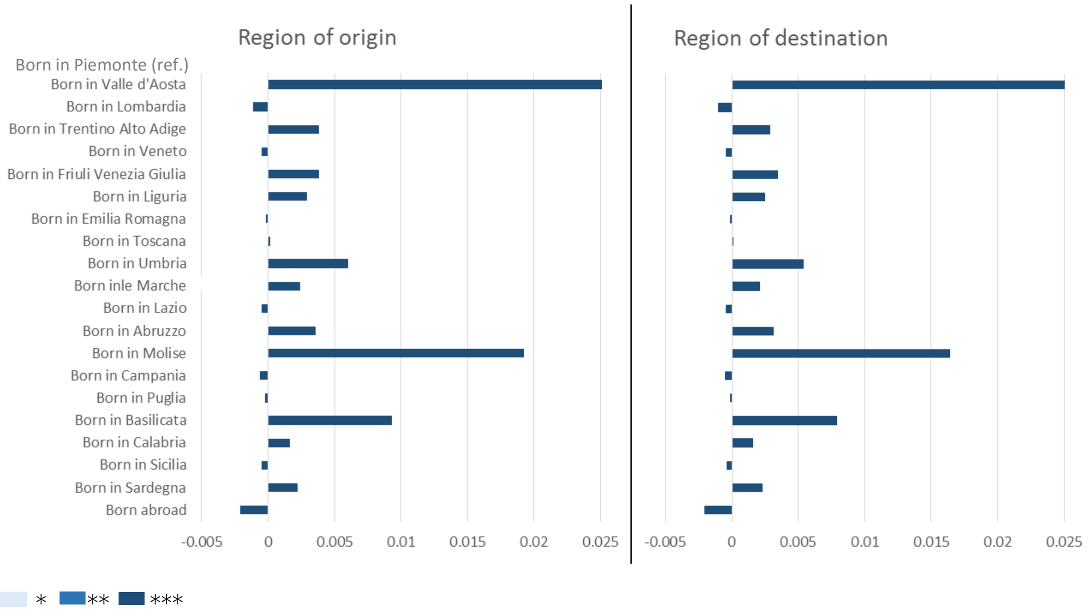
Fig. 3.2.2 Parameter estimates of the log-normal gravity model applied to distinct interregional flows by place of birth. Interaction between the place of birth and the resident population. Italy, 2014



AIC: 130,479
Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

Using in this application the resident population born in the same region of those who migrate (P^b) provides new important findings on the subject. Figure 3.2.3 shows on the left the interaction between the places of birth (PB^b) and the region of origin ($\beta_1 \ln(P^b{}_i) * \beta^b \ln(PB^b)$) and on the right side the interaction between the places of birth (PB^b) and the region of destination ($\beta_1 \ln(P^b{}_j) * \beta^b \ln(PB^b)$). The coefficients are quite similar to each other (Figure 3.2.3). The results show that the coefficients are highest for those born in Valle d'Aosta, Molise and Basilicata. In other words, more than in any other region in question, the risk of migrating of individuals born in Valle d'Aosta increases as the resident population born in Valle d'Aosta grows (for both the region of destination and origin). Molise and Basilicata have the next two highest coefficients. The first two regions (Valle d'Aosta and Molise) have the smallest geographic area, and, together with the third region (Basilicata), are characterised by low levels of internal migration. The reverse is true for those born in regions with high interregional migration flows. In particular, migrants born in Sicilia, Campania and Lazio. For individuals born in those places of birth (compared to the others), it is less important to meet residents with their same place of birth in the region of destination (or origin). Similarly, those born in Lombardia, Veneto and Emilia Romagna show significant coefficients. The lowest negative coefficient is obtained for those born abroad, for which, as seen in paragraph 3.3, migration is more heterogeneous and spread throughout the Italian territory.

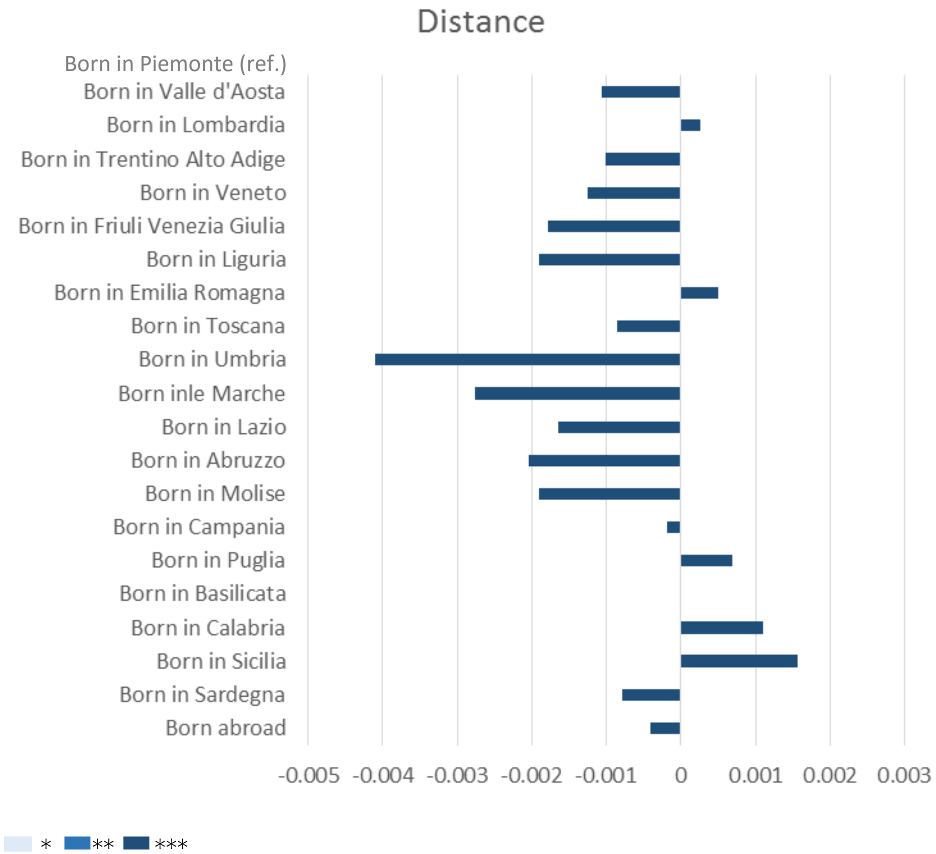
Fig. 3.2.3 Parameter estimates of the log-normal gravity model applied to distinct interregional flows by place of birth. Interaction between the place of birth and the residents born in the same region compared to those who migrate. Italy, 2014



AIC: 130,479
Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

Finally, the interaction between place of birth and distance ($\beta_1 \ln(DS_{ij}) * {}^b\beta \ln({}^bPB)$) was summarized in Figure 3.2.4. Migrants born in Sicilia are characterised by their larger coefficient. In other words, migrants born in Sicilia have the greatest propensity to cover long distances. This result is partly due to both the geographical location of Sicilia (the most southern region of Italy) and because the richer regions of Italy are located in the North. In general, all the migrants born in regions geographically located below Campania show positive coefficients. Therefore, it is evident in this analysis that an important role is played by the geographical location and by the Italian dichotomy between the North and South. Except for Lombardia and Emilia Romagna (important poles of attraction for internal migration in Italy), all other regions have negative coefficients. To confirm the role played by the geographical position, two regions of Central Italy are the ones for which the distances have the most conservative effect: Umbria and Marche.

Fig. 3.2.4 Parameter estimates of the log-normal gravity model applied to distinct interregional flows by place of birth. Interaction between the place of birth and the distance. Italy, 2014



AIC: 130,479
Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001
Source: our elaborations on ISTAT data (estimates).

3.7 Conclusion

The place of birth was confirmed as an important factor to understand internal migration in Italy. Although the concentration of migration flows from and to the place birth is not irrelevant, the descriptive analysis has allowed us to highlight some of the major trajectories in each Italian region by birth cohort and to identify specific migratory patterns. For example, individuals born in the regions of the South cover longer geographical distances, while the ones born in the Northeast tend to focus more on interregional migration towards the nearest regions.

Yet, some regions have shown specific migratory patterns. For example, those born in Valle d'Aosta concentrate their migrations towards Piemonte, which contrasts with those born in Lombardia, who are distributed across the territory in a heterogeneous way. In addition, those born abroad demonstrate a greater propensity to migrate because of their great diversification of origins and destinations of migration flows, and an extremely different migration pattern than individuals born in the Italian regions.

The application of the gravity model has confirmed the above and has enabled us to emphasise important aspects of migration flows in Italy distinctly by place of birth. Firstly, we showed that using the interregional flows distinctly by place of birth increased the ability of the model to explain the phenomenon, compared to the traditional gravity model (without the place of birth). This result allowed for further investigation. Therefore, we introduced new explanatory variables. The results confirmed our fist hypothesis that the propensity to make an interregional migration changes proportionally to the number of residents in the region considered. The model showed also that the effect is stronger if we introduce the resident population born in the same region as those who migrate. In other words, the population born in the same region as migrants determined the amount of migration flows even more than the total resident population.

With regard to distances, our hypothesis was that individuals born in the South have greater propensity to cover long distances compared to people born in the Centre-north. The results highlighted that an important role is played by the geographical position. Migrants born in Sicilia and Calabria, which are the southernmost regions, have the highest propensity to cover long distances. This result is also a consequence of a particular concentration of migration flows linking the two regions with Lombardia. Except for those born in Lombardia, Piemonte and Emilia Romagna, the migration model explains more than their geographical position. The Italian dichotomy between Centre-north and South emerges. The former is characterised by a richer and more developed economy, while the South pushes its own population to migrate from less developed and poorer regions towards the richer Centre-north. For those born abroad, distances restrain migrations less than for those born in the Centre-north (except for those born in Lombardia, Piemonte and Emilia Romagna) and more for those born in the South (except for those born in Abruzzo and Molise). In conclusion, our last hypothesis (Italian migration is not mainly characterised by the dualism between North and South) is partially falsified, because the dualism between North and South is confirmed also if we use the flows by place of birth.

The introduction of GDP has allowed us to verify the effect that has already been highlighted by the international literature. GDP has a negative coefficient compared to the region of origin and a positive one in the region of destination. As expected, the greater the level of well-being in the region of origin, the lesser the propensity to migrate, and the opposite effect with respect to GDP in the region of destination. GDP plays a larger role when we use the resident population as an explanatory variable distinctly by place of birth compared to the gravity model applied without this variable.

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CHAPTER 4

WHY DO THEY MOVE?
CHARACTERISTICS AND DETERMINANTS OF INTERNAL MOBILITY IN ITALY[19]

4.1 Introduction

Internal mobility plays a key role in determining Italian geographical and social characteristics (Salvini and de Rose 2011); however, its importance has only recently been re-evaluated. After the end of the great internal mobility of the post-war period, the interest of scholars has gradually reduced. The twenty years between 1955 and 1975 were those with the most intense internal mobility observed until now (Pugliese 2002). After the reduction of internal mobility in the 1970s and 1980s, scholars began to focus on international movements of people and to neglect the internal ones (Bonifazi 2015; Livi Bacci *et al.* 1996; Pugliese 2011). Only recently, after the new increase in internal mobility flows since the second half of the 1990s, Italian scholars have begun to analyse it again (Aina *et al.* 2015; Bertolini *et al.* 2006; Bonifazi 2015) and to consider it as a cause or a consequence of social changes (Pollini and Scidà 2002). Socio-economic differences among regions have always been one of the main reasons for internal mobility in Italy (Ricciardo *et al.* 2011). The strong social, cultural and economic differences among regions and macro-areas have attracted the interest of scholars for the purpose of studying the process of redistribution of the resident population (Bonifazi 1999). Another key role in analysing internal mobility concerns the rapid and significant increase in the foreign presence on the territory. Resident immigrants increased from 1,341,209 in 2002 to 4,922,085 in 2014, equal to 8.1% of the entire resident population of Italy, and a large part of the growing number of transfers of residence can be attributed to the internal mobility of foreign citizens (Bubbico 2014; Casacchia *et al.* 2010).

However, much remains to be explored with respect to the determinants of such flows of migration (Bonifazi 2015; Casacchia et al. 2010), mainly because of the absence of a survey specifically dedicated to internal mobility (Bubbico 2014). As a matter of fact, the Italian Institute of Statistics (from now on, ISTAT) does not provide a survey with the specific objective of studying internal mobility. In the present paper, we use the Labour Force Survey conducted in 2014. This survey allows us to observe the demographic and socio-economic characteristics of internal migrants. An additional analysis based on the Italian population registers (registri anagrafici) has been developed in order to outline a general framework of the recent trends with respect to internal mobility in Italy.

The main aim of this paper is to provide a further contribution to the current literature and to analyse the main determinants of mobility between provinces (medium- and long-distance movements). In general, we do not consider the origin and destination of movements; however, according to its relevance, we also briefly consider migration flows in the south-north gradient. We analyse demographic

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characteristics (in particular sex, age and place of birth of those who move) and cross-analyse these with the main socio-economic (especially employment, income, education, area of residence) and household characteristics (such as household and type of couple relationship and parenthood).

The paper is structured as follows. In the next section, we look at Italian mobility using quantitative and updated macro-data of residents in order to describe the context. Then we provide a theoretical background of the main demographic and socio-economic determinants of internal mobility. In section four, we describe the micro data and the method used for further analysis. In the next two sections, we present the results of our analyses. The last section provides some final remarks.

4.2 The Internal Mobility in Italy: An Overview

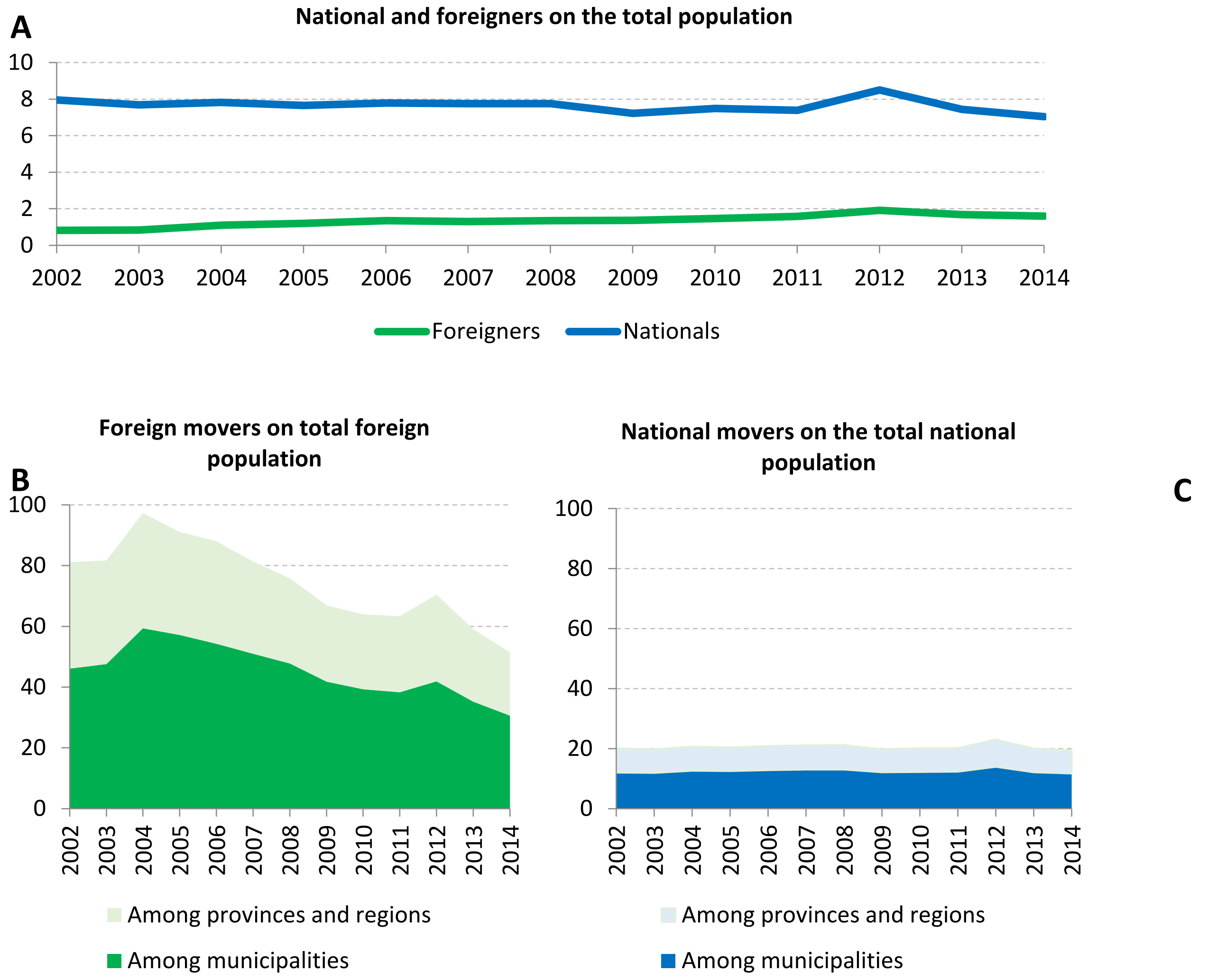
In 2014 in Italy there were 1,313,176 total internal migrants (of which 39.7% registered in another province). The significant increase in foreign population has affected internal mobility in the last two decades (de Filippo and Strozza 2011), as international migrants represent an increasing part of internal migrants. Figure 1A shows that their gross rate for mobility among provinces has doubled, from 0.8‰ in 2002 to 1.6‰ in 2014. Conversely, Italian gross rate slightly decreased from 2002 to 2008 (7.9‰ and 7.7‰ respectively); during the economic crisis of 2009 the rate dropped to 7.2‰ and it reached 7.0‰ in 2014. In 2012 there was a particularly high value both for Italians and for foreigners, due, however, not to a real increase in internal migration, but to a change in Italian law that modified the procedure for registration of change of residence (Bonifazi et al. 2014). The picture is somehow different if the gross migration rate is calculated based on the referent population (Figure 1B and 1C).

Among foreigners, the propensity to migrate was very high during the first part of the observed period (Bonifazi et al. 2012). The peak was reached in 2006 (31.2‰), but after that year the trend was negative and the rate dropped to 19.5‰ in 2014 (Figure 1B). Among Italians, the propensity to migrate was roughly constant with a slight decrease after 2012 (Figure 1C). Thus, the mobility intensities of Italians and foreigners were initially very different, but, in recent years, they have tended to approximate, in part because of the economic crisis and in part because of a more stable foreign presence (Bonifazi et al. 2012).

Similarly, a comparison between males and females shows a rapprochement between the two migration patterns (Bonifazi et al. 2012). Figure 2A shows the absolute number of people who moved internally, by sex, from 2002 to 2014. The Figure refers to the total level of internal mobility (also within the same province). The number of migrant women in 2002 was less than 600,000, then peaked in 2008 (more than 685,000) and reached 650,000 in 2014, after a decline during the economic crisis. Similarly, a comparison between males and females shows a rapprochement between the two migration patterns (Bonifazi et al. 2012).

The sex ratio, with respect to the total level of internal mobility, remained fairly constant until 2007, with values around 105%; from 2008 the rate began to decline until 2010 (99.4%), as a result not only of the growing number of females, but mostly due to the negative trend in the number of males during the years of the economic crisis. In the end, the relationship between the two genders in 2014 shows an increase of this gap in favour of women, with the lowest value in the period (98.8%).

Figure 1 Gross migration rates by type of mobility and citizenship. Period 2002-2014[20].

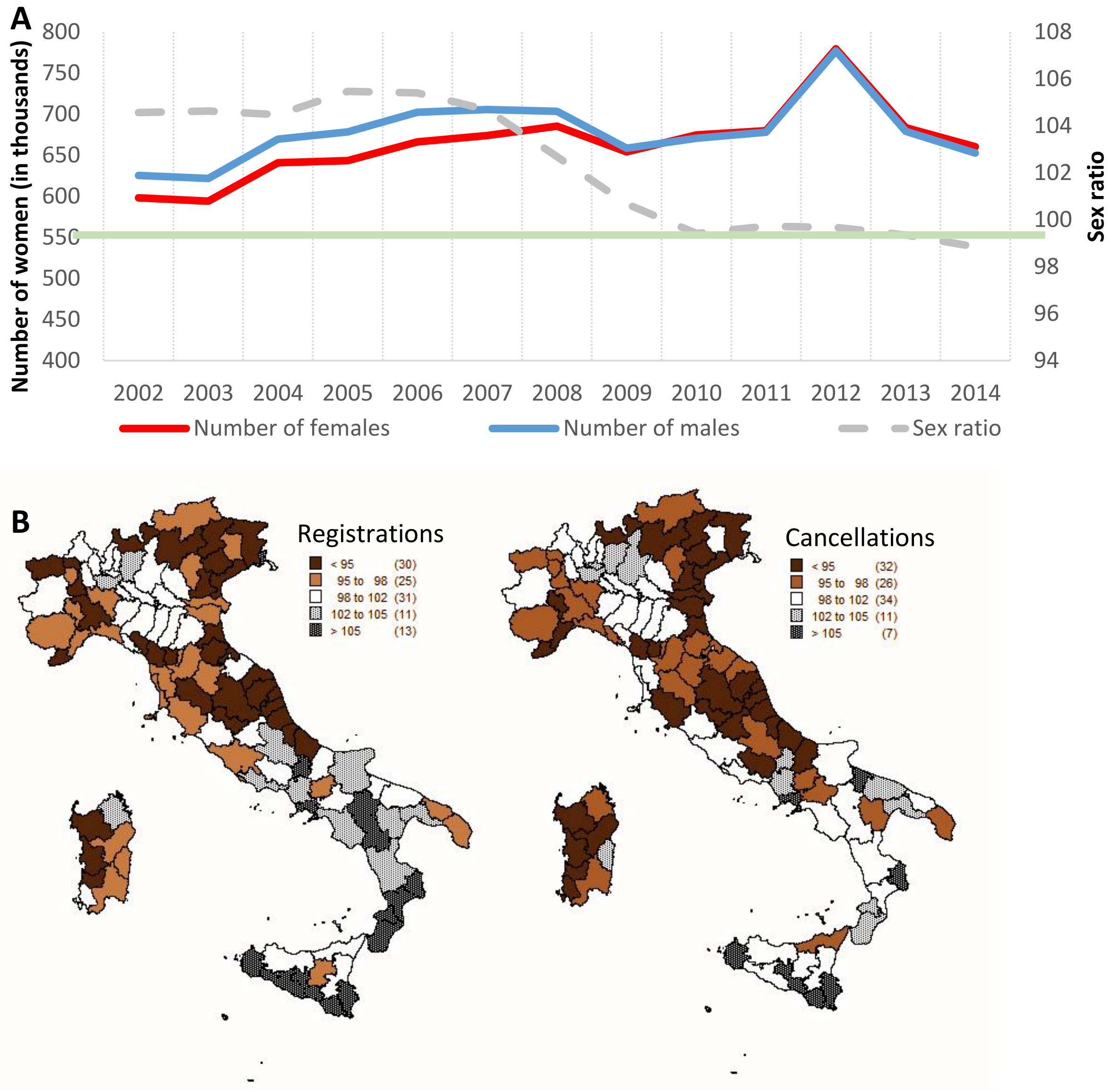


Source: Our elaboration on Population Registers.

Female migration patterns are not homogeneous throughout the peninsula. The vector map in Figure 2B shows the sex ratio of migrants for each Italian province. In this case, we consider all residence changes, making the cartogram for registration and for cancellation very similar. In these maps, there is a prevalence of male migrants in the south, while there is strong female migration in central Italy. In the end, the northern area represents a very heterogeneous area with a particularly high prevalence of migrant women in the north-east, a gender balance in Emilia-Romagna and the presence of specific provinces with predominantly male migrants (as the case of some provinces in Lombardy).

[20] In this chapter the annotation for figures and tables is different compared to the rest of the thesis. In order to preserve the original article, we do not changed the numbering. Therefore, we do not use the annotation 4.1; 4.2; etc. but we use 1; 2 ; 3; etc.

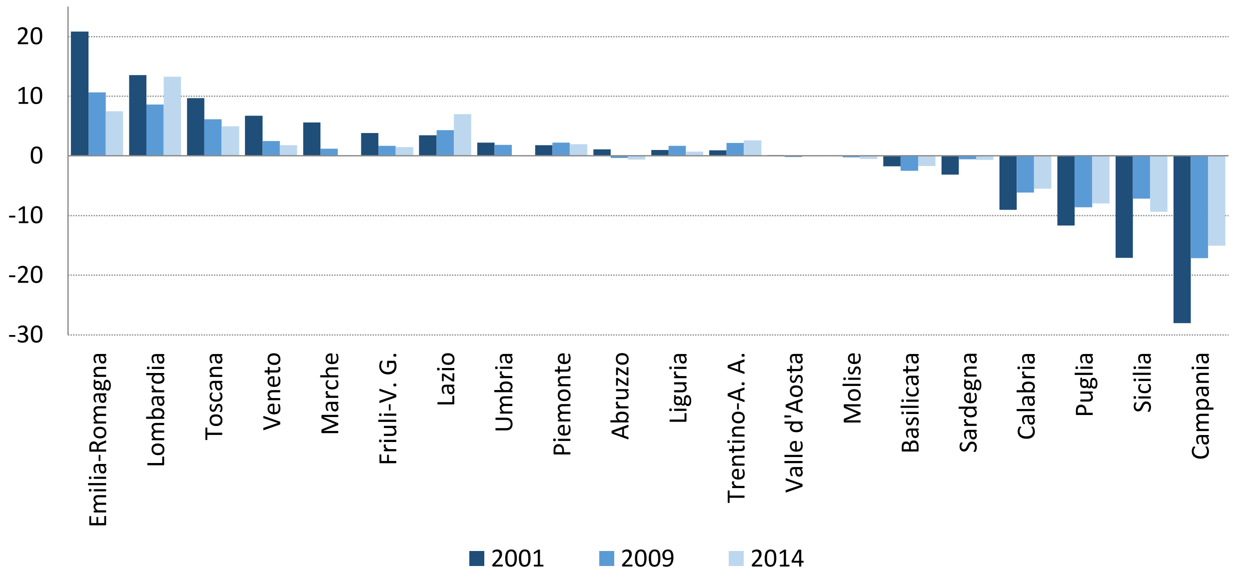
Figure 2 Sex ratio and absolute number by sex from 2002 to 2014 (a) and vector map of sex ratio of registrations and cancellations in 2014 (b).



Source: Our elaboration on Population Registers.

In general, the highest number of interregional changes of residence in 2014 occurred within northern Italy (21.8% of interregional mobility). Migration from southern to northern Italy represented 21.3% of the interregional mobility; this percentage increases to 32.6% if we add to the previous quota also migration from the south to the centre (ISTAT 2015). Figure 3 shows the interregional net migration of 2001, 2009, and 2014 by region. In the regions of the northern and central areas, the values were positive in respect to the south, where the values in 2014 were consistently negative. Northern Italy has the highest interregional net migration (+29,387 in 2014). The south continues to be the area that gives rise to migration of the longest distance and that pushes the migrant beyond its own boundaries; in effect, in 2014 the total net migration was -41,366 (of which -15,548 to the north-west, -14,599 to the centre and -11,219 to the north-east). Looking at the general trends, the values of net migration decrease across the three observed years among the regions of the north and centre (even with some exceptions, such as Lazio or Lombardy). By contrast, the same values approached zero in the south. In other terms, the economic crisis had the effect of depressing the mobility throughout the peninsula. In addition, in recent years, the observed mobility from the north (or the centre) to the south regards, not exclusively but more than before, return-migration to the places of origin of people for whom the migration failed to meet their expectations because of the economic recession (Bonifazi et al. 2015)[21].

Figure 3 Interregional net migration by region. Years 2001, 2009 and 2014.



Source: Our elaboration on Population Registers.

4.3 Theoretical Background

Analysing the characteristics of people who move between regions compared to the dominant non-migrant group, the selection hypothesis argues that migrants constitute a select group in terms of observed and unobserved characteristics. The selection operates when internal migrants can be characterized by different personal traits or behaviours than those who do not change residence. In general, migrants tend to be young, more educated, single and childless, and open to innovation. They also are frequently more able and motivated by a desire for personal achievement (Borjas et al. 1992; Chattopadhyay et al. 2006; Gabrielli et al. 2007). The differential characteristics of migrants, despite their places of origin and destination, with respect to the dominant group, may be due to compositional factors. Thus, demographic, household and employment characteristics play a very important role in analysing internal mobility, as evidenced by the international literature. What follows is a brief review of the main results of the research that is of interest to the present work.

[21] The phenomenon of return migration is complex and assumes different characteristics depending on the reference period. We synthetically consider two opposite approaches. According to the neoclassical theory, return migration occurs when the migrants' expectations of improved earnings are not met. Thus, migration concerns a negative experience. Conversely migration can have a positive meaning when it is a temporary experience in a wider life project. In the latter approach, return migration is the final sequence of a migration project and assumes a positive meaning (Panichella 2009).

Generally speaking, scholars link internal flows, especially of long distances, to employment issues. People move from poor-developed areas to the richest and dynamic ones (Böheim and Taylor 2007; Sjaastad 1962). Destination locations are characterized by employment opportunities and good labour-market conditions (Blackburn 2009). Internal mobility affects income and employment status; in particular, scholars showed two opposite positions: often those who move are more likely to increase their income (Ahmed and Slrageldin 1994); however there is also a significant portion of migrants that worsen their occupational conditions (Geist and McManus 2008).

Another significant part of the literature studies the relationship between internal mobility and marital status or household characteristics (Bubbico 2014; Morrison and Clark 2011). A significant part of internal mobility is linked to couple formation (Clark and Onaka 1983; Mulder 1992). Married people have a lower propensity to move long distances compared to mono-nuclear households or cohabiting individuals (Boyle et al. 1999). Common explanations for this phenomenon among scholars are that married people are more bound to owned houses, that the decision to change residence must take into account the careers of at least two individuals and, in the end, that there can be constraints with respect to the local territory and the family of origin (Courgeau 1985; Sandefur and Scott 1981). Cohabitation, in contrast, is considered a transitory state for those with unstable economic positions (Oppenheimer 2003). In the US context, a large percentage of marriages starts at young ages with a premarital cohabitation and economic instability (Smock 2006). Marriage is desired by most cohabiters, which do not have the necessary economic stability (Cherlin 2004). For them the change of residence represents the opportunity to increase their income and to get married (Cherlin 2004). For these reasons, cohabitants have a greater propensity to change residence than married couples (Oppenheimer 2003).

The birth of a child can be a further stimulus to short-distance migration, in order to adjust the dwelling size to the family size (Clark et al. 1984; Courgeau 1985), or to move from a rented house to an owned house (Davies Withers 1998). However, scholars have also underlined the negative effect of parenthood in the case of long-distance migration, mostly depending on the housing market (Clark and Huang 2003). Overall, internal mobility decreases if the number of household members grows; in fact, this increase implies higher costs to changing one's house and a greater number of emotional and social bonds (Sandefur and Scott 1981) mostly with respect to long-distance migration (Kulu 2008).

Turning to demographic characteristics, particularly wide is the attention that scholars have given to the sex, age, and place of birth of migrants. Over time, the mobility of women has become increasingly similar in size to the mobility of males (Mckinnish 2008). However, female migrants still have lower wages and lower-level jobs (Cooke 2003) because, more often than men, they sacrifice their careers in favour of the family's interests (Baldridge et al. 2006; Clark and Withers 2002; Mckinnish 2008). Women have an equal or greater propensity to move than men, and they change residence at a younger age both in short- and long-distance flows (Mulder 1992; Mulder and Wagner 1993). The age profile of internal migrants is quite irregular; usually peaks of migration correspond to young adults ages, then the mobility's pattern tends to decrease with increasing age, but increases again in connection with retirement (Rogers and Castro 1981; Wilson 2014). However, even if the age profile of internal mobility has always had similar trends, we observe different intensities by country (Bernard et al. 2014). In addition, previous studies show that people who have already experienced a shift have a higher propensity to migrate (DaVanzo 1978; Herzog Jr. and Schlottmann 1984); similarly, those people born abroad mainly migrate because they are less linked to the territory (Belanger and Rogers 1992). In particular, foreign-born individuals with high level of education have the highest propensity to migrate, even if different results have been observed depending on the origin country (Bartel 1989).

Short-distance migrants may have different characteristics than long-distance ones. In Italy, a further distinction should be considered; in particular, the mobility from the south to the centre-north. In fact, Italy is characterized by a long-temporal dualistic socio-economic structure (D'Antonio and Margherita 2007; Piras 2005). There persist significant economic differences among Italian macro-areas, with northern regions more industrially and economically advanced than the southern ones; as a consequence, data underline the presence of historical significant south-north flows for labour reasons (Bubbico 2012). After the last economic crisis, which is currently impacting Italy, the economic gap between the north and the south has returned to have a central role (Laganà and Violante 2011) and its effects on internal mobility have attracted recent debates among scholars, with not always unanimous positions (Aina et al. 2015; Di Cintio and Grassi 2011; Pugliese 2011). In particular, migration from the south to the rest of the peninsula may have specific aspects of interest: unilateral trajectory from underdeveloped local areas to highly developed ones, which does not always occur when looking at interregional mobility (Bonifazi et al. 1999); migratory chains and migratory networks; workers coming from backward economic sectors (in the origin areas) and being occupied in penalized positions in the destination areas (Mencarini 1999); preservation of original lifestyles among migrants (Reyneri 1979). Of particular interest is the mobility of well-educated and qualified people from the south (D'Antonio and Margherita 2007; Piras 2005), with the consequent impoverishment of the areas that are losing their best human capital (Dotti et al. 2013; Meliciani and Radicchia 2014; Panichella 2014; Piras 2007). This increasing percentage of immigrants with high-level education among migrants is also linked to the decreasing propensity to move by less skilled people from the south (Bubbico 2014; Pugliese 2011). A third element in this picture is represented by individuals who move to the centre-north to achieve the best educational attainment but in order to find a qualified job in the south (Impicciatore and Tuorto 2011; Panichella 2009). According to such literature, studying the mobility between the south and the centre-north would require a separate analysis. However, in this paper we do not consider the origin and destination of the migration flows, mostly because of the small size of the observed cases, but also because we believe that the study of general mobility and the characteristics of migrant populations has its own specific value in the scientific debate. However, given the importance of the south-north gradient, we depict some specific analyses on this issue according to the available data.

4.4 Data and Methods

The main source used in this report is the European Union Labour Force Survey, conducted in Italy by ISTAT in 2014 (Italian Labour Force Survey, ILFS). This is a quarterly survey. We use the Italian annual average data by recalculating the weights used to make the sample representative of the observed universe[22]. The overall unweighted sample amounted to 604,580 individuals, of which 52.5% were women, and 8.6% were foreign-born. Among other things, the survey collected information about one or two years before the interview, and in particular the previous residence within this period. Thus, it allows us to individuate the presence of mobility events. However, we do not know exactly when the mobility took place, nor do we know whether this is an isolated migration or there have been other movements in the same period. In addition, the survey collected mobility information only for people in working age (older than 15 years), for this reason we decided to exclude from the analysis people at younger ages.

[22] ILFS data provide a specific procedure for the calculation of the weights in order to obtain the annual average. After replacing the weights in the four quarters with those specifically provided in the survey, the new weights thus obtained were divided by four.

The final sample for the purposes of our analyses is represented by 525,335 cases. We used weighted data and we decided to split this sample between non-migrants and migrants, as follows. ILFS data provide information about the residence one or two years before the interview, in addition to the current one. Thus, it considers short-period changes of residence only (a length of two-years). We defined as migrants those who changed their place of residence during this period and as non-migrants their counterparts (Reher and Silvestre 2011). According to this definition, internal migrants represent 1,180 (unweighted) cases. The largest part of them (620 unweighted cases) move between municipalities within the same province (short-distance migration). The medium- and long-distance migrants are 560 individuals (unweighted cases), of which 61.8% are interregional flows. Migrants from the south to the rest of Italy are 8.7% of the total level of internal mobility (79 unweighted cases).

We restricted our analyses to the medium- and long-distance migrants (560 cases). This decision was made because we are interested in looking at the relationships between mobility and demographic, household, and employment characteristics introduced in the theoretical background section. According to the literature, long- and medium-distance migrations are mostly related to the search for a job or to family patterns (Kulu and Billari 2004; Schachter 2001), while mobility inside the province is mainly housing-related (Schachter 2001). Moreover, we also divided the sample between people born in Italy and born abroad. We used the place of birth because it is widely used in the international literature (Reher and Silvestre 2009; Rogers and Raymer 1999) and because internal migrants by nationality were few and less representative in ILFS data. In the analyses included in this contribution, we use a cross-section perspective in analysing the characteristics of migrants compared to non-migrants. This approach allows us to analyse the main determinants, at the time of the interview, of the propensity to have changed residence in the two last observed years, even if the cause-effect relation is not always well defined.

In the next section we show descriptive results of the ILFS data analysis. In particular, depicting our analyses between migrants and non-migrants, we compare their main demographic characteristics, their household characteristics, couple relationship, and their socio-economic conditions. People born abroad are considered also in comparison to natives. After that, the multivariate analysis includes a set of logistic models in order to control for compositional effects and to analyse the main determinants of mobility. As for the dependent variable, we consider the above-mentioned sub-group of migrants in comparison to their counterparts. We run four different models according to different sub-groups, namely: women; only employed people; people aged 25- 34; people born abroad. The analyses of different sub-samples can shed light on their peculiar characteristics in comparison to the full-sample model that consider jointly all respondents aged 15 and more.

According to the theoretical background described so far and the available data, three sets of covariates are included in the models. Three variables refer to the demographic characteristics of respondents, namely: gender, age and area of birth. Three additional variables consider selected socio-economic conditions and the area of settlement: educational level, employment condition and position, macro-area of residence. In the end, the last variable includes in the analyses the interrelation between couple formation and parenthood. In particular we distinguish among informal unions (or people in cohabitation), formal unions (or married people), and previous unions (single parent, divorced or separated de facto or de iure people) considering the presence or absence of at least one child within the family nucleus.

4.5 Descriptive Analysis of Internal Mobility in Italy

ILFS data allowed us to investigate the demographic and socio-economic characteristics of internal migrants in Italy. Table 1 shows that the large number of women among migrants is particularly evident in the group of people born abroad (62.7 men for each 100 women). Half of non-Italian migrants are aged under 35 and only 10.5% of them are in the oldest age group; non-migrants have a different profile among immigrants, with 50.3% in the middle age class and 14.3% aged over 54. The picture of the natives suggests similar profiles, even at a less evident level. Migrants are to a larger extent women and under 35 than their counterparts (83.8 men for each 100 women and 40% are aged under 35). In contrast, Italian non-migrants assume a rough gender balance (94 males for each 100 females) and have the lowest quota in the age class 15-34 (23.5%). Generally speaking, the results of the analyses suggest that migrants are primarily young and women, especially if they were born abroad.

Table 1 Age groups and sex-ratios by place of birth and mobility status. Percentages.

Age groups	Mobility status and place of birth					
	Movers			Non-movers		
	Born in Italy	Born abroad	Total residents	Born in Italy	Born abroad	Total residents
15-34	40.0	50.2	41.7	23.6	35.4	24.8
35-54	36.9	39.3	37.3	34.3	50.3	35.9
> 54	23.1	10.5	21.0	42.1	14.3	39.3
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
% sex ratio	83.8	62.7	80.0	94.0	82.2	92.7

Source: our elaboration on Eu-lfs, 2014.

In Table 2, where we show the distribution of individuals by type of couple relationship and type of household, the most significant differences concern migrants and non-migrants. Internal migrants have a lower percentage of formal unions compared to their counterparts; the lower propensity to move of conjugates is therefore confirmed (Boyle et al. 1999). However, the older age of non-migrants (see Table 1) affects, within this group, the quota of both married people and of individuals who have been in a previous union. The multivariate analyses reported in the next section will disentangle such compositional effects. According to the data on the place of birth, migrants born abroad have a higher percentage of individuals who have been in a previous union (23.6%) while natives have a higher percentage of cohabitations (30.9%). This result evidences that these subgroups have different household characteristics with respect to mobility, and it is interesting if we consider that foreign-born individuals are in general younger than natives (Table 1) and single.

Table 2 also shows the percentage of marriages that have been celebrated since 2012. The presence of a higher quota of marriages among migrants than among non-migrants should suggest a direct link between the mobility event and the event of getting married. The results support this issue, as the percentage of marriages since 2012 for migrants is 18.7% as opposed to 2.8% for non-migrants. Considering the whole individual marriage period, the results are strengthened by the fact that for migrants the highest percentage of marriages took place in 2013 (9.7%) and in 2012 (5.7%), while for non-migrants marriages took place rather uniformly over the whole considered period (from 2000 to 2010 the percentages were between 1.9% and 2.2%). Looking at the place of birth, the same quota rises to 30% among immigrant migrants and shows an even stronger link between the mobility event and the event of getting married.

Table 2 Married since 2012 and childless people and individuals by type of union and of household, by place of birth and mobility status. Percentages.

Individuals	Mobility status and place of birth					
	Movers			Non-movers		
	Born in Italy	Born abroad	Total residents	Born in Italy	Born abroad	Total residents
			Type of union			
Never in union	11.4	12.8	11.7	6.6	11.2	7.0
Informal union	30.9	22.2	29.5	19.7	16.3	19.4
Formal union	41.9	41.4	41.8	52.4	50.9	52.3
Previous union	15.8	23.6	17.0	21.3	21.6	21.3
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
			Type of household			
Mono-nuclear hh	19.7	26.3	20.8	18.6	24.0	19.1
Couple with children	39.5	27.7	37.5	50.8	52.2	51.0
Couple without children	33.3	35.9	33.8	21.3	15.0	20.7
Mono-parental hh	7.5	10.1	7.9	9.3	8.8	9.2
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
% married p. since 2012	16.4	30.0	18.7	2.4	5.5	2.8
% childless people	53.1	62.2	54.6	39.9	39.0	39.8

Source: our elaboration on Eu-lfs, 2014.

It appears that the most significant variable to influence mobility is the presence (or absence) of one's own children. Table 2 shows that on average childless migrants make up the majority (54.6%); among immigrants the percentage is still higher (62.2%). Childless immigrant and native non-migrants, instead, have lower percentages than migrants (39% and 39.9% respectively). In fact, scholars have shown that the presence of children can be a barrier to migration, especially in the case of long-distance migration (Kulu 2008; Sandefur and Scott 1981). Looking at the type of household, important differences emerge between Italians and immigrants. In this case, we considered married and cohabiting couples jointly. Among native migrants, couples represented the 72.8% (among which 39.5% have children). The picture of immigrant migrants is more heterogeneous, with a significant quota being mono-nuclear households (26.3%) and single parent households (10.1%). Among non-migrants, those born abroad had a higher proportion of couples with children compared to Italians (52.2% and 50.8% respectively). The second highest percentage is mono-nuclear households among immigrants (24%) and couples without children among autochthonous (21.3%).

Table 3 allows to shed deeper light on the study of internal mobility, crossing demographic characteristics with employment, income, and educational attainment. We divided employed people into three categories: the most qualified ones (legislators, chief executives, business owners, managers, intellectual, scientific and highly specialized jobs) are at the high level; the less qualified ones (unskilled workers, drivers) are at the low level; everyone else is at the medium level. Migrants have a higher percentage of people working in high-level jobs than their counterparts (18.1% and 7.1% respectively), and a higher percentage of people searching for a job (11.8% and 6.1% respectively). Such percentages suggest, on average, a larger propensity for migrants to change their employment profile than non-migrants. In addition, migrants have lower inactive quota than non-migrants (36.8% and 51.1% respectively). As a result, incomes are on average higher for migrants (about one out of three earn over 1,500 euros per month) while the percentage drops to 25% for non-migrants. The level of education is higher for those who have changed their residence: 34.7% are graduates and 23.6% have a low education. By contrast, we observe a lower educational level among non-migrants (51.8% have compulsory level of education).

Table 3 Socio-economic characteristics by sex, age, place of birth and mobility status. Percentages.

Variables	Modalities	Non-movers	Movers							
			Total movers	Sex		Age			Place of birth	
				Males	Females	15-34	35-54	>54	Italy	Abroad
Employment condition	Inactive	51.1	36.8	31.5	41.0	34.0	20.8	70.6	37.5	33.3
	Searching for a job	6.1	11.8	10.8	12.6	13.5	13.3	5.4	10.7	17.2
	Low	8.1	5.8	5.1	6.4	6.0	7.8	2.0	4.5	12.4
	Medium	27.6	27.5	34.0	22.3	33.6	34.9	2.4	26.2	34.1
	High	7.1	18.1	18.6	17.7	12.9	23.2	19.6	21.1	3.0
	Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Employment position	Dependent	77.0	73.4	67.2	79.6	79.0	73.7	48.5	72.4	79.0
	Autonomous	23.0	26.6	32.8	20.4	21.0	26.3	51.5	27.6	21.0
	Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Educational level	Compulsory	51.8	23.5	24.2	23.0	12.2	23.8	45.8	24.2	20.3
	High school	35.5	41.8	43.1	40.7	47.5	43.0	28.1	37.5	63.3
	Degree	12.7	34.7	32.7	36.3	40.3	33.2	26.1	38.3	16.4
	Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Income	< 1000	25.3	21.3	10.6	31.0	23.7	20.1	13.4	15.3	51.6
	1000-1500	49.7	49.0	45.6	52.1	42.9	58.5	25.0	51.1	38.5
	> 1500	25.0	29.7	43.8	16.9	33.4	21.4	61.6	33.6	9.9
	Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Source: our elaboration on Eu-lfs, 2014.

Turning to the gender characteristics of migrants, men and women show very similar profiles with respect to all variables. However, two differences with respect to their percentages are worthy of note: firstly inactive women are 41% while men are 31.5%; on the one hand this happens because of the older female age structure, on the other because of the prevalence of women homemakers (Baldridge et al. 2006; Clark and Withers 2002). Secondly, although women have on average an education similar to that of men, or even better, they have lower incomes, only 16.9% of them earn more than 1,500 euros per month; instead, the percentage for males rises to 43.8%. It seems to confirm that Italy is still far from the realization of gender equality in terms of employment conditions, as recent studies appear to confirm (Pilato 2011).

The study of the characteristics by age group shows important heterogeneity. The individuals aged over 54, despite having a lower education than the others, are migrants with high income (61.6% declare an income higher than 1,500 euros per month) and with high employment condition (19.6%). In addition, the percentage of inactive (or retired) persons is also very high among them (70.6%). These values seem to support the contention of the literature: the elderly who migrate are mostly seeking to move to wealthy regions or provinces where one can lead a pleasant life, or are inactive people who are reaching out to their families (Mulder 1993; Rogers and Castro 1981). Migrants aged under 35 have better condition than those who do not change their residence: higher educational level (40.3% compared to 12.7% have a degree), higher employment level (46.5% compared to 34.7% have a medium-high level employment) and higher income (33.4% compared to 25% earn more than 1,500 euros per month).

Still greater are the differences by place of birth. The percentage of born-abroad graduates is lower than the one of native graduates (16.4% and 38.3% respectively). Non-Italian people are mostly concentrated in high-school level education (63.3%) and have the worst employment conditions: only 3.1% of them have a high level of employment, while for Italians the percentage is 21.1%. The quota of non-Italian people searching for a job is 6.5% percentage points higher than for Italians. Even their income is on average much lower than that of natives. Half of them earn less than 1,000 euros per month, and only 9.9% of them earn more than 1,500; conversely, 38.3% of natives make on average more than 1,500 euros per month and only 15.3% of them earn less than 1,000 euros.

As previously shown, ILFS data contain some information concerning one or two years before the survey (the same period length of observed mobility). To explore the changes in the economic status of migrants and non-migrants, we compared people's previous employment conditions with their current one (Table 4). Those who moved show, again, a more dynamic employment profile compared to non-migrants. They have a quota of success, as described by Ahmed and Slrageldin (1994), moving from the status of searching for a job to the status of being employed (7.3% of migrants compared to 2.2% of non-migrants), and from the status of being inactive to the status of being employed (3.3% of migrants compared to 0.9% of non-migrants). In addition, the proportion of inactives over-time is smaller among migrants than non-migrants (28.3% and 44.9% respectively). But migrants have also cases of lack of success, as quoted by Geist and McManus (2008), moving from the status of being employed to the status of searching for a job (3.8% of migrants compared to 1% of non-migrants).

Table 4 Previous and current employment condition by mobility status. Percentages.

Mobility status	Employment condition	Current professional status				% change of status
		Employed	Searching for a job	Inactive	*Total*	
Movers	Employed	40.9	3.8	1.5	*46.2*	5.3
	Searching for a job	7.3	6.5	7.0	*20.8*	14.4
	Inactive	3.2	1.5	28.3	*33.0*	4.7
	Total	*51.4*	*11.8*	*36.8*	*100.0*	
Non movers	Employed	39.7	1.0	1.4	*42.1*	2.4
	Searching for a job	2.2	4.2	4.8	*11.2*	7.0
	Inactive	0.9	0.9	44.9	*46.7*	1.8
	Total	*42.8*	*6.1*	*51.1*	*100.0*	

Source: our elaboration on Eu-lfs, 2014.

4.6 Multivariate Analysis

Looking at the multivariate analysis in Table 5, we included in the first model all the respondents of working age. According to the trend described in section 2 and further discussed below, no significant difference emerges by sex (see Figure 2). In contrast, the variable about age shows a statistically significant ∩-shape trend and a peak at 25-34 years old (the referent group). Diving deeper into the descriptive results (see Table 3), this shows that being a young adult increases the propensity for internal mobility when also controlling for other characteristics.

Another interesting result concerns the area of birth. All the groups born abroad show a higher propensity for mobility than the majority group (all the odds are higher than 1), but at different levels: people born in Africa and Asia have the highest odds (2.41 and 1.81 respectively) while Europeans show no significant differences in comparison with the reference group. Even though our data do not support further analysis, such results somehow outline the presence of important differences in mobility among ethnic groups.

Considering the educational and employment characteristics[23], we notice the highest propensity to move among people with the highest levels of education and employment (the odds being equal to 3.50 and 1.28 respectively) and those who are searching for a job (1.82). Such results, confirming the descriptive ones in Table 3, outline the presence of at least two different models of internal mobility: on the one hand, people who move to invest their high human capital and to improve their economic conditions; on the other, people who move to find new employment and life opportunities. The area of residence shows how the central and northern regions have become the main destinations for such mobility-based projects (the odds being equal to 1.96 and 1.74 respectively). However, such analyses do not provide information about the origins of the migrants and do not separate south-north migrations from the others of medium-long distances.

The variable about the interrelation of couple formation and parenthood provides additional elements of discussion. With respect to the interviewees who have never been in a couple, parenthood affects negatively the propensity to move, whatever the actual couple relationship is (formal, informal, or previous)[24]. By contrast, cohabitation with no children carries the highest risk of mobility (4.08). Also, married (with no children), mono-nuclear and never married people showed no statistical difference in their propensity to move.

Looking at four different sub-samples, we aim to analyse those variables whose effect is strengthened with respect to the propensity to move. As to the women sub-sample and according to the previous results, we observe no significant differences in the comparison of the values of the odds of the full model, including all the respondents of working age. Educational level and area of residence represent the only notable exceptions. Medium and high educational level and residence in the north-central area are associated with higher odds-values among women than in the full model. In other words, the higher the human capital of women the higher their propensity to move, and this is even more evident than among their male counterparts.

Restricting our analysis to employed people, the first important result concerns people born abroad, who have a positive odds-value (1.75) compared to the majority group, confirming their high mobility when it comes to finding a job opportunity. At the same time, employed people with a high educational level and in a union without children have the further propensity to move (the odds, respectively, being equal to 1.76 with respect to high education and 4.37 and 1.77 with respect to informal and formal union with no children). In addition, the variable about the job-position evidences how the autonomous employees have a higher propensity to move than dependent ones (1.45).

In analysing the sub-group of young adults, those who are searching for a job have a lower (even positive) propensity to move compared to the full sample (1.44 compared to 1.82). The same is true among young adults with university degree: their odds (2.79) are lower than the odds of the whole sample (3.50). Such results indicate their lower propensity to take advantage of the opportunity to move to find new job opportunities, presumably because of the opportunity they have to live with their original family. In fact, once they live as part of a couple (forming a new formal family nucleus without children), their propensity to move is higher with respect to the other age groups (odds equal to 1.63).

[23] We exclude from the analyses the information about the average income per month, because of its strong collinearity with the employment condition.

[24] Other results, not shown here, outline that even mono-parental households assume a negative value in the propensity for mobility compared to mono-nuclear households. This additional material is available on request and has not been subjected to formal or substantive review, either by the editorial board or by the external reviewers.

Table 5 Determinants of internal mobility by different sub-groups. Logistic regression models.

Variables	Modalities	All respondents		Women		Workers		Aged 25-34		Born abroad	
		Od.R	p-val	Od.R	p-val	Od.R	p-val	Od.R	p-val	Od.R	p-val
Gender	Man	1		---		1		1		1	
	Woman	1.07		---		1.13		0.90		1.07	
Age	15-24	0.64	**	0.80		0.96		---		1.48	***
	25-34	1		1		1		---		1	
	35-54	0.48	***	0.50	***	0.46	***			0.53	***
	55+	0.23	***	0.27	***	0.24	***			0.39	***
Area of birth	Italy	1		---		---		---		---	
	Europe of European Union (EU)	1.06		---		---		---		---	
	Europe non EU	1.34		---		---		---		---	
	Africa	2.41	**	---		---		---		---	
	Asia	1.81	***	---		---		---		---	
	America and Oceania	1.43	*	---		---		---		---	
Born in Italy	Yes	---		1		1		1		---	
	No	---		1.39	**	1.75	***	1.00		---	
Employment condition	Inactive	1		1		---		1		1	
	Searching for a job	1.82	***	1.68	***			1.44		1.68	*
	Low	0.76		0.87		1		0.82		1.01	
	Medium	0.66	***	0.62	***	0.87		0.58	**	0.91	
	High	1.28	**	1.27	**	1.76	**	0.87		1.03	
Employment position	Dependent	---		---		1		---		---	
	Autonomous	---		---		1.45	***	---		---	
Educational level	Compulsory	1		1		1		1		1	
	High school	2.29	***	2.58	***	1.78	***	1.33		2.27	***
	Degree	3.50	***	3.91	***	2.73	***	2.79	***	1.80	
Residence area	North	1.74	***	1.93	***	1.29		2.05	***	1.51	
	Center	1.96	***	2.32	***	1.12		1.13		1.38	
	South	1		1		1		1		1	
Interrelation between couple formation and parenthood	Never in union	1		1							
	NO CHILD: informal union	4.08	***	3.83	***	4.37	***	3.86	***	3.69	***
	NO CHILD: formal union	1.33		1.33		1.77	**	1.63	**	1.50	
	NO CHILD: previous union	1.35		1.23		1.57		1.33		1.29	
	CHILDREN: informal union	0.43	***	0.46	***	0.81		0.34	***	0.26	***
	CHILDREN: formal union	0.61	***	0.59	**	0.73		0.65		0.51	*
	CHILDREN: previous union	0.42	***	0.40	***	0.51	*	0.48	**	0.35	*
Constant term		0.00	***	0.00	***	0.00	***	0.00	***	0.00	***
pseudo R2		0.07		0.07		0.06		0.07		0.05	
Number of observations (unweighted cases)		525,335		278,792		203,719		52,746		48,906	
Number of mobility cases (unweighted cases)		560		314		265		145		72	

Sig.: *p-value < .1; **p-value < .05; ***p-value < .01.
Source: our elaboration on Eu-lfs, 2014.

The presence of few observed cases of internal migrants may affect the model about the foreign-born sub-group. Scholars worry about the use of conventional logistic regressions for data in which there are a small number of cases on the rarer of the two outcomes (King and Zeng 2001). With respect to this issue, we ran alternative logistic models (not shown here) that give a lower mean square error in the presence of rare events data for coefficients[25]. However, we found no significant differences compared to the classical logistic regression outcome and thus we decided not to include them in the analyses. Again, we compared the odds values of the model restricted to people born abroad with the ones of the full model and underlined two main outcomes. The propensity to move among immigrants is positively related to the youngest ages (immigrants aged 15-24 have an odds ratio equal to 1.48 compared to the reference one) and to the secondary school level (immigrants with a middle educational level have an odds ratio equal to 2.27 compared to the reference one). Interestingly, parenthood has a very negative impact on the propensity to move (0.26), regardless of what the actual union situation is.

A specific sub-sample of analyses (not shown here) concerned migrants from the southern area to the northern-central ones. Generally speaking, we do not observe different patterns compared to the general

[25] The maximum likelihood estimation of the logistic model is well known to suffer from small-sample bias. The degree of bias is strongly dependent on the number of cases in the less frequent of the two categories. King and Zeng (2001) accurately described the problem and proposed an appropriate solution applying penalized likelihood to logistic regression in order to reduce the small-sample bias in maximum likelihood estimation.

model (first model). Also, with respect to this specific kind of migration, no significant differences emerge based on sex and age, that show a statistically significant ∩-shape trend (as observed in the first model). In addition, the other covariates also assume the same meanings as the ones in the first model, confirming the results shown above. The highest propensity to move from the south to the centre-north of Italy is among highly educated people (the odds being equal to 4.47) and those who are searching for a job (odds: 2.31). Parenthood has an even more negative effect (than the general model) on the propensity to move, irrespective of what the actual union situation is (the odds being equal to 0.09 in the category parenthood in informal union; the odds being 0.32 in a formal union; and the odds being 0.07 for a previous union). In the end, people in an informal union with no children assume a positive risk of mobility (odd: 3.61).

4.7 Conclusion

The analyses reported above provide further elements for discussion in the study of the geographical re-distribution of the resident population. In particular, using a cross-section perspective, ILFS data allow us to deepen the general knowledge of this phenomenon in Italy, where the lack of ad hoc sample surveys had previously limited the analysis. The collected information allows us to consider at least three central individual aspects related to socio-economic, household, and demographic characteristics. All of them represent significant drivers in understanding and characterizing Italian internal mobility. Moreover, the analyses also consider them jointly, providing further results and outing specific patterns.

The migration that occurs for economic and occupational reasons represents a still significant south-north gradient in reshaping the Italian demographic background. The northern and central regions continue to be the most dynamic ones in term of residential mobility, and the southern regions continue to be affected by long-distance outward migration. Well-educated and qualified people, in particular with an autonomous occupation, have the highest propensity to be included among migrants; also, people that migrate have a positive and dynamic employment profile compared to non-migrants. Thus, migration continues to be strongly linked to the attempt to invest human capital and to improve economic conditions. Inactive and unemployed people who move in order to find employment represent another part of the story. This group, in particular among women and international migrants especially at young ages, reshape, through their migration, their economic conditions and income level by searching for more dynamic labour-market contexts. Inactive adults with relatively low education and income, as indicated by socio-economic characteristics, represent the third group. Migration should represent among them a way to find better life opportunities.

Looking at the household characteristics, our analyses show how parenthood negatively affects inter-province mobility. This result is robust and does not change when we look at the different types of couple formation, in particular mono-parental households, and the different sub-groups, in particular people born abroad. Once we control for the presence of children in the household, the differences in the propensity to move between mono-nuclear households and childless married couples are not yet significant. People in an informal union with no children have the highest propensity to move. This result confirms the picture described by scholars, which explains the greater mobility of people in informal unions by reference to their greater social dynamism and economic instability (Courgeau 1985; Oppenheimer 2003). Moreover, in the presence of weak family ties (absence of children), migration represents a way to find new life and socio-economic opportunities.

The demographic characteristics we analysed provide further confirmation of the outcomes reported in the scholarly literature. The analyses do not show significant differences by sex, confirming the general convergence between the two migration patterns. However, educated women (and presumably women who are career-oriented) have higher propensity to move than their counterparts. People that are foreign-born, are mostly searching for a job, and have secondary level education, have a higher propensity to move than natives. Such results show how the international migration presence in Italy is still characterized to a large extent by adults that arrive and move within Italy for work-related reasons. Thus, the increased presence of immigrants in the Italian redistribution phenomenon is mainly due not to their increasing propensity to move, but rather to the increasing amount of foreign residents. Africans exceed the other ethnic groups in their mobility experience. In addition, immigrants at very young ages (15-24) have a higher propensity to move within Italy than their native peers and older immigrants. Among these two former sub-groups (Africans and youths) the economic and employment reasons and the absence of territorial ties mostly prevail on finding residential stability. However, the increase in family reunifications is changing this picture; looking at the internal migration trends within the foreign-born population, in the most recent years, we observe similar incident rates to natives (Bonifazi et al. 2012).

Age also represents an important discriminant in parsing Italian mobility. In the results of our analyses, we found a ∩-shaped trend that peaks at 25-34 years old. We had no way to also fully analyse the increased migration in connection with retirement, which has been documented by scholars. These results reflect the different phases of the life course. Young adults live in the origin family and experience the mobility event in relation to their own family formation, occupation, and new life opportunities. The possibility to change residence decrease during middle-adult ages because the increase in constrains: stable job positions, housing properties, parenthood, and family ties (Wilson 2014). When people are elderly and around the age of retirement, individuals (likely free from family related and occupational constraints) have new chances to migrate in order to find better life conditions.

In synthesis, our cross-sectional analyses show that the differential characteristics of migrants in comparison to the dominant non-migrant group are partially explained by compositional factors, such as socio-economic, household, and demographic characteristics. This evidence indicates that a selection process operates with respect to the Italian geographical re-distribution of the population, and that mobility events should be included in the analyses of Italian social changes and territorial differentials. Further analysis can consider how the selection hypothesis has changed in recent years and in particular how the last Italian economic crisis has changed internal mobility and the characteristics of migrants.

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CONCLUSION

The choice to proceed from the geographically superior administrative level (migration between Macroregions) to the lowest (migration between municipalities) allowed us to reveal crucial aspects of continuity and discontinuity in the analysis of different types of internal migration.

The most evident result was the difference in internal migration patterns between the Centre-north and South, as already established by previous research. In particular, the application of the multiregional life table using the place of birth-dependent approach (chapter 2) has provided interesting insights. Through this model, we studied migration between four Italian Macroregions (Northwest, Northeast, Centre and South) from 2002 to 2014 separately by sex and age. The data on migrants born in the South (the poorest Macroregion of the Peninsula) shows that migration occurs mainly for economic and occupational reasons. Individuals leaving the South are mainly men of working-age. However, the male prevalence of "born in the South" among migrants decreased over time. On the contrary, in recent years, more women born in the South internally migrated toward the Central regions than men. The migration between Macroregions of people born in the North also is predominantly female (both in the Northeast and in the Northwest). Individuals born in the Northeast have the lowest density of migratory flows directed toward the South compared to the other Macroregions. Their migratory flows are strongly concentrated toward the Northwest. This concentration of migratory flows suggests that distance plays an important role for them (an assumption that we verified in a later section). Migrants born in the Northwest and born in the Centre are characterised by an intermediate level of migratory flows. Individuals born in the Centre, however, distinguish themselves by the greater gender balance among those born in all Italian Macroregions. The temporary life expectancy allowed us to observe the differences between men and women for each age class (0-19, 20-39, 40-59, 60 and older) and the years of life expectancy lived in each Italian Macroregion. The obtained results confirm that the higher levels of internal migration are concentrated during the age of employment for those born in the South than for those born in the other Macroregions. For all birth cohorts a similar trend of migration over time emerged. Although the migratory flows decreased between 2005 and 2010, they reached the highest values recorded throughout the periods considered for each Macroregion in three of the last four years of the dataset (2011-2013).

In chapter 3, we studied interregional Italian migration. In this case, by using the gravity model, we analysed Italian internal migration in 2014 focusing, also in this case, on the place of birth of migrants (those born in each of the twenty Italian regions and those born abroad). The inclusion of place of birth allowed us to answer most of the unanswered questions in the previous chapters as well as to investigate new aspects of the phenomenon. In particular, we confirmed that those born in the regions of the Northeast have less propensity to cover long distances when they migrate. In most cases, they move towards the closest regions of the Northeast. When they leave the Northeast, they mainly chose the regions of the Northwest and some regions of the Centre (Tuscany and Lazio in particular) as their destinations. They rarely chose the Southern regions as a migration destination. On the other hand, those born in Southern regions have the highest density of migratory flows. The gravity model highlighted the central role of the regions' geographical location. The migrants born in the southernmost regions are those who cover longer distances. Clearly, for those born in the Northern regions, who, as already described, have a lower tendency to move toward the South, the propensity to cover long distances is particularly low. Another crucial finding from the model is the role played by GDP per capita. As GDP in the destination region increases, the propensity to migrate to all regions of birth also increases. The opposite effect takes place when the GDP increases in the region of origin of the migratory flow. The explanatory variable "GDP" has a stronger effect when we examine the population by place of birth (instead of using only the total resident population). A new finding highlighted by the analysis is the different migratory patterns between individuals born abroad and those born in an Italian region. For those born abroad, distances play a smaller role in reducing the risk of migrating than for those born in the Centre-north regions (with the exception of migrants born in Lombardia, Piemonte and Emilia Romagna). The opposite happens if we compare individuals born abroad with individuals born in the Southern regions (except Abruzzo and Molise). Finally, through this model, we found that for individuals born in Valle d'Aosta, Molise and Basilicata (compared to the others), it is more important to meet residents with their same place of birth in the region of destination. The reverse is true for those born in regions with high interregional migration flows, in particular, migrants born in Sicilia, Campania and Lazio. The lowest negative coefficient is obtained for those born abroad.

The last section of the thesis (chapter 4), in line with the chosen approach in this thesis, proceeded from a more general analytical level (migration between Italian Macroregions) to a more specific analytical level (migration between Italian municipalities). In this case, we studied migrations between municipalities in 2014 using a micro-level approach (through multivariate analysis). In other words, using the data for Italy provided through the European labour force survey (ILFS), we analysed how the demographic (sex, age and place of birth), socio-economic (specifically employment, income, education, area of residence) and household characteristics (such as household and type of relationship and parenthood) influence the internal migration in Italy. In addition, we also used the variable "place of birth" in this chapter. Yet, with the ILFS data, we were not able to distinguish between individuals born in each Italian municipality. Consequently, in this chapter the variable "place of birth" was only used to distinguish between those born in Italy and those born abroad. The obtained results reinforced the findings outlined above, although they added important elements to the analysis. The growing importance of internal migrants born abroad in the process of redistributing the population emerged as a crucial finding. Migrants born in Africa and in Asia have a greater propensity to migrate. Migrants born abroad who have a lower level of education have the highest propensity to migrate. At the same time, their propensity to migrate is particularly low when they have children. In contrast, for those born in Italy, the age profile of internal migration presents a ∩-shape trend that peaks at 25-34 years. The propensity to migrate is notably high among those who have graduated from middle or high school. In general, changes in residence continue to be strongly linked to an individual's effort to improve his or her economic and occupational position, independent from whether they are born in Italy or born abroad. Highly-educated women, presumably oriented toward a professional career, have a higher propensity to migrate than their male counterparts. People in an unregistered relationship with no children have the highest propensity to migrate. Yet, even for married couples, the absence of children increases their likelihood to move to a new place of residence. Finally, the analysis was also repeated with respect to the internal migration of individuals from the South to the Centre-north. In essence, the above-described outcomes were confirmed. The highest propensity to move from the South to the Centre-north of Italy was found among highly-educated people and those who were searching for a job. Parenthood has a more negative effect (than in the general model) on the propensity to move.

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