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PART II

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INTER-PROVINCIAL MIGRATION IN ITALY: A COMPARISON BETWEEN ITALIANS AND FOREIGNERS

Abstract. Internal migration in Italy increased in the 2000s due to foreigners residing in the country. Foreigners have changed the characteristics of Italy's internal migration. Extended gravity models were run to highlight the differences between the migratory behaviours of Italians and foreigners. The model was implemented to detect the different effects of the Italian and foreign populations, and the distances between the provinces of origin and destinations of the inter-provincial migration of Italians and foreigners. Estimations obtained for the years 1995, 2000, 2005, 2010, and 2015 highlight the different evolutions of the phenomenon.
Key words: Internal migration; foreign population; gravity model; Italy.

1. INTRODUCTION

The analysis of internal migration is an important field of study and allows us to understand the mechanisms underlying territorial differences (Adey, 2009; De Santis, 2010a; Rees *et al.*, 2017; Kulu *et al.*, 2018). Internal migration is an es-

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sential component in the process of population redistribution (Long, 1985; Rees *et al.*, 2017), especially in countries such as Italy where the natural dynamics is very limited (Bonifazi, 1999).

From the 1950s to the early 1970s internal migration was an important factor in the remarkable redistribution of the Italian population (Golini, 1974; Bonaguidi, 1985; Livi Bacci *et al.*, 1996; Mencarini, 1999). From the 1980s to the early 1990s Italy changed from an emigration to an immigration country (Natale and Strozza, 1997; Bonifazi, 1998, 2007, 2013; Pugliese, 2006; Strozza and De Santis, 2017). Since the second half of the 1990s, internal migration has been on the increase and, as a consequence, the interest in this topic has arisen (Piras and Melis, 2007; Golini and Reynaud, 2010; Bonifazi *et al.*, 2012; Lamonica and Zagaglia, 2013; Colucci and Gallo, 2014, 2015, 2016).

The recent internal migration trend has been considerably affected by the increasing presence of foreign citizens, given their greater propensity to move within the country, and structural factors such as a greater incidence of foreigners within younger age groups (Casacchia *et al.*, 2010a; de Filippo and Strozza, 2011; Impicciatore and Strozza, 2016b).

International studies regarding the internal migration of foreigners, and specifically ethnic minorities, were developed at the end of 1990s, in both the United States (Kritz and Nogle, 1994; Frey, 1995; Alba and Nee, 1997) and Europe (Peach, 1996; Kritz and Gurak, 2001). Some studies investigated the relationship between the internal migration of foreigners and the internal migration of natives. The results of these studies show that the presence of large foreign communities can be both a trigger for out-migration for natives and a barrier to in-migration (White and Hunter, 1993; Frey, 1995; Kritz and Gurak, 2001).

It is thus important to verify and possibly quantify how the size of the Italian and foreign populations in the provinces of origin and destination affects the inter-provincial migratory flows of both Italians and foreigners. This can have potential policy implications. The push or pull role of some geographical areas could be useful to policymakers when adopting public policies aimed at increasing the attractiveness of an area, or at least the ability to retain the population of disadvantaged areas.

The main aim of this paper is to contribute to a better understanding of internal migration patterns during high-level periods of foreign immigration. We will study the changes in residence among the Italian provinces from 1995 to 2015 in order to identify the effects of the presence of foreigners[1] on internal migration. Italy is an

[1] A *foreigner* is any person who is not an Italian citizen, including stateless people. Italian citizenship is based upon the principle of *ius sanguinis*, meaning that the word '*foreigner*' also includes those who are not immigrants (because they were born in Italy) but whose parents both have foreign citizenships. At the same time, the word '*Italian*' also includes those who have immigrated from abroad but have acquired Italian citizenship by naturalization, marriage or other means according to national legislation (ISTAT, 2012).

extremely significant case since it became one of the main European destinations for international migration during this period (Sobotka, 2009; Strozza, 2010).

There are two main research questions. Firstly, we want to evaluate the importance of Italian and foreign populations for the internal migration of foreigners. When focusing on foreigners, we aim to evaluate in particular whether the changes in residence between provinces are linked to a process of spatial assimilation or to the attractiveness of migration networks. In the former case, the role of the Italian resident population is likely to be more relevant, with foreigners relocating to areas with better amenities and becoming closer to the territorial distribution of natives (Wright *et al.*, 2005). In the latter, the main emphasis lies on the role of the social network, where foreigners tend to move mainly to places where the presence of foreign communities is already significant (Massey, 1988; Finney and Simpson, 2008). In the second research question, we focus on the internal migration of Italians and its connection to foreign populations. The literature in the U.S. has paid attention to the relationship between internal migration and immigration from abroad (e.g. Frey, 1996; Card, 2001; Borjas, 2006; Ellis, 2012). Some evidence shows that nationals tend to move from areas that are destinations for foreigners (White and Hunter, 1993; Van Ham and Feijten, 2008). In Europe, empirical evidence is more limited. In Italy, Brücker *et al.* (2011) found a relevant relationship between foreign immigration and the interregional migration of nationals. We want to verify possible relationships between Italian flows and foreign populations.

We apply the gravity model in order to answer both research questions, where the dependent variable is the inter-provincial migratory flow of Italians and foreigners and the explanatory variables are the populations of origin and the populations of destination (as masses) and the distance between the place of origin and destination (Andersson, 2012; Beine *et al.*, 2015; Poot *et al.*, 2016). In comparison with previous studies reported in the literature, we also consider the role of the Italian and foreign masses (the populations in the origin and destination provinces) with regard to the internal migration of both Italians and foreigners. We consider socio-economic variables to inset the regional development of origin and destination provinces in the model. We include the unemployment rate and the percentage of highly educated adults as explanatory variables to account for socio-economic conditions. These can play a role in the increase or decrease of migratory flows (Biagi *et al.*, 2011; Piras, 2012; Wajdi *et al.*, 2017). We consider two dummy variables to account for geographical conditions (Lewer and Van de Berg, 2008). These restore the cross-sectional independence of the residuals (Bertoli and Moraga, 2015).

Focusing on the first research question, we assume that the effects of these explanatory variables might be connected to the attractiveness of ethnic and migration networks or, conversely, to a process of spatial assimilation. With regard to the second question, we consider the effects of foreign populations on Italian internal migration through the use of different masses. A unique simultaneous model for Italians and foreigners is specified, allowing us to assess the significance and level of differential effects. This gravity model allows us to contribute to the international debate on the demographic and geographical factors driving the internal migration of nationals and foreigners.

The paper is organised as follows. Section 2 narrows down the review to focus on the main studies on internal migration in Italy, the main explicative theories on internal migration of natives and immigrants, and the literature regarding the gravity model. Section 3 introduces the aggregate data and the gravity model in its basic and implemented formulation. Section 4 presents the descriptive results, and we discuss the results of the traditional gravity model and its extended version proposed in this article. The final section outlines the main achievements and traces the lines of possible future research developments.

2. THEORETICAL BACKGROUND AND EMPIRICAL REFERENCES

In Italy, internal migration has been the subject of many demographic, economic and social studies (for a review, see Golini, 1974; Mencarini, 1996; Bonifazi, 1999; Etzo, 2008; Reynaud and Tucci, 2014; Piras, 2017). With the growth of foreign immigration in Italy, recent studies have mainly focused on the contribution of foreigners to internal migration (Casacchia *et al.*, 2010a; De Santis, 2010b; Mocetti and Porello, 2010; Brücker *et al.*, 2011; de Filippo and Strozza, 2011; Bonifazi, 2013; Impicciatore and Strozza, 2016b). In relative terms, these studies show that foreigners register a higher level of migration than Italians. This is due to factors such as different social and demographic features: foreign populations are mainly young working adults, being the people more likely to move (de Filippo and Strozza, 2011; Recaño-Valverde and de Miguel-Luken, 2012; Bonifazi *et al.*, 2014). Foreign citizens have also already experienced migration and, therefore, it may be easier for them to migrate again (de Filippo and Strozza, 2011; Impicciatore and Strozza, 2016a).

Considerable attention has been paid in international research to the study of the internal migration of immigrants and to the differences between natives and immigrants (or nationals and non-nationals, majority and minority groups). The main theories on the causes and effects of the internal migration of immigrants are linked to the literature of North American countries, and, more generally, non-European destination countries (Kritz and Nogle, 1994; Frey, 1995; Alba and Nee, 1997). More recently, this issue has been addressed in European countries (Peach, 1996; Kritz and Gurak, 2001; Finney and Catney, 2012). "Ethnic minority and immigrant internal migration is another emerging field of academic interest in many countries, partly as a result of increased political interest in interethnic relations and place-based politics" (Finney and Catney, 2012, pp. 30–31).

The empirical interrelationship between internal migration and the residential distribution of immigrants is the basis of the *spatial assimilation theory* (SAT) (Gordon, 1964; Massey, 1985). According to this theory, the early settlement of immigrants from abroad was generally in large urban cities or areas where their national or ethnic groups were more concentrated (ethnic concentration). Afterwards, immigrants tend to be distributed in a more similar pattern to that of the natives. They leave their areas of first arrival and relocate within the host country through internal migration (Gordon, 1964; Massey, 1985). Geographical migration is a result of the socio-economic upward mobility of immigrants who, through the assimilation process, gain knowledge and are more tied to the host country and the native population. Conversely, this leads to a reduction in ties with the community of origin, less segregation and a convergence of the settlement model of immigrants and natives.

We can hypothesise that the *migration network theory* (MNT) is an alternative to the SAT. "Migrant networks are sets of interpersonal ties that link migrants, former migrants and non-migrants in origin and destination areas through the bonds of kinship, friendship and shared origin of community" (Massey, 1988, p. 396). Networks enable immigrants to accumulate social capital, facilitate the acquisition and the distribution of information, and the availability of ethnic goods and services, and reduce the costs of migration and the risk of discrimination in labour markets. This could, therefore, guide the internal migration of immigrants (Finney and Simpson, 2008). The populations of origin and destination have been considered as explanatory variables in the migratory flows of nationals and non-nationals: they have a direct effect because "the presence of existing communities reduces the costs associated with the migration process" (Recaño-Valverde and de Miguel Luken, 2012).

The *white-flight theory* (WFT) originated from the idea that once the proportion of non-whites exceeds the limits of the neighbourhood's tolerance for interracial living, white people move out (Grodzins, 1958). Some authors have tried to discover whether immigrant communities produce a more substantial barrier effect or even force natives to leave (White and Hunter, 1993; Frey, 1995; Kritz and Gurak, 2001). Some authors have shown a direct relationship between immigration flows and internal out-flows (demographic balkanisation): nationals tend to move from areas that are destination flows for foreigners (White and Hunter, 1993; Van Ham and Feijten, 2008).

There is little research on internal migration in Italy with the aim of verifying the theories described above. We therefore cannot say whether the internal migration of foreigners is more closely linked to and/or depends more on a process of adaptation to the reception reality or if, vice versa, it follows other factors such as network migration. Furthermore, some studies have emphasised the link between international immigration and internal migration through historical reconstructions (Pugliese, 2006). It has also been shown that "the immigration of foreigners can affect the internal migration of natives in Italy" (Brücker *et al.*, 2011). There is little or no evidence regarding the link between internal migration and different populations.

At the aggregate level, the analysis of migration can be conducted by drawing upon the *gravity model*, taking into account both the origin and destination perspectives. This model is based on Newton's gravitational law. The underlying idea is that the flows between two areas are directly proportional to the masses of the two areas and inversely proportional to the distance between the two. This model was widely applied in the empirical analyses of goods and service flows, particularly within the field of international trade (e.g. Fotheringham and O'Kelly, 1989; Sargento Marto, 2007; Metulini *et al.*, 2018). The gravity model has become common in migration research (Ramos, 2016), being applied in the case of both internal (for an overview, see Foot and Milne, 1984; Flowerdew, 2004; Beine *et al.*, 2015; Poot *et al.*, 2016; Wajdi *et al.*, 2017) and international migration analysis (Kim and Cohen, 2010; Ramos, 2016).

Many issues arise when comparing the internal migration of foreigners and nationals. The propensity to migrate is usually higher for foreigners than for nationals (Finney and Catney, 2012; Silvestre and Reher, 2014). Moreover, the negative effect of distance on internal migration is noted as relevant. With regards to migration distance, the results are controversial: in some countries, such as Germany, foreigners tend to move less than nationals over long distances (Şaka, 2012; Vidal and Windzio, 2012); in other countries, such as Sweden, foreigners always have a higher propensity to move regardless of the distance (Andersson, 2012). In Anglo-Saxon countries, studies suggest that distance has a different effect on the mobility of immigrant communities (Gurak and Kritz, 2000; Finney and Simpson, 2008; Belanger and Rogers, 2009; Lichter and Johnson, 2009).

The gravity model was applied in Italy using different approaches and territorial units, which makes it difficult to compare the results obtained. In particular, recent applications have focused on the study of internal migration between regions[2] (Mocetti and Porello, 2010; Brücker *et al.*, 2011; Etzo, 2011; Lamonica and Zagaglia, 2013; Piras, 2017) or between geographical areas defined on an ad hoc basis (Casacchia and Tagliarini, 2000; Casacchia *et al.*, 2010b). Previous applications of the gravity model demonstrated that the negative effect of distance on migration was stronger for foreigners than Italians (Casacchia *et al.*, 2010b; Lamonica and Zagaglia, 2011). The different importance of distance in the inter-provincial migration between the two groups could be another issue to be evaluated.

[2] At the beginning of 2015, the 20 Italian regions had, on average, about 3,000,000 residents and an area of 15,000 square metres. The demographic dimension of the regions is very different (from the minimum of about 300,000 residents in Molise to 10 million residents in Lombardy).

3. DATA AND METHODS

3.1. Statistical data

Statistics on migratory flows in Italy are based on changes in residence among municipalities. This administrative data source briefly highlights the main aspects, quantity, and characteristics of migratory flows. The individual administrative forms are collected by means of a rolling registration at municipality level and report on both the origin and destination of the migratory flows and whether a person moves within the national territory (from one Italian municipality to another), or to/from abroad. Changes in residence data includes information about the main socio-demographic characteristics of migrants, such as citizenship, place and date of birth, gender, marital status, and educational attainment. The main limitation of this source is that only the legal resident population is included, since non-EU citizens, by law, must provide a residence permit to be included in the population registers[3].

The choice of geographical scale to be used is also important, as it may affect the results. Italy is now divided into five major socio-economic regions, NUTS (Nomenclature of Territorial Units for Statistics) 1: North-West, North-East, Centre, South, and Islands. In the following descriptive analysis, the five major socio-economic regions can be reduced to three by aggregating North-East with North-West as ‘North’ and South with Islands as ‘South’. This results in three major regions North, Centre, and South (hereafter called macro geographical areas), 20 regions (NUTS 2), 110 provinces (NUTS 3), and more than 8,000 municipalities. In this paper, we consider the changes in residence among Italian provinces (inter-provincial migration). The importance of provinces at the geographical and administrative level is the best geographic scale to analyse the internal migration in Italy. This territorial grid allows us to obtain a sufficient amount of migratory flows between the territorial units, which are necessary to achieve robust results and to reduce the number of intra-area flows, intentionally neglected by the model. In 2007, the number of provinces increased from 103 to 110. However we continued to use 103 provinces in our study, even though the analysis considers the period from 1995 to 2015[4]. It was therefore necessary to have data for each year (1995, 2000, 2005, 2010 and 2015) on the changes in residence by province of origin and destination and by citizenship (to compare Italian and foreign citizens), so that we have 103 provinces x 103 provinces = 10,609 x 2 (Italians and foreigners) = 21,218 values,

[3] Before 2007 this rule applied to all foreign citizens including those with passports of other EU countries.

[4] The 103 provinces have different characteristics, especially with regards to geographical surface area (from 212 square kilometres in Trieste to almost 7,400 square kilometres in Bolzano), number of municipalities (from 6 municipalities in the province of Trieste to 315 municipalities in the province of Turin) and population size (from less than 100,000 in Isernia to more than 4 million in Rome).

from which the 103 x 2 = 206 values concerning intra-provincial migration were excluded (21,012 rows used). The decision to exclude movements within the same provinces resulted from the hypothesis that short-distance movements are mainly caused by the formation and dissolution of families and for housing/residential reasons (e.g. Biagi *et al.*, 2011; Niedomysl, 2011; Bonifazi, 2013).

3.2. Analytic strategy

Firstly, a descriptive analysis was carried out per province. We estimated the in-migration and out-migration rates (number of changes of residence over the average amount of reference resident population) separately for Italians and foreigners. A gravity model was then applied. The model considered the migratory flows as directly proportional to the product of the masses (represented by the origin and destination resident populations) and inversely proportional to the distance (or to a function of the distance) between the place of origin and the place of destination. The population of the origin area represents the pool of potential migrants: the more an area is populated, the bigger the volume of migration from the area will be (Kim and Cohen, 2010). Instead, the population in the destination area may be a proxy for the attraction of potential migrants (Greenwood, 1997). A larger population provides more economic opportunities since the labour market is larger (Etzo, 2011) and consequently a larger population attracts more migrants (Lewer and Van den Berg, 2008). Migration was considered a direct function of the size of the origin and destination population and an inverse function of the distance (van der Gaag *et al.*, 2003). The sizes of populations act as a push factor and the distance as a pull factor for migration flows (Flores *et al.*, 2013). The distance is certainly a difficult variable to evaluate. A greater distance between the place of origin and the place of destination generates a smaller number of migratory flows. This is also due to difficulties in maintaining links with the territory of origin when the distance is great. It represents a synthesis of many aspects, including the cost of territorial movements. This component includes, for example, relocation costs linked to transport, and the psychological costs faced when leaving one's own environment and when adapting to a completely new one. In several cases, the best synthesis is expressed by travel time (Poot *et al.*, 2016). In other cases, significant differences between the criteria used do not emerge (Poulain and Van Goethem, 1980; Garcia *et al.*, 2015).

The classic formula of the gravity model is the following:

$$f_{ij} = \alpha \frac{P_i^{\beta_1} \cdot P_j^{\beta_2}}{d_{ij}^{\beta_3}}$$

where i is the area of origin and j is the area of destination, f_{ij} is the migratory flow between i and j, P_i and P_j are the respective population sizes, and d_{ij} is the distance between i and j. In our model, the flows correspond to the number of the changes in residence from province i to province j, P_i is the size of the total resident population in the province of origin (origin population), P_j is the size of the total resident population in the province of destination (destination population), d_{ij} is the distance between the two provinces. We calculated the distance between the provincial geographical barycentre, defined as the province's geographical centre, adopting the triangular definitions of distance.

Considering the natural logarithm of both parts of the equation, the model may be estimated via a linear regression using the ordinary least squares method (OLS), although the log-linearisation of the gravity model leads to inconsistent and biased estimates in the presence of heteroscedasticity (Congdon, 1992; Metulini *et al.*, 2018). Since the numbers of migrants are integer values that cannot ever be negative, a Poisson-type specification of the gravity model can be used (Flores *et al.*, 2013)[5]. Poisson pseudo-maximum likelihood (PPML) is an estimation method for gravity models belonging to generalised linear models using quasi-Poisson distribution and a log-link (Santos-Silva and Tenreyro, 2011). This is appropriate even when the conditional variance is far from being proportional to the conditional mean. The function PPML was tested for cross-sectional data. Several studies of trade have since then applied the PPML estimator (Metulini *et al.*, 2018). The assumption here is that migration flows f_{ij} have a Poisson distribution with a conditional mean F_{ij}, which is linked to the independent variables through a logarithmic transformation. The model is:

$$\ln f_{ij} = \beta_0 + \beta_1 \ln P_i + \beta_2 \ln P_j - \beta_3 \ln d_{ij}$$

where $\beta_0 = \ln(\alpha)$.

According to international literature (Biagi *et al.*, 2011; Piras, 2012; Wajdi *et al.*, 2017), we must include two other variables in the model to control for the socio-economic conditions of origin and destination provinces. We consider the unemployment rate (U_i and U_j) as a proxy of the economic situation[6] and the percentage of highly educated 25-64 adults (E_i and E_j) as a proxy of human capital. The first variable refers to one year before the year of analysis, the second to the nearest population census. There is empirical evidence that unemployment rates and human capital are the main determinants of migration flows across Italian regions (Piras, 2012; Fratesi and Percoco, 2014). The coefficient for the unem-

[5] A list of problems linked to the log-linearization of the gravity model can be found in Wajdi *et al.* (2017).

[6] This variable is used as a measure of the local development for origin and destination provinces. The gross domestic product (GDP) and other assimilated measures are not available at this geographical level for all the years considered.

ployment rate at the province of origin is expected to have a positive effect on out-flow and a negative effect on in-flow in the same province. The coefficient for the percentage of highly educated adults in the provinces of origin are expected to be positive, as is that of the destination provinces. There are various explanations in subject literature to support these assumptions; one of the most relevant is the following: highly educated potential migrants generally have a higher propensity to migrate from origin provinces. A high level of education is associated with a greater demand for educated persons and, consequently, for higher in-flows (Wajdi *et al.*, 2017).

The cross-sectional independence of observations is required by the PPML estimator and it can be achieved with the inclusion of dummy variables. The inclusion of dummies suffices to restore the cross-sectional independence of the residuals (Bertoli and Moraga, 2015). A way of extending the basic gravity model is thus to add dummy variables to control geographical condition (Lewer and Van de Berg, 2008). We added two dummy variables to each considered model. One such variable was contiguity among provinces ($cont_{ij}$) representing a common border between provinces ($cont_{ij}$=1 if there is contiguity and $cont_{ij}$=0 if not). The second variable is the same major region (sr_{ij}), which is a dummy variable equal to 1 for pairs of provinces belonging to the same macro geographical areas (North, Centre, and South) and 0 otherwise. We included the contiguity dummy in our model because people are likely to move to neighbouring provinces (Lewer and Van den Berg, 2008; van Lottum and Marks, 2012; Flores *et al.*, 2013). The provinces that share a border should record significantly higher flows than provinces without a common border, as clearly noted in many studies (e.g. Van Lottum and Marks, 2012; Flores *et al.*, 2013; Gómez-Herrera, 2013; Bertoli and Moraga, 2015). Thanks to the "historical" social economic gap among macro geographical areas, internal migration has principally been characterised by a pattern of South-North migration. Even if this pattern is changing, strong differences among macro geographical areas persist. We consider a dummy variable representing the same macro geographical area of origin and destination provinces to control the importance of flows among macro geographical areas. We expect the coefficient of this variable to be negative for provinces belonging to the same macro geographical areas, according to the importance of the inter-macro geographical area migration in Italy.

Therefore, the model becomes:

$$\begin{aligned}\ln F_{ij} &= \beta_0 + \beta_1 \ln P_i + \beta_2 \ln P_j - \beta_3 \ln d_{ij} + \beta_4 \ln U_i + \beta_5 \ln U_j + \\ &+ \beta_6 \ln E_i + \beta_7 \ln E_j + \beta_8 \ln cont_{ij} + \beta_9 \ln sr_{ij}\end{aligned} \quad [1]$$

The model was then modified in order to consider the migratory flows of Italians and foreigners in a unique model by using a dummy variable (Italians/foreigners).

Towards this aim, we introduced a third dummy variable λ set at 0 when citizenship (z) is equal to Italian (I), and set at 1 when z is equal to foreigners (F).

Therefore the model is:

$$\begin{aligned}\ln F_{ij}^{z} &= \beta_0 + \beta_1 \ln P_i + \beta_2 \ln P_j - \beta_3 \ln d_{ij} + \beta_4 \ln U_i + \beta_5 \ln U_j + \\ &+\beta_6 \ln E_i + \beta_7 \ln E_j + \beta_8 \ln cont_{ij} + \beta_9 \ln sr_{ij} + \\ &+\lambda^z (\Delta\beta_0 + \Delta\beta_1 \ln P_i + \Delta\beta_2 \ln P_j - \Delta\beta_3 \ln d_{ij} + \Delta\beta_4 \ln U_i + \Delta\beta_5 \ln U_j + \\ &+\Delta\beta_6 \ln E_i + \Delta\beta_7 \ln E_j + \Delta\beta_8 \ln cont_{ij} + \Delta\beta_9 \ln sr_{ij})\end{aligned} \quad [2]$$

Consequently, when the flow relates to Italians (z=I), the model becomes:

$$\begin{aligned}\ln F_{ij}^{I} &= \beta_0 + \beta_1 \ln P_i + \beta_2 \ln P_j - \beta_3 \ln d_{ij} + \beta_4 \ln U_i + \beta_5 \ln U_j + \\ &+\beta_6 \ln E_i + \beta_7 \ln E_j + \beta_8 \ln cont_{ij} + \beta_9 \ln sr_{ij}\end{aligned} \quad [2a]$$

When the flow relates to foreigners (z=F), the dummy variable (λ) is equal to 1 and the model can be therefore expressed as:

$$\begin{aligned}\ln F_{ij}^{F} &= (\beta_0 + \Delta\beta_0^F) + (\beta_1 + \Delta\beta_1^F)\ln P_i + (\beta_2 + \Delta\beta_2^F)\ln P_j - (\beta_3 + \Delta\beta_3^F)\ln d_{ij} + \\ &+(\beta_4 + \Delta\beta_4^F)\ln U_i + (\beta_5 + \Delta\beta_5^F)\ln U_j + (\beta_6 + \Delta\beta_6^F)\ln E_i + (\beta_7 + \Delta\beta_7^F)\ln E_j + \\ &+(\beta_8 + \Delta\beta_8^F)\ln cont_{ij} + (\beta_9 + \Delta\beta_9^F)\ln sr_{ij}\end{aligned} \quad [2b]$$

With this modification, we obtained a simultaneous and comparable estimation of the effects of population size, distance, and dummy variables on the migratory flows of Italians and foreigners.

A different version of the model can be expressed by considering not only the total population in the place of origin and destination, but also the populations of both Italians and foreigners as explanatory variables. This model takes into account the cross effect of the foreign population on the migratory flows of Italians and, vice versa, by using a unique model. The idea is to include both Italian and foreign populations in the model as explanatory variables, hypothesising that the Italian population has a stronger effect on the migratory flows of Italians and the foreign population on the migratory flows of foreigners.

If we consider the four populations (Italian population P^I_i in the province of origin, foreign population in the province of origin P^F_i, Italian population in the province of destination P^I_j, and foreign population in the province of destination P^F_j), the model becomes:

$$\begin{aligned}\ln F_{ij}^{z} &= \beta_0 + \beta_1 \ln P_i^I + \beta_2 \ln P_j^I + \beta_3 \ln P_i^F + \beta_4 \ln P_j^F - \beta_5 \ln d_{ij} + \\ &+\beta_6 \ln U_i + \beta_7 \ln U_j + \beta_8 \ln E_i + \beta_9 \ln E_j + \beta_{10} \ln cont_{ij} + \beta_{11} \ln sr_{ij} + \\ &+\lambda^z (\Delta\beta_0 + \Delta\beta_1 \ln P_i^I + \Delta\beta_2 \ln P_j^I + \Delta\beta_3 \ln P_i^F + \Delta\beta_4 \ln P_j^F - \Delta\beta_5 \ln d_{ij} + \\ &+\Delta\beta_6 \ln U_i + \Delta\beta_7 \ln U_j + \Delta\beta_8 \ln E_i + \Delta\beta_9 \ln E_j + \Delta\beta_{10} \ln cont_{ij} + \Delta\beta_{11} \ln sr_{ij})\end{aligned} \qquad [3]$$

Therefore, when the flow relates to Italians, the model becomes:

$$\begin{aligned}\ln F_{ij}^{I} &= \beta_0 + \beta_1 \ln P_i^I + \beta_2 \ln P_j^I + \beta_3 \ln P_i^F + \beta_4 \ln P_j^F - \beta_5 \ln d_{ij} + \\ &+\beta_6 \ln U_i + \beta_7 \ln U_j + \beta_8 \ln E_i + \beta_9 \ln E_j + \beta_{10} \ln cont_{ij} + \beta_{11} \ln sr_{ij}\end{aligned} \qquad [3a]$$

When the flow relates to foreigners, the dummy (λ) is equal to one and the model can be expressed as:

$$\begin{aligned}\ln F_{ij}^{F} &= (\beta_0 + \Delta\beta_0^F) + (\beta_1 + \Delta\beta_1^F) \ln P_i^I + (\beta_2 + \Delta\beta_2^F) \ln P_j^I + \\ &+(\beta_3 + \Delta\beta_3^F) \ln P_i^F + (\beta_4 + \Delta\beta_4^F) \ln P_j^F - (\beta_5 + \Delta\beta_5^F) \ln d_{ij} + \\ &+(\beta_6 + \Delta\beta_6^F) \ln U_i + (\beta_7 + \Delta\beta_7^F) \ln U_j + (\beta_8 + \Delta\beta_8^F) \ln E_i + \\ &+(\beta_9 + \Delta\beta_9^F) \ln E_j + (\beta_{10} + \Delta\beta_{10}^F) \ln cont_{ij} + (\beta_{11} + \Delta\beta_{11}^F) \ln sr_{ij}\end{aligned} \qquad [3b]$$

The Akaike Information Criterion (AIC) (Flores *et al.*, 2013) and the residual deviance (Flowerdew and Aitkin, 1982) are reported for evaluating the fitness of regression models for each estimated model.

4. INTERNAL MIGRATION: APPLICATION OF THE GRAVITY MODEL

4.1 Descriptive results

In the 1990s, after a phase of stagnation, internal migration in Italy recorded an upturn. In absolute values, the internal flows shifted from 1.11 million in 1995 to 1.56 in 2012[7] with a total increase of 456,000 units (Table 1). This increase was mainly due to the foreign population: there were 41,000 changes in residence of foreign citizens in 1995 and 279,000 in 2012. The role of foreigners in internal

[7] The peak recorded for 2012 was due to a modification in the mechanism used for the registration of changes in residency between municipalities.

migration became more relevant over these years (from 4% in 1995 to 18% in 2012), as it did in Spain over the same period (Recaño-Valverde and de Miguel Luken, 2012). Afterwards, the changes of residence decreased to 1.28 million in 2015. The contribution of foreigners remained relevant at the same level (18%). Only in 2015 did this contribution decrease slightly (Table 1).

Table 1. Changes of residence by citizenship and type of migration. Absolute values (thousands) and percentages over total number of changes, Italy, 1995–2015

	Italian (a)			Foreign (b)			All citizenships: (a)+(b)		
Year	Total	Between provinces		Total	Between provinces		Total	Between provinces	
		a.v.	%		a.v.	%		a.v.	%
1995	1,069	422	39.5	41	19	45.7	1,110	441	39.7
1996	1,052	424	40.3	44	20	45.5	1,096	444	40.5
1997	1,099	436	39.7	54	25	45.5	1,153	461	40.0
1998	1,131	451	39.8	69	33	47.2	1,200	484	40.3
1999	1,145	461	40.3	74	33	45.2	1,219	494	40.5
2000	1,184	484	40.9	88	40	45.8	1,272	524	41.2
2001	1,040	426	40.9	93	43	45.9	1,133	469	41.4
2002	1,115	452	40.5	109	47	43.3	1,224	499	40.8
2003	1,101	439	39.8	115	48	41.8	1,216	487	40.0
2004	1,149	448	39.0	162	63	39.1	1,311	511	39.0
2005	1,136	442	38.8	185	69	37.3	1,321	511	38.6
2006	1,164	452	38.8	204	78	38.4	1,368	530	38.7
2007	1,176	451	38.4	204	76	37.3	1,380	527	38.2
2008	1,176	453	38.6	213	79	37.0	1,389	532	38.3
2009	1,098	425	38.8	215	81	37.5	1,313	506	38.5
2010	1,120	442	39.5	225	87	38.6	1,345	529	39.3
2011	1,120	438	39.1	238	94	39.6	1,358	533	39.2
2012	1,277	505	39.5	279	113	40.6	1,556	618	39.7
2013	1,113	443	39.8	249	101	40.4	1,362	544	39.9
2014	1,074	424	39.5	239	97	40.4	1,313	521	39.7
2015	1,082	424	39.2	202	85	42.1	1,284	509	39.7

Source: based on Istat data.

Our analysis excluded movements within the province, although they represent the majority of the changes in residence (about 60%). From now on, we will consider only the migration between Italian provinces (inter-provincial migration). Focusing on the internal migration of Italians only, the number of the changes in residence among provinces accounted for 39% of the total number of the changes in residence (Table 1). There was a constant increase in the number of the changes in residence for foreigners between Italian provinces, but the share of the total changes in residence dropped from 46% in 1995 to less than 39% in the period 2005–2011. The absolute number of the changes in residence among provinces has decreased since 2013 (Table 1).

Between 1995 and 2015, interprovincial in-migration and out-migration rates were always (with only one exception) under 10 per a thousand residents for Italians, and between 15 and 50 per a thousand for foreigners. This is consistent with the results reported in literature, in which the internal migration rates of foreigners were higher than the rates of Italians. The interprovincial in-migration and out-migration rates of both populations registered a constant increase in the period between 1995 and 2000, and a sharp drop in the period between 2000 and 2015 (Fig. 1).

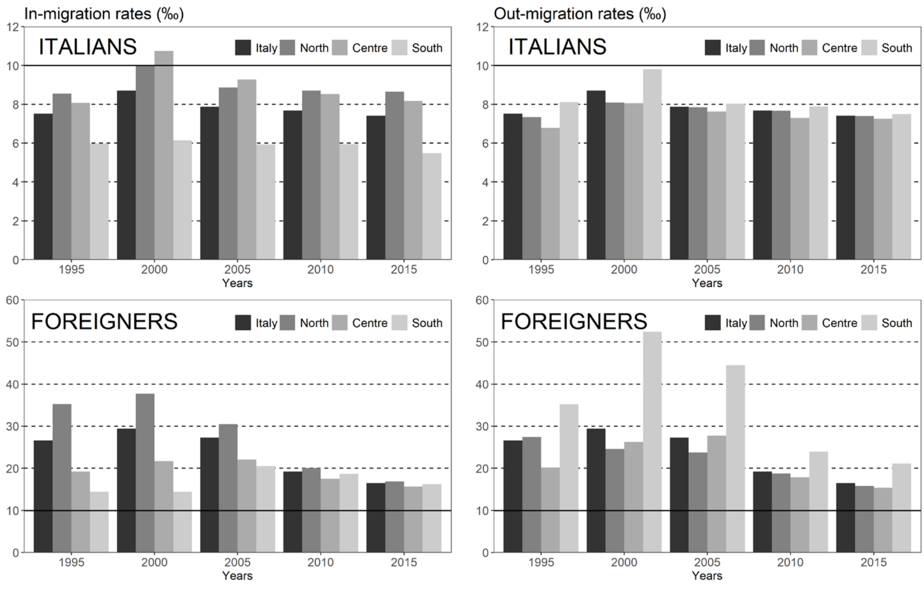

Fig. 1. Inter-provincial in-migration and out-migration rates (per a thousand of resident population) by citizenship and geographical division, Italy, 1995, 2000, 2005, 2010, and 2015

Source: based on Istat data.

Focusing only on the internal migration of Italians, Figure 1 shows a clear dichotomy between the Centre-North and the South of Italy for all the years considered: the North and Centre of Italy reported the highest level of in-migration, while the South had the highest rates of out-migration. In general, foreigners followed the same migration patterns but with a different level of intensity (Fig. 1).

4.2. Model with the total populations

The aim of our analysis is to explain the different internal migration behaviour of the resident population according to citizenship. To this end, we chose to analyse the internal migration of foreigners and Italians using a unique model so the coefficients can be compared. As discussed in Section 3, the model hypothesises that the origin and destination populations have a positive effect on the sizes of migratory flows. The model also hypothesises that the distance between provinces has a negative effect on the sizes of migratory flows. An intuitive assumption is that the negative effect of distance is smaller for foreigners, since they are less tied to the territory of origin and are more likely to travel longer distances as they have already experienced international migration. Foreigners should record a lower value for the coefficients of geographical variables than Italians, for the same reasons as just mentioned. The expected coefficients for the two socio-economic variables (the unemployment rate and the percentage of highly educated adults) should have the sign found in literature and presented in Section 3. This is positive for the unemployment rate in the province of origin and negative for that in the province of destination; the coefficients concerning the percentage of highly educated adults are positive for both origin and destination provinces.

The results of the model confirmed our hypothesis about the role of explanatory variables: the total populations have a positive coefficient and, therefore, a direct effect, while the negative coefficient of distance reveals the inverse effect between the number of migrants and the distance. The coefficient of unemployment rates in the province of origin is, as expected, always positive for Italians; for foreigners, this has not been true for the last two years (2010 and 2015). This could be explained by the situation in the labour market during the economic crisis, since foreigners are probably employed in the irregular economy more than they have been in the past. The coefficient of the unemployment rate in the province of destination is always negative but it was not significant for Italians in 2010 due to the economic crisis and consequently the generalised increase in unemployment. Human capital has the hypothesised effects over time for both Italians and foreigners. The pull effect of this variable is more important than the push one, above all for Italians. The coefficients of geographical dummy variables show the expected sign even if their effects are smaller in the case of foreign migration within the same major region (Table 2).

Table 2. Parameter estimates of Poisson pseudo-maximum likelihood (PPML): equation [2]. Coefficient of independent variables on the inter-provincial migratory flows of Italians and foreigners, Italy, 1995, 2000, 2005, 2010, and 2015

Parameters (variable) / Year	1995	2000	2005	2010	2015
β_0 (constant)	-22.59***	-25.20***	-24.71***	-24.83***	-25.49***
β_1 (size of the total population in origin P_i)	0.93***	0.98***	0.97***	0.94***	0.90***
β_2 (size of the total population in destination P_j)	0.78***	0.84***	0.82***	0.88***	0.90***
β_3 (Distance d_{ij})	-0.37***	-0.34***	-0.42***	-0.45***	-0.49***
β_4 (unemployment rate in origin U_i)	0.50***	0.40***	0.37***	0.45***	0.52***
β_5 (unemployment rate in destination U_j)	-0.14***	-0.21***	-0.15***	-0.01 n.s.	-0.11***
β_6 (percentage of highly educated adults in origin E_i)	0.55***	0.15***	0.50***	0.19***	0.49***
β_7 (percentage of highly educated adults in destination E_j)	0.86***	1.49***	1.21***	1.27***	1.21***
β_8 (Contiguity $cont_{ij}$)	1.82***	1.77***	1.75***	1.72***	1.66***
β_9 (same major region sr_{ij})	-0.07***	-0.12***	-0.14***	-0.15***	-0.12***
Differential effect of foreigners					
$\Delta\beta^F_0$ (constant)	-0.92***	2.02***	5.41***	1.69***	2.82***
$\Delta\beta^F_1$ (size of the total population in origin P_i)	-0.05***	-0.07***	-0.05***	-0.11***	-0.05***
$\Delta\beta^F_2$ (size of the total population in destination P_j)	0.12***	-0.05***	-0.08***	-0.08***	-0.03***
$\Delta\beta^F_3$ (Distance d_{ij})	-0.26***	-0.24***	-0.27***	-0.34***	-0.30***
$\Delta\beta^F_4$ (unemployment rate in origin U_i)	-0.41***	-0.04***	-0.27***	-0.66***	-0.57***
$\Delta\beta^F_5$ (unemployment rate in destination U_j)	-0.88***	-0.86***	-0.86***	-0.45***	-0.33***
$\Delta\beta^F_6$ (percentage of highly educated adults in origin E_i)	0.12*	0.58***	0.28***	0.64***	0.13**
$\Delta\beta^F_7$ (percentage of highly educated adults in destination E_j)	0.21***	-0.53***	-0.84***	0.17***	-0.01 n.s.
$\Delta\beta^F_8$ (Contiguity $cont_{ij}$)	-0.72***	-0.52***	-0.41***	-0.47***	-0.50***
$\Delta\beta^F_9$ (same major region sr_{ij})	0.04*	0.03*	0.04***	0.07***	0.004 n.s.

Number of observation	440,938	524,434	510,604	529,162	509,339
Residual deviance of null model (21,011 degree of freedom)	1,730,597	1,941,526	1,814,960	1,784,543	1,695,411
Residual deviation of model (21,000 degree of freedom)	251,147	305,595	289,381	277,134	234,908
AIC of null model	1,785,617	2,003,236	1,881,236	1,853,494	1,764,196
AIC of model	306,205	367,344	355,696	346,124	303,372

Significant codes: * at 0.1 level, ** at 0.01 level, *** at 0.001, n.s. not significant.

Source: our work based on Istat data.

It is interesting to note that, for the migratory flows of Italians, the effect of the total origin population (β_1) has droped off over time from 2000, while the effect of the total destination population (β_2) has increased (except in 2005), probably due to the introduction of more complex patterns of relationships and migration.

The most interesting result is that the populations of origin and destination have a similar effect on the migratory flows of Italians and foreigners, given that the parameters $\Delta\beta^F_1$ and $\Delta\beta^F_2$ are close to zero but significant. We also noted that, in time, the population masses (in the provinces of origin and destination) for foreigners have a smaller effect than those for Italians (except in 1995 in the province of destination). For example, in 2015, the coefficient of the total population in the province of origin was equal to 0.90 for Italians and 0.85 (which is 0.90-0.05) for foreigners, while the coefficient of total population in the province of destination was equal to 0.90 for Italians and 0.87 (which is 0.90-0.03) for foreigners (Table 2).

Then, the parameter $\Delta\beta^F_3$ (which expresses the differential effect that should be added to β_3 to quantify the effects of the distance on the migratory flows of foreigners) is negative and highly significant (Table 2). This suggests that the negative effect of distance is stronger for foreigners, in contrast to the hypothesis that the distance counts more for Italians since foreigners are less tied to the place of origin. The contiguity has a significant positive effect for migratory flow as pointed out in literature, in particular for Italians. The same area has a negative effect on Italian flows, demonstrating that, *ceteris paribus*, the migratory flows between two geographical areas are more numerous than those within the same major region. That is not true for those of foreigners.

4.3. Model with different populations

A debatable point in the last model is that the overall resident population is considered an explanatory variable. In reality, the Italian and foreign resident populations, and not just the total population, might have different effects on Italian and foreign internal migrations. It is thus possible to hypothesise that the populations with the greatest influence on the flow of foreigners are the foreign populations themselves. The size of the foreign population could also be a proxy of the economic situation of the provinces. In this case, a large number of foreigners (which we hypothesised is greater in the wealthier and most dynamic provinces in the country) should have a negative effect on Italian emigration and a positive effect on Italian immigration. The model with different populations provides a more accurate explanation of the role played by the masses, having distinguished between the populations in Italians and foreigners.

With regard to the migratory flows of Italians, the Italian population in the province of origin always plays the strongest migratory role, even though its effect decreased in the previous year (Table 3). It is interesting to note that the foreign population in the province of destination has a direct and statistically significant impact on the size of the Italian flows. Then again, the foreign population in the province of origin has a slight negative effect on the Italian internal migration: in the period analysed (except 2000), the larger the foreign population in the province of origin was, the lower the impetus for Italians to out-migrate appeared. That was probably due to the higher presence of foreigners in areas with better economic conditions and job opportunities, since foreigners tend to settle in the most dynamic areas of the country (Cangiano and Strozza, 2005; Bonifazi and Marini, 2010). In other words, the large foreign population appears to be an indirect sign of the economic dynamism of a territory. The effects of socioeconomic variables are similar to those of the previous model (see Table 2), even if the effects of the unemployment rate in the province of destination are very small. The percentage of highly educated adults has a less important pull effect than estimated in the previous model. Conversely, the coefficient related to a high level of education in the province of origin is higher in the latter model for the last two years (2010 and 2015). The effects of geographical variables between the provinces of origin and destination were confirmed as in the previous model.

Table 3. Parameter estimates of Poisson pseudo-maximum likelihood (PPML): equation [3]. Coefficient of independent variables on the inter-provincial migratory flows of Italians and foreigners, Italy, 1995, 2000, 2005, 2010 and 2015

Parameters (variable)	Years				
	1995	2000	2005	2010	2015
$\boldsymbol{\beta}_0$ (constant)	-20.68***	-21.69***	-23.69***	-24.48***	-24.58***
$\boldsymbol{\beta}_1$ (size of the Italian population in origin P^I_i)	0.94***	0.99***	1.01***	1.06***	0.96***
$\boldsymbol{\beta}_2$ (size of the Italian population in destination P^I_j)	0.57***	0.46***	0.61***	0.68***	0.66***
$\boldsymbol{\beta}_3$ (size of the foreign population in origin P^F_i)	-0.01*	0.01*	-0.03***	-0.12***	-0.05***
$\boldsymbol{\beta}_4$ (size of the foreign population in destination P^F_j)	0.19***	0.32***	0.19***	0.19***	0.23***
$\boldsymbol{\beta}_5$ (Distance d_{ij})	-0.38***	-0.34***	-0.41***	-0.46***	-0.49***
$\boldsymbol{\beta}_6$ (unemployment rate in origin U_i)	0.50***	0.40***	0.32***	0.30***	0.43***
$\boldsymbol{\beta}_7$ (unemployment rate in destination U_j)	-0.04***	-0.02***	-0.02***	-0.12***	-0.02***
$\boldsymbol{\beta}_8$ (percentage of highly educated adults in origin E_i)	0.57***	0.14***	0.52***	0.45***	0.60***
$\boldsymbol{\beta}_9$ (percentage of highly educated adults in destination E_j)	0.53***	0.99***	1.05***	1.03***	1.00***
$\boldsymbol{\beta}_{10}$ (contiguity $cont_{ij}$)	1.82***	1.78***	1.76***	1.72***	1.67***
$\boldsymbol{\beta}_{11}$ (same major region sr_{ij})	-0.06***	-0.08***	-0.13***	-0.14***	-0.12***

Parameters (variable)	Years				
	1995	2000	2005	2010	2015
Differential effect of foreigners					
$\Delta\beta^F_0$ (constant)	9.01***	12.33***	11.26***	9.31***	8.61***
$\Delta\beta^F_1$ (size of the Italian population in origin P^I_i)	-0.57***	-0.82***	-0.66***	-0.81***	-0.67***
$\Delta\beta^F_2$ (size of the Italian population in destination P^I_j)	-0.40***	-0.49***	-0.76***	-0.49***	-0.49***
$\Delta\beta^F_3$ (size of the foreign population in origin P^F_i)	0.46***	0.64***	0.56***	0.66***	0.59***
$\Delta\beta^F_4$ (size of the foreign population in destination P^F_j)	0.44***	0.37***	0.61***	0.38***	0.44***
$\Delta\beta^F_5$ (Distance d_{ij})	-0.27***	-0.21***	-0.22***	-0.26***	-0.22***
$\Delta\beta^F_6$ (unemployment rate in origin U_i)	-0.12***	0.33***	0.33***	-0.02 n.s.	-0.07***
$\Delta\beta^F_7$ (unemployment rate in destination U_j)	-0.64***	-0.68***	-0.34***	-0.08***	0.04**
$\Delta\beta^F_8$ (percentage of highly educated adults in origin E_i)	-0.75***	-0.48***	-0.19***	-0.41***	-0.61***
$\Delta\beta^F_9$ (percentage of highly educated adults in destination E_j)	-0.48***	-0.92***	-1.15***	-0.37***	-0.53***
$\Delta\beta^F_{10}$ (Contiguity $cont_{ij}$)	-0.73***	-0.48***	-0.36***	-0.39***	-0.42***
$\Delta\beta^F_{11}$ (same major region sr_{ij})	0.06**	0.07***	0.10***	0.11***	0.06***
Number of observation	440,938	524,434	510,604	529,162	509,339
Residual deviance of null model (21.011 degree of freedom)	1,730,597	1,941,526	1,814,960	1,784,543	1,695,411
Residual deviance of model (21.000 degree of freedom)	247,961	296,698	282,699	269,704	229,658
AIC of null model	1,785,617	2,003,236	1,881,236	1,853,494	1,764,196
AIC of model	303,026	358,454	349,021	338,701	298,490

Significant codes: * at 0.1 level ** at 0.01 level *** at 0.001 level

Source: our work based on Istat data.

With regard to foreign internal migration, the size of the Italian population in the destination provinces had a negative impact in 2000 and 2005, revealing a preference for provinces with a smaller Italian population. In fact, foreigners move from provinces with a larger demographic size (attractive for international immigrants), to smaller provinces, probably because of the more accessible housing market. We can note that this coefficient became positive in 2010 (0.68–0.49=0.19) and in 2015 (0.66-0.49=0.17), probably due to the stronger effects of the economic crisis in those provinces. This appears to be in line with the fact that the internal migration of foreigners is more flexible and more affected by changes in job opportunities and economic conditions. Conversely, the effect of the Italian population in the province of origin on the internal migration of foreigners is always positive, while the differential effect for foreigners is negative; for example, in 2015, the coefficient of the Italian population in the province of origin was equal to 0.96 for Italians and 0.29 (which is 0.96-0.67) for foreigners. The effect of the Italian population in the province of origin on the internal migration of foreigners is thus significantly lower than the same effect on the internal migration of Italians.

The estimated parameters of the foreign population, in both origin and destination provinces, are always positive and crucial to explain the inter-provincial migratory flows of foreigners. The effect of the foreign population in the province of destination is stronger than that in the province of origin. That reminded us of the possible roles played by social capital and migratory networks in directing internal transfers among the members of an immigrant community (Kritz and Nogle, 1994; Gurak and Kritz, 2000). This seems to be more significant than socio-economic conditions, because the effects of this kind of variable are less important in this model than their effects in the previous model (compare the results in Table 2 and Table 3).

Lastly, this model confirms that the negative effect of the distance is stronger among foreigners than among Italians. In fact, the coefficients of the differential effect of the distance for foreigners are negative and they add to the already negative effect of the Italian coefficients: for example, in 2015 this was -0.49 for Italians and -0.71 for foreigners (which was -0.49-0.22). While the effects of two geographical dummy variables for foreigners were lower than for Italians, confirming that they had weak ties to territory.

In conclusion, the Italian populations in both the origin and destination provinces and the contiguity show the main associations for the internal migration of Italians. With regard to foreigners, the foreign population in the province of destination, the Italian population in the province of origin, the distance, and the contiguity between origin and destination provinces have the main associations.

5. CONCLUSION

Using a modified extended version of the gravity model, we aimed to evaluate the importance of demographic and geographic variables for the inter-provincial migration of Italians and foreigners. The article focuses on two distinct research questions: first, we wanted to evaluate whether the inter-provincial migration of foreigners follows a process of spatial assimilation or whether it is driven by the attractiveness of the migration networks; secondly, we wanted to examine whether or not the inter-provincial migration of Italians is affected by the foreign population.

The analysis of the inter-provincial migratory flows by citizenship has confirmed significant differences in the push and pull variables affecting the intensity of Italian and foreign internal migrations. As expected, the greater the size of the Italian resident population in the provinces of origin, the higher the dimension of migratory outflow, for both Italians and foreigners. The differences between the effects of this explanatory variable between Italians and foreigners do not change significantly over time. The attractive force of the Italian resident population in the provinces of destination has a direct effect on the internal migration of Italians and it is more relevant for the flows of Italian citizenship. Conversely, the size of the Italian population in the province of destination had a negative effect on the migration of foreigners in 2000 and 2005. The latter effect on the migration of foreigners could be read against the theory of spatial assimilation. In other words, if one takes into account the fact that foreigners have always been concentrated in the provinces with the highest demographic dimension, the negative value of the effect could be interpreted as an indicator of an ongoing process of geographical redistribution. However, this is not in opposition to the hypothesis of the importance of the migration network. In fact, the internal migration of foreigners is mainly affected by the number of foreigners in destination areas. This result appears to be congruent with the ethnic concentration hypothesis and in line with the following considerations. This effect changed in the last two years considered, when it assumed a similar level to that observed in the first year considered (1995). With regard to foreign flows, the attractiveness of the foreign population in the destination province is even stronger than the push effect of the Italian population in the origin province, suggesting the probable importance of migratory networks as among the attractive factors. One possible explanation is the role played by ethnic networks, however, our data did not allow us to test that.

Finally, the size of the foreign population in the place of origin has a different effect on internal migration by citizenship. As expected, it has a positive association with the migratory flows of foreigners: the greater the foreign population, the higher the outflow. On the other hand, it has the opposite effect on Italian internal migration. In fact, Italian citizens are reluctant to leave provinces with a high presence of foreigners. In other words, according to the inter-provincial migratory flows, the results of the quantitative analysis do not show any evidence of white-flight theory (WFT) in Italy. It should, however, be stressed that migration between provinces, excluding aspects such as the dichotomy between city central areas and suburban neighbourhoods, might not be completely appropriate for testing this hypothesis. The inclusion of some socio-economic explanatory variables into the model does not affect the results. Therefore, the presence of foreigners cannot be seen as a proxy variable for the economic conditions and job opportunities of an area. That result is in contrast with what has been shown in other countries (e.g. the Netherlands), where, on the contrary, a direct relationship between the presence of foreigners in the place of origin and the out-migration of nationals has been found (Van Ham and Fejiten, 2008).

The impact of the distance on migratory flows is negative for both Italians and foreigners, but its importance differs between the two groups. Foreigners are far more affected by the distance between the place of origin and the place of destination.

Essentially, the results foster a wider use of the gravity model to describe the migration of sub-groups. The proposed model allows us to obtain an initial understanding of the mechanisms behind internal migration by citizenship.

The results of the proposed analyses also have political implications. The level of attractive capacities of some typologies of geographical areas (for example, those of greater or smaller demographic dimensions) could push policymakers to adopt public policies aimed at increasing the attractiveness, or at least attempt to retain the population of disadvantaged areas, through the adoption, for example, of specific incentives. In essence, the results of these applications could provide planners and policymakers with useful information for introducing a planned policy aimed at favouring the redistribution of the population in a given direction. It is also possible to include policy variables in gravity models to evaluate the impact of governmental subsidies, local taxes, defence spending, educational offers, urban area plans, or direct measures such as migration incentives and policies (Van der Gaag *et al.*, 2003; Ramos, 2016), but this last specific aspect does not fall within the objectives of this article.

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