

A Spatial Analysis of Inflows of Foreigners by Citizenship in Italy

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Topic and theoretical focus

Since the beginning of the new millennium, immigration has become a structural phenomenon in Italy, which has definitely joined the group of Europe's main destinations. Data show an annual inflow of more than 200.000 people, between 2002 and 2023. Alongside with the natural dynamics of the foreign population, these flows have caused the number of foreign residents to increase from 1.3 million to 5.1 million, with an incidence of 8.7% being reached. The foreign population in Italy is characterised by a high level of heterogeneity in terms of country of citizenship (Benassi et al., 2024). Nevertheless, it is important to highlight that the top six nationalities accounted for 51% of total immigration in 2022. However, immigration is not evenly spread across the whole territory. Each group displays different migration patterns and settlement arrangements within the territory (see, for example, Benassi et al., 2024, Casacchia et al. 2022), reflecting the globalisation of migration (Strozza, 2019).

The geographical distribution of different foreign communities is indeed a particularly important aspect, since it reflects the segmentation of the labour market, varying levels of integration, and the ability of groups to adapt to local economic dynamics. Moreover, the territorial distribution of communities works as a pull factor for new inflows of the same nationality. As a result, immigration needs to be analysed by examining individual communities, which have their own characteristics and logic, and by differentiating between territorial levels, since their distribution across the country is far from uniform. The study of immigration from a spatial perspective therefore represents an important research challenge, as it allows us to investigate not only where migration phenomena occur, but also how space itself contributes to defining and reproducing them. Space is an essential dimension in the study of demographic phenomena (De Castro 2007; Goodchild et al. 2000; Howell et al. 2016). Unlike the temporal dimension, the spatial dimension has always been overlooked (Matthews, Parker, 2013). That being said, when we deal with migrations, space is not to be considered the mere framework within each population moves, but a fundamental part of the phenomenon. As a matter of fact, proximity, the presence of established communities, and the socio-economic characteristics of territories play an interesting role in generating and consolidating new migration patterns (Benassi et al., 2024; Casacchia et al., 2022). Therefore, space should be acknowledged as both a territorial context, reflecting local opportunities and inequalities, and a neighbourhood structure in which contiguity between areas determines the spread or concentration of the phenomenon (Licari et al., 2020; Miccoli et al., 2025).

Broadly speaking, the territorial distribution of the foreign resident population has traditionally been analysed using indicators, such as concentration and localisation coefficients, in order to describe the spatial heterogeneity and territorial specialisation of communities in Italy (Benassi, Ferrara, 2013) and other national contexts (Oliveau et al., 2019; Antczak, Lewandowska-Gwarda, 2015; Prego, Novotný, 2025). This study takes a different approach, proposing a spatial analysis of inflows by province (Basile, Licari, 2020) and introducing the important distinction by nationality. Thus, we can understand the effect of space as a proxy for different territorial conditions — economic, demographic and social — as well as the degree of attractiveness exerted by the resident population of the same community, which instead is considered a proxy for the strength of migration networks (Heider et al., 2020).

Our aim is to study foreigner inflows in Italy by a spatial approach, since we want to evaluate to what extent the territorial distribution of these inflows reflects proximity and contiguity relations between territorial areas, and whether these relations change between nationalities and over the considered period – between 2002 and 2022. Our leading hypothesis is that the territorial distribution of migration flows is also influenced by spatial factors — in particular geographical proximity and the presence of established migration networks — which can be measured through the intensity of spatial autocorrelation.

Data source and method

Data sources are based on the Municipality Population Register (Anagrafe): registrations of foreign citizens from abroad recorded by province (NUTS3 territorial units according to Eurostat classification) and broken down by nationality, in the two reference years, 2002 and 2022. Registry records were considered for six communities, selected as among the most numerous and representative in the Italian migration landscape: Albanian, Romanian, Moroccan, Ukrainian, Chinese and Bangladeshi. Inflows of each community were compared to the foreign resident population of the same nationality in the corresponding province, in order to calculate immigration rates by community and province.

In the first stage, a descriptive analysis of immigration rates by community and province is carried out, in order to highlight the main territorial differences and changes occurred between 2002 and 2022. Subsequently, the global Moran index (I) is calculated for each community and for the two years considered, in order to account for spatial autocorrelation in immigration rates and its varying importance. Next, the Local Indicators of Spatial Association (LISA) are calculated to identify and map territorial clusters of high or low migration intensity in association with high and low spatial correlation.

At last, we want to estimate a spatiotemporal Poisson regression model, to evaluate how much the distribution of migration flows is driven by territorial and demographic characteristics. In particular, the model takes into account several variables, such as: the specific foreign population of the same community, as a proxy for the strength of migration networks; the total resident population, to estimate the size of the local context; the level of economic development (provincial GDP per capita); and demographic conditions, represented by the level of ageing of the resident population.

Findings and expected findings

The analysis of immigration rates by province shows that the distribution of flows varies significantly between communities and over time, reflecting different stages of the migration process of each foreign group. In 2002, immigration rates were generally lower and more homogeneous across the country for communities already established in Italy, such as the Albanian community; higher but less homogeneous for communities for which emigration is still strong, such as the Chinese community (Fig. 1). These communities will have a more widespread presence and lower levels of immigration in 2022 (Fig. 1). Conversely, more recently settled communities, such as the Bangladeshis, showed high immigration rates only in a few provinces in 2002. By 2022, however, they displayed higher values across a larger number of provinces, with a more polarised spatial distribution.

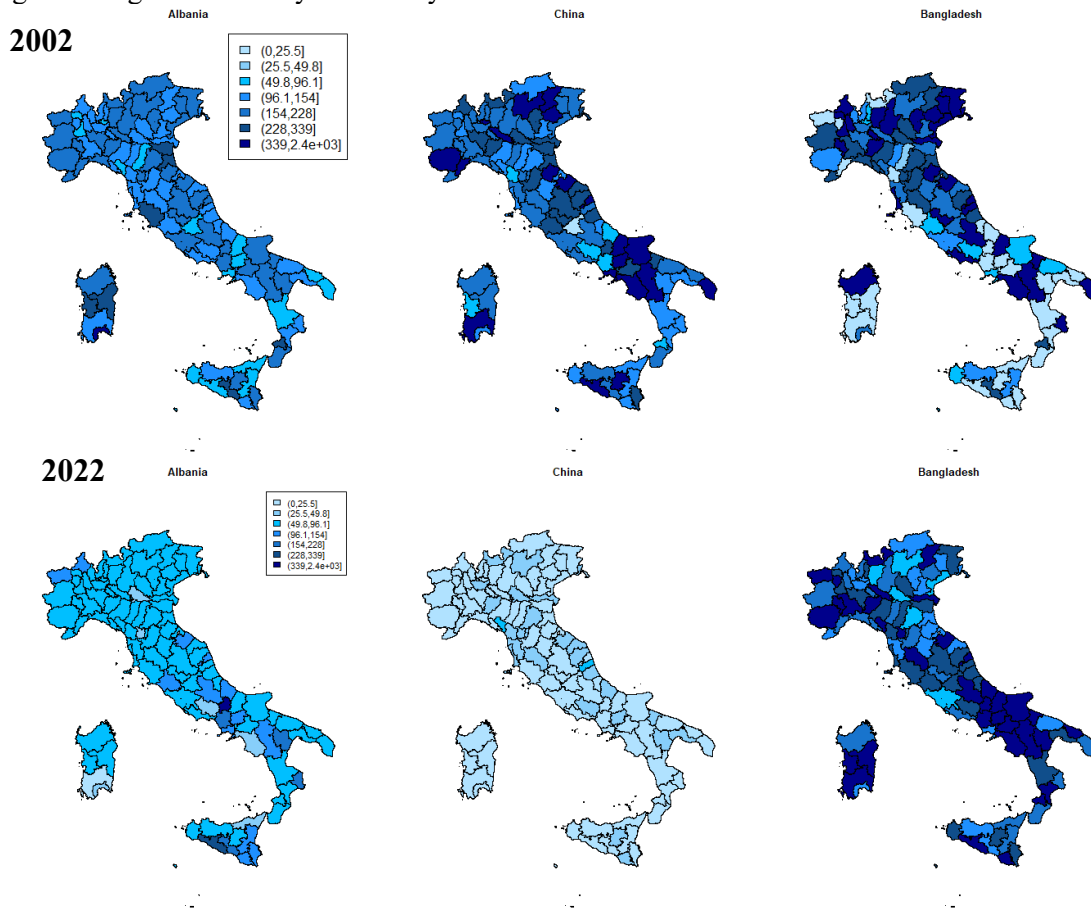
As regards the Moran index values, these are low but all significant, highlighting differentiated spatial patterns between communities that are consistent with their different migration histories and level of attractiveness. Communities that had been established for at least ten years, such as the Albanian community, exhibited greater spatial autocorrelation in 2002, indicating territorial clustering. However, two decades later, the index fell sharply, signalling a greater spread of flows across the territory. However, when it comes to the Chinese community, autocorrelation increases over time, rising from values close to zero to higher levels in 2022. This suggests the formation of centres of attraction, which are often linked to specific labour markets and the greater influence of migration networks. In contrast, the Bangladeshi community initially exhibited negative values, which have recently become positive. This reflects a work-in-progress spatial pattern and the increasing pull effect of the resident population. Overall, it appears that the more mature the migration process becomes, the more spatial autocorrelation weakens, leading to a more homogeneous distribution of communities across the territory.

The LISA analysis confirms the results highlighted by the Moran index, allowing us to identify provincial clusters characterised by similar levels of immigration. On the whole, the local maps show how flows are organised into areas of concentration consistent with the stage of development of the migration process in different communities. The Chinese community, for example (Fig. 2), had small clusters of provinces with high levels of immigration and high spatial autocorrelation in 2002, but larger and more numerous clusters in 2022. This is a sign of greater territorial expansion and consolidation of the Chinese presence and the strengthening of migration networks.

The spatiotemporal regression model is expected to reveal significant differences in the effects of the explanatory variables depending on the migration history and the different sizes of the communities' populations. For communities with greater spatial autocorrelation, the role of the resident population of the same nationality is expected to be more significant. This would confirm the greater influence exerted by migration networks compared to the economic and demographic conditions of the provinces. Conversely, for more integrated and permanently settled communities, it is expected that flows will be more influenced by

the structural characteristics of the territories, and in particular by the opportunities offered by local economic and demographic conditions.

Fig. 1 Immigration rates by nationality. Year 2002 and 2022

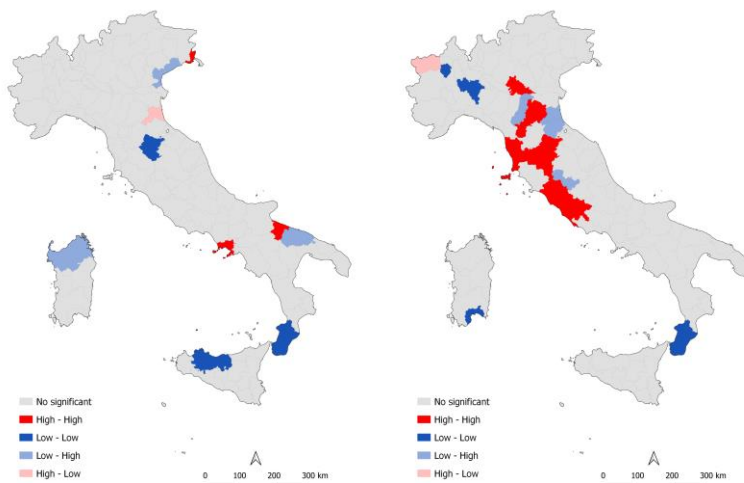


Tab. 1 Moran index by citizenship on immigration rates at provincial level. Year 2002 and 2022

Citizenship	2002	2022
Albania	0.293	0.038
China	-0.008	0.132
Bangladesh	-0.028	0.009

$p < 0.005$

Fig. 2 Local Indicators of Spatial Association (LISA) of immigration rates of Chinese citizens. Year 2002 and 2022



Discussion and conclusion

The spatial analysis of migration flows broken down by community offers an innovative interpretative perspective on the phenomenon of migration in Italy. Considering the spatial dimension of inflows allows us to highlight substantial differences in the territorial settlement patterns of communities that are affected by the interaction between migration networks and local conditions. The combined use of global and local spatial autocorrelation indices enables us to grasp the important and often overlooked role of space as a proxy for various territorial variables. Employing models that account for spatial autocorrelation yields more consistent statistical results. The approach adopted therefore demonstrates the potential of spatial analysis, providing important and interesting insights into the phenomenon of migration. Looking ahead, the analysis should be extended to a more detailed territorial level — such as the municipal level — in order to identify more precisely the formation and evolution of local clusters and to explore the mechanisms of interaction between space, networks and the attractiveness of territories.

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