

Spatial Approach in the Analysis of Immigrants Clusters in Urban Areas

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Only a few decades ago one of the main demographic issues in Spain, as well as in other southern European countries, was international emigration and internal rural-urban migration. Recently the socio spatial configuration of Spanish cities is going through a fast period of adaptation to a new situation with an important economic development and a major affluence of international immigration. These processes can be measured by mean of the conjunction between space and statistics using new tools and modern software based on Geographic Information Systems (GIS). The objective of the present communication are mainly three: to detect the patterns of spatial distribution of immigrants in an urban area, to analyse the socio-economic characteristics of the areas with a significant accumulation of the different immigrant groups and to select the most relevant factors to determine the existence of spatial clusters of immigrated population.

The methodology is based on spatial statistics as a basic tool, using Local Indicators of Spatial Association (LISA), and a spatial econometrics model trying to answer the question on how population cluster can be identified taking into account the geographic characteristics of an area and how to link it with the description of the socio-economic characteristics of those clusters. The theoretic exposition is complemented with a case study being the city of Barcelona. The different steps of the study can be described as follows:

Spatial autocorrelation analysis allows to distinguish between a random distribution of a variable and a situation of significant association among neighbouring areas; the results of Moran's I of local association can be directly connected to the town map through a scatterplot map showing the areas with significant over and under representation of a population group in terms of percentage of total population. Those with over representation will be considered clusters.

In order to categorize the socio-economic characteristics of the detected clusters, census information can be used and an ANOVA analysis facilitate the decision about the existence of significant differences between the clusters and the rest of urban area, e.g. the unemployment rate is higher or lower in the clusters than in the rest.

The final stage consists in the construction of an econometric model of discrete choice, namely the logit model, where the dependent variable is the status of a space unit being cluster or not, and the explanatory variables are constituted by different socio-economic attributes of the space units. As the logit model does not include the spatial effects in the specification and also presents heterocedasticity, it is essential to incorporate the spatial effects using the model proposed by Lesage (1999). In the course of a selection process at the end we obtain the relevant features to describe the characteristics of the clusters.

Regarding the case study, the data is secondary data provided by the official statistics bureau. Regarding the population it offers the information about residents divided in census tracts being the spatial dimension, as well as the details about their distribution by nationality for the year 2005. On the other hand, there is the socio-economic

information of the census tracts; we used the following variables: the unemployment rate, the level of schooling, the percentage of population with university degree, the percentage of aged over 65, the population density and the index of habitability (a composed index including different characteristics of the buildings, equipments and neighbourhood). The results show the different patterns of spatial distribution in the city of Barcelona for six aggregated immigrant groups according to their geographic origin and for the eleven largest nationalities.