

Geographical analysis of socio-demographic indicators in Europe

Analisi territoriali di indicatori demografico-sociali in Europa

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Riassunto: Il processo di integrazione europea prevede un progressivo allargamento degli stati membri fino ad un'ipotizzabile Unione a 33. Si tratta, tuttavia, di paesi molto diversi, i quali, dovranno contribuire a costruire un'Unione coesa che risponda a comuni regole economiche, giuridiche e sociali. Scopo del presente lavoro è valutare il grado di omogeneità/eterogeneità della struttura demografico-sociale dei paesi candidati, e quindi il grado di coesione della futura Unione Europea estesa fino a 33 paesi aderenti. L'analisi descrittiva dei dati, quella multidimensionale mediante ACP, per individuare le dimensioni latenti e, la classificazione mediante Cluster Analysis, consentono di rilevare sia la presenza di consistenti differenze tra i nuovi e i vecchi paesi che un discreto grado di omogeneità all'interno dei gruppi rispetto alle dimensioni esplorate.

Keywords: socio-demographic indicators, dispersion, enlargement

1. European Union Enlargement

On 10 May 2004 European Union decided to open to ten new member states, facing a unique challenge, since it is without precedent in terms of diversity: the number of candidates, the wealth of different histories and cultures, different demographic, social and economic aspects. EU membership should be soon extended to Bulgaria and Romania, while Turkey and Croatia are, at present, candidate countries. Some problems arose with Turkey, because on joining the Union, applicants are expected to accept the detailed laws and rules adopted on the basis of the EU's founding treaties, but in this country often human rights are still not respected. Thus the accession process for Turkey will be probably very long and difficult, it is not possible at the moment to estimate the length of the negotiation in advance.

Potential candidate countries are Albania, Bosnia and Herzegovina, Serbia and Montenegro, and Macedonia.

These Western Balkans countries have very different cultures and, if their application is accepted, they will have to adopt common laws and rules already shared by all the other member states. The aim of this paper is, therefore, to estimate the actual level of integration/dispersion of the socio-demographic structure of these candidate countries and the level of cohesion of the future European Union, at first with 27, then with 29 and finally with 33 member states.

2. Descriptive Analysis: dispersion of the socio-demographic structure

Recent EU enlargement is the most important of its history because of the number of the candidates and of the different cultures. If you analyse data we can see, from a demographic point of view, a homogenous group that represents «Old Europe», in which all the countries are experiencing an ageing process of their population, except for Ireland with high percentages of young people (0-14) and the highest total fertility rate of EU-15. Dispersion among 15 countries is minimum, the relative standard deviation is inferior to 0.1. On the other hand, dispersion increases in the new EU-25. Variance increases for all the demographic variables and, in particular, has its maximum level for male life expectancy at birth: in the EU with 15 members it is equal to 0.89, in the new European Union it is equal to 14.20. Moreover, with regard to life expectancy, we notice a difference by gender for the new member states, where women are advantaged.

There are no great differences among the members of EU in terms of fertility and median age at birth. Only for the latter we find a slight difference for the new countries of the enlarged Union: Lithuania has the lowest value (26.9 years).

Bulgaria and Romania's upcoming accession will not modify the present demographic situation, because these two countries are not very different from the 10 that recently got the membership. The only exception is the infant mortality rate, which is twice or three times than the member states; while the mean of infant mortality rate increases with the increasing number of members, life expectancy at birth falls both for men and women. Croatia's accession will not change the demographic structure of the Union as the prospect of future membership to Turkey, a country which is very different from the rest of Europe both for culture, tradition and demographic structure.

Total fertility rate of EU with 25 members is 1.46 children per woman, while in Turkey it is 2.46, which is higher than the threshold which allows for the replacement of each generation. Turkey's population structure shows a young population, with a percentage of people over 65 equal to 5.5%, while nowadays in the EU-25 it is equal to 15.1%. Infant mortality rate is, among all the countries, member and candidates, the highest (39.4‰). Turkey's accession to the EU will produce an increase of dispersion of the demographic indicators considered. In particular, variance of infant mortality rate is equal to 47.91 and the standard deviation is equal to 6.92.

The last group of potential candidate countries with the prospect of future membership corresponds to Western Balkans. Their accession will produce an increase of dispersion for all the demographic indicators, in particular for infant mortality rate. Among the Balkan Republics there are some differences: range is equal to 3.9, Serbia Montenegro has the highest mortality rate (13.3‰), while Bosnia-Herzegovina has the minimum (9.4‰).

There are no great differences among the members of EU and candidates in terms of total female first marriage rate. Regarding education level, the highest dispersion would be, in an hypothetical EU with 27 members, for women. High variance and standard deviation are determined in Turkey by a women literacy level, which is lower than the rest of Europe. Male literacy level in Turkey is equal to that of the rest of Europe. Dispersion is zero in «Old Europe», and minimum in the present EU, this could mean an absolute homogeneity in the literacy level of the population over 15 years old.

For what concerns economic indicators their dispersion is higher than the one of socio-demographic indicators, this means a great difference in the economy of the EU-15 and the rest of European countries. If we consider unemployment rate, for instance, the mean of the countries in the EU with 15 members is 6.5%, while for the four Balkan Republics (with the prospect of future membership) the mean is 19.7%. In our analysis if the number of countries increases, variance increases from 7.70 to 38.79. If we consider public health expenditures (% of GDP), on the contrary dispersion remains stable and the values of countries like Macedonia (5.8%) and Turkey (4.4%) are not very different from those of the countries in EU with 15 members.

3. Multidimensional analysis of the future European Union

Starting from few basic indicators, because of the shortage of available and comparable data at present, we perform a multidimensional exploration of the data, firstly, by means of Principal Component Analysis, in order to characterize the latent factors, and then, through Cluster Analysis, to produce a classification of the data. To achieve this, for PCA, a matrix was considered containing the following indicators: total fertility rate, median age at birth, % of population 65 and over, % of population 0-14, % of population 15-64, life expectancy at 65 by gender, life expectancy at birth by gender, infant mortality rate, total female first marriage rate, GNI, total debt/GDP, public health expenditure, total unemployment rate total and by gender, employment rate total and by gender, adult literacy rate by gender. Then, through a Cluster Analysis, the countries were clustered in four groups. The first cluster includes Albania; the second Bosnia and Herzegovina, Serbia and Montenegro, Macedonia, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia; the third Turkey; the fourth Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Spain, Sweden, United Kingdom, Luxembourg, Malta, Netherlands, Portugal, Slovenia.

As regards the clusters shape and their position, it should be noted, firstly, that two groups oppose: the countries included in the second cluster and those are in the fourth cluster, and, then, that are two countries *outsider*, Albania and Turkey. The socio-economic situation of the second group of countries appears serious: high unemployment rate, low employment rate and GNI, low TFT and life expectancy. Instead, the countries of the fourth cluster look to be in better living conditions: high level of life expectancy, GNI, employment rate, public health expenditure, adult literacy rate and low level of unemployment rate and infant mortality rate. The Albanian situation is very serious and different from that each one of all countries that are in the other two clusters: high unemployment rate, infant mortality rate, TFT, % of population 0-14, total female first marriage rate and low GNI. Equally, Turkey presents a critical socio-economic low-profile: high total debt/GDP, infant mortality rate, TFT, % of population 0-14, low level of life expectancy, GNI, adult literacy rate. The Turkish position, at present, is deeply different and far from the living conditions of each countries analysed.

4. Conclusions

Multidimensional analysis has showed that there are a group of countries (above all in Old Europe) which have lived all the stages of the demographic transition and now are experiencing population ageing with a very good economic situation showed by all economic indicators.

At the moment another group of countries (there are, above all, Eastern Europe countries) is experiencing the demographic transition, as we can notice from the analysed demographic indicators; but their economic condition is very far from the good performances of Old Europe countries.

Albania and Turkey show demographic and economic situations which are different from the rest of Europe, they probably derive from different cultures and traditions which produce their effects also in the socio-economic field.

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