### SCENARIOS FOR REGIONALIZATION: ANALYSIS ON ROMANIA'S POPULATION USING ONICESCU INFORMATIONAL STATISTICS

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#### Abstract

Regionalization is an important topic in Romania, as it is considered that it would help to obtain easy access to European funding and it would stimulate economic development. In order to meet this purpose, it is necessary to find the optimal formula for reorganizing Romania's territory. It was shown that the decision regarding regionalization needs to be taken considering many criteria. One of them is population. This paper aims to study the homogeneity of the Romanian regions' population, regarding age, area of residence and gender. With the help of Onicescu informational statistics it was shown that regions are homogenous from the mentioned points of view. This led to the conclusion that the decision on regionalization can only be taken after considering other aspects as well.

JEL Classification codes: C49, J10, J11, R13

Key words: regionalization, population, informational statistics, informational energy

#### Introduction

Romania's regionalization has been a continuous source for discussions in the last few years, as the process of reorganizing the territory and assigning juridical personality to the development regions created in 1998 was necessary in order to obtain easy and successful access to European funding.

As part of a more extensive research, aiming to find an optimal formula for regionalization, this paper focuses on studying the homogeneity of Romania's population in each region. In this case the similarities or the differences between regions don't matter; the similarities between the counties forming the regions are those that count here. Unlike other demographical analysis completed so far, most being descriptive, this research is made with relatively new instruments, provided by Onicescu informational statistics. The obtained results indicate a relative demographical homogeneity of the studied regions.

The first section of the paper reviews some of the demographical studies made in Romania, focusing on the important influence that the population's characteristics have on the economic development and the long term evolution of that country. The main characteristics of Romania's population were also highlighted in this section, along with the causes that led to the current situation. The second and third sections of the paper present the methodology used and the results obtained. They are followed by a conclusion and a direction of further studies.

## The role of population in development. General characteristics of Romania's population

Most of the regionalization formulas proposed for Romania so far was based on a single element, like ethnic composition, geographical location or historical importance. As showed in a previous work (Lie, Mihăiță, 2014: 1-6) this is not enough: the decision on regionalization should be taken considering a multi-criteria model.

One of the main factors that influence a country's economic development is its population, as the human resources are involved in every economic activity, they produce and consume goods and services, they pay taxes and benefit from state subsidies and from other welfare. As Bere *et al.* (2014:357-365) highlight, endogenous theories on economic growth "distinguish human capital and innovation as main factors of growth". Moreover, various demographical processes have many effects on the economy.

For example, a country with a big or growing population can be seen as a market with many opportunities for companies to develop and to diversify their business, which will attract investments and will create jobs, with positive effects for that economy. On the other hand, as Caron *et al.* (according to Şerban, A. C, 2012: 356-364) observed in 2005, aging population has direct effects , influencing on "the size and quality of employment, capital/labor ratio and technical progress", but also indirect effects, "on budgets and, thus, on the whole economy". Other consequences of this aging phenomenon are related to "changes of demand and consumption structures" (Şerban, A. C, 2012: 356-364), changes that companies need to take into consideration when planning their medium and long term activities.

For Romania, human resources are even more important, as they represent one of the country's relative strenghts in the race for innovation (European Union's Innovation Scoreboard - 2011, according to Dodescu,

A., Chirilă, L. F, 2012: 1177-1184). Since 1990, the number of Romania's inhabitants has been following a downward trend, as a consequence of "negative natural increase rates, migration and the lack of an encouraging policy towards boosting the birthrate" (Popescu, D. L., 2013: 120-127).

Besides the decrease in the number of inhabitants, our country is also experiencing a process of population aging, similar to all the European states, one of the causes beeing the law against abortion in the communist period. In fact, as Şerban (2012: 356-364) notes, demographic evolutions after 1990 are influenced by lifting the ban on contraception, "by the economic and social crisis that characterized most of this period and by entitlement to free movement".

Another of Romania's demographic characteristics is the fact that the urban population has a higher percentage of total compared to the rural population, due to the industrial development that took place in the communist era, and also to the fact that nowadays cities offer more jobs and better living conditions than rural areas (Popescu, D. L., 2013: 120-127). As a consequence, rural population experiences two processes, one of reduction and one of aging, especially since birthrate has experienced a decrease, correlated with a high rate of deaths (Popescu, D. L., 2013: 120-127).

Considering these conditions, it becomes clear that the current situation represents a real challenge: Romanian villages are heading towards extinction, having increasingly less and increasingly older inhabitants, even if, until the Second World War, most of the Romanians were employed in agriculture; the total population is also decreasing and aging, which will lead to increasingly higher budgetary burdens, and, moreover, many young people choose to emigrate.

This is the situation at a national level. In order to offer an optimal formula for regionalization we need to look at the regional level, as homogeneity at this level is required. Further the population's homogeneity in Romanian regions will be analyzed, studying the current regions, but also different other scenarios.

#### Methodology

In order to complete this analysis, instruments provided by Onicescu informational statistics, as in the calculation and properties of informational energy, were used.

The analysis is based on data referring to Romania's population available in the database Tempo Online, provided by the Romanian National Institute of Statistics. The most recent available data were chosen, those corresponding to the year 2013.

#### Data analysis

The first step of this analysis was to group data regarding Romania's population by two criteria: area of residence and age, respectively sex and age. It was followed by the calculation of the informational energies, the adjusted informational energies and the influences for each county. In the end I calculated the total energy for each of Romania's regions with their current structure.

The next step was to propose various scenarios for regionalization and compare the energies for the new obtained regions with the current ones. For these scenarios the geographical position of the counties, their history, the economic and social connections between them and the proposals made so far, especially those coming from the Romanian Academy, were taken into consideration. On the other hand we tried to cut out some of their shortcomings, like too big distances between the northernmost and the southernmost points, between the westernmost and the easternmost point, or the separation between two counties strongly connected, etc.

Southwest and Northeast regions were not modified, because we consider that their current structure meets best the criteria of cultural identity and socio-economic connections mentioned above. Their homogeneity will be checked in further investigations of other development factors.

In order to complete the analysis for each criterion considered, population was grouped on two levels. Thus, depending on the area of residence the counties were studied considering their rural and urban population, the number of males and females. The two levels chosen for age were under 40 years old, respectively above 40 years old.

Table 1 presents the results obtained when analyzing population by areas of residence and age; calculations were made for the current structure of the counties, and also for the versions we propose. Besides moving some counties from one region to another, we also suggested the creation of a new region in Southeast Romania, integrating the following counties: Tulcea, Constanța, Călărași și Ialomița. We suggested it because there are more connections between them in this scenario, due especially to the freeway A2, which crosses them.

# Informational energies and information by regions, age and area of residence

Table 1

Region	Structure	Informational energy - rural area (%)	Information -rural area (%)	Informational energy – urban area (%)	Information -urban area (%)
Northwest	Current: BH, BN, CJ, MM, SJ, SM	0.145	0.20	0.188	0.06
	Version: BH, MM, SJ, SM	0.076	0.054	0.2611	0.036
West	Current: AR, CS, HD, TM	0.0086	0.703	0.00097	0.035
	Version: AR, CS, TM	0.032	0.322	0.00493	0.014
Center	AB, BV, CV, HR, MS, SB	0.413	0.247	0.0128	0.0183
	Version 1: AB, BV, CV, HR, MS, SB, CJ, BN	0.26	0.284	0.029	0.042
	Version 2: AB, BV, CV, HR, MS, SB, HD	0.183	0.673	0.0128	0.0362
	Version 3: AB, BV, CV, HR, MS, SB, CJ, BN, HD	0.260	0.284	0.029	0.042
Southeast	Current: BR, BZ, CT, GL, TL, VN	0.024	0.474	0.014	0.0735
	Version: BR, BZ, CT, GL, TL, VN	0.004	0.303	0.039	0.106
South Muntenia	Current: AG, CL, DB, GR, IL, PH, TR	0.122	0.315	0.022	0.113
	Version: AG, DB, GR, PH,TR	0.161	0.370	0.05	0.109
New region in the Southeast	CL, CT, IL, TL	0.096	0.414	0.002	0.01

Source: Excel calculations based on data from database Tempo Online.

As it can be seen in the table, informational energies and information obtained for the current structures are generally similar to those for the versions proposed; in most of the cases these values don't exceed 0.5%, which means that the regions are relatively homogeneous regarding the population. These results can be explained by the demographical evolutions in the last half of century, very similar all over the country: during the communist age the industry developed in all counties, determining a massive migration from villages to cities, and after 1990 the economic and social crisis affected all the country, so there were no developments significantly different from region to region or from county to county.

Calculations made considering age and sex led to similar results, which means that from a demographical point of view Romania's regions are rather homogeneous. A decision regarding the optimal formula for regionalization cannot be taken based on the information obtained this way. In order to make a decision it is necessary to also consider other aspects, like indicators from industry, agriculture, commerce, etc.

#### Conclusions

To conclude, Romania needs a formula for territorial organization corresponding to level NUTS 2, and as population is one of the essential factors for development, it was necessary to study it at a regional level.

By means new methods, provided by informational statistics, we proposed several regionalization versions and we tested, in different scenarios (current structure of the regions and proposed versions), the homogeneity of those regions.

The result is that regions in Romania are quite homogenous in terms of population, in both current and proposed versions, which means that the decision regarding the optimal structure will be taken considering other criteria, which are the subject of my further research.

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