THE STATISTICAL DISPARITIES IN EDUCATIONAL AND DEVELOPMENT STRUCTURES IN TERRITORIAL PROFILE IN ROMANIA

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Abstract

Regional disparities in labor productivity basically explain regions` divergent development path. Education and specialization of labor force are key factors, which are nowadays changing rapidly and have an impact on development. Improved education is usually regarded as a source of productivity increase. The specialization of regions in traditional activities, such as subsistence agriculture, keeps a higher employment rate, but low productivity. During the empirical analysis, we used a series of regression and correlation methods, econometric tests to highlight the link, degree of intensity, and the relationship between education and growth through the use of the Pearson correlation coefficient. Territorial analysis of the employment of less educated people compresses important issues regarding territorial disparities in economic welfare. In particular, the analysis of education in Romania comprises two aspects (in the territorial and European regional context), each of which is structured according to the indicators survey: education level, gross domestic product, adult participation in lifelong learning, employment and the salary level based on information from the Population and Housing Census by making statistical correlations and interpretations.

Key words: *regional economic development, territorial disparities, statistical disparities, level of education*

JEL Classification: *I25, I24, R10, P24*

I. INTRODUCTION

The causes of geographical disparities have been analyzed in most of the regional sciences theories, which have attempted to provide answers to the question of why some regions stand out faster than others. Explanations are numerous and consistent with the reference period. Treiman and Yip (1989), in a comparative study in 21 countries, found that education was a strong determinant of occupational status in more industrialized countries. In particular, in the last two decades, the analysis of regional disparities has become really important, especially in increasing the number of empirical studies on convergence (Rey S., Janikas M. 2005). Analysts, theorists and practitioners have also used the concept of disparity (discrepancy, inequality, imbalance) to express the identified differences by means of appropriate mathematical techniques using specific indicators. Education and labor force specialization are key factors that change very quickly nowadays and have a major impact on social and economic development.

II. INTERVENTION CHANGES IN THE POPULATION STRUCTURE BY EDUCATION LEVEL

The results of the 2011 census show a decrease in the share of illiterate people in the total population of 10 years and over, as compared to the 2002 census.
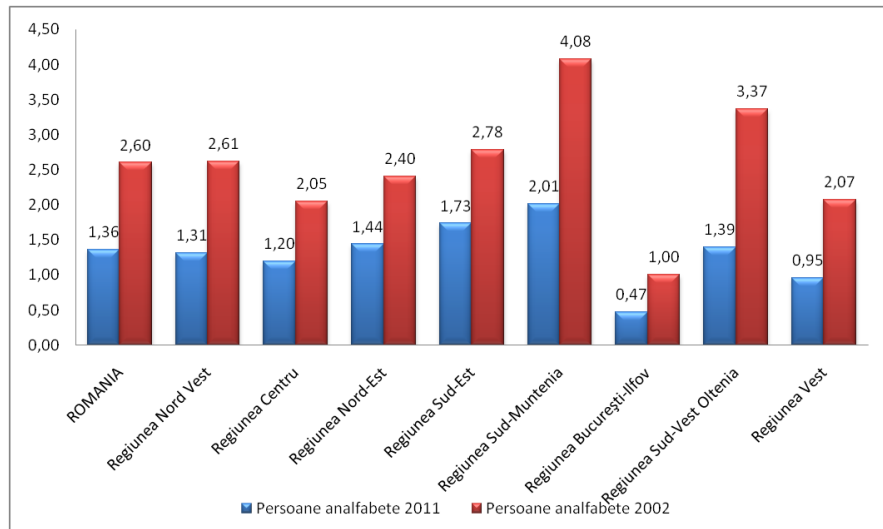
Figure no. 1. The share of the illiterate population in the total population stable for 10 years and over at censuses
Source: own development

At the level of Romania, the number of illiterate people represents only 1,36% of the total stable population of 10 years and over, decreasing from 2,60% in 2002. The highest share (2,01%) of illiterate persons is found in the South-Muntenia Region. The number of illiterate people in the South Muntenia Region has fallen by half compared to the 2002 census. The smallest share of illiterate people is actually in the most developed region of the country, Bucharest-Ilfov.

The share of illiterate population in the total population of 10 years and over in the North-East Region was 1,44% in 2011, down from 2,40% in 2002.

III. REGIONAL DISPARITIES AND TERRITORIAL PROFILE ON THE LEVEL OF POPULATION EDUCATION

The European Commission report entitled "Attention to Differences - the EU's inequalities in education" highlights the fact that there are important differences between the regions of the European Union regarding the level of education achieved.

The report is based on data from Eurostat and contains over 100 maps that allow the visualization of regional disparities. The most important findings of the report are:

• regional disparities in education hinder economic growth and balanced regional development;
• regional disparities in education give rise to inequalities between EU regions;
• the nature, scale and effects of educational inequalities vary considerably between EU regions;
• efficient use of European structural funds can help reduce regional disparities in education and their effects;
• a more systematic collection of data at subregional level is needed to improve the knowledge base and inform policy makers on this subject.
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III.1. Regional disparities in the level of population education

According to the European Commission Report entitled "Attention to Differences - EU Regions' inequality in terms of education", the regions with the highest share of people who have attained at least one form of pre-school, primary and lower secondary education (0-2, ISCED 2011) as% of the population aged over 15 is generally found in Portugal and Spain.

Table no.1 Share of persons who have promoted at least one form of preschool, primary and gymnasium

REGION	WEIGHT
Alentejo (PT)	78,4
Centro (PT)	78,2

Norte (PT)	77,7
Malta (MT)	74,2
Algarve (PT)	71,7
Extremadura (ES)	67,4
Ciudad Autónoma de Melilla (ES)	65,0
Castilla-La Mancha (ES)	64,8
Lisboa (PT)	64,5
Ionia Nissia (EL)	64,1

Source: Mind the Gap - education inequality across EU regions, http://europa.eu/rapid/press-release_IP-12-960_ro.htm

The Alentejo region of Portugal has the highest proportions of low-skilled people. According to the same Report as I mentioned earlier, the regions with the highest share of persons with a qualification obtained in university education (levels 5-6, ISCED 2011) as% of the total number of persons aged 15 and over are presented in table no. 2:

Table no. 2 Share of persons with a qualification obtained in university education

REGION	WEIGHT
Inner London (UK)	41,8
Prov. Brabant Wallon (BE)	38,1
Stockholm (SE)	34,5
País Vasco (ES)	34,3
Prov. Vlaams-Brabant (BE)	34,1
Utrecht (NL)	34,1
Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE)	33,9
Île de France (FR)	33,0
Noord-Holland (NL)	32,8
Hovedstaden (DK)	32,3

Source: Mind the Gap - education inequality across EU regions, http://europa.eu/rapid/press-release_IP-12-960_ro.htm

The regions with the highest share of university graduates are mostly in the United Kingdom, Belgium, France and Denmark. In Romania, following the centralization of the results from the 2011 census, the share of graduates in higher education is 14,38% of the total stable population of 10 years and over. The region with the highest share (30,8%) is Bucharest -Ilfov, and the lowest share of university graduates is in the North-East region (10,22%).
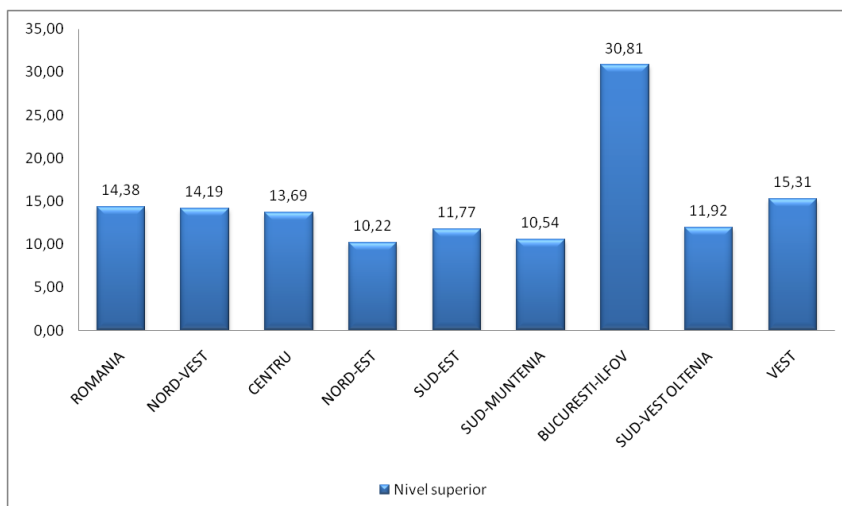

Figure no. 2 The share of graduates in the census in 2011
Source: own development

There are very large discrepancies between the Bucharest-Ilfov Region and the other regions. Only 15.31% of the stable population of 10 years and over in the West Region has superior southern seas.

III.2. Territorial disparities regarding the level of education of the population

In territorial terms, on the counties we find that there are very large differences between the city of Bucharest and the other counties of the countries. In Bucharest, over 33% of the population has higher education,

while in Giurgiu County only 6,80% of the county's population has undergone a form of university education.
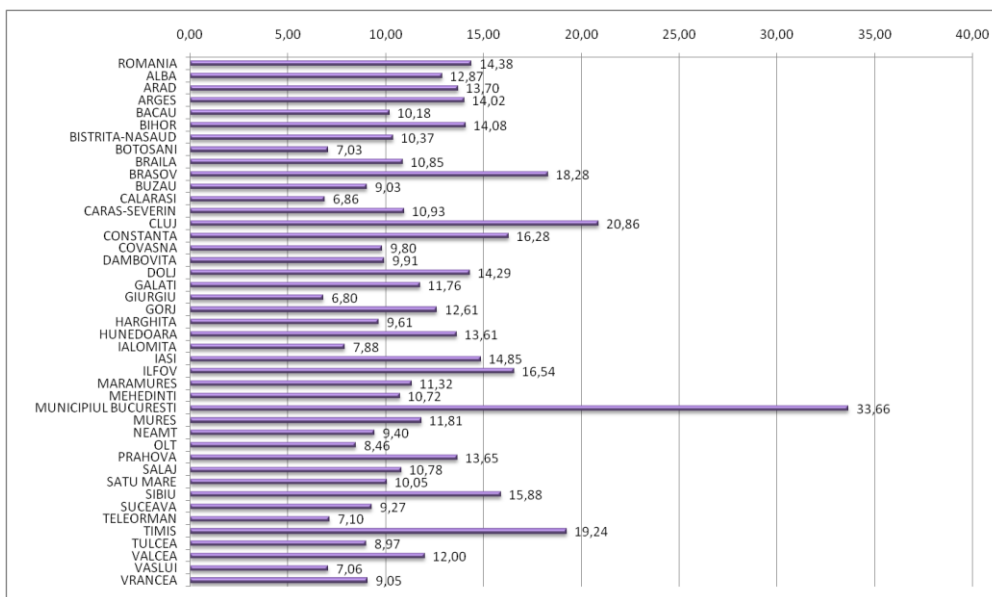

**Figure no. 3 Share of the stable population of 10 years and over with higher education, by counties
at the 2011 census**
Source: own development

In Suceava County, the proportion of those who have completed higher education in the total population of 10 years and over is quite low. Only 9,27% had a higher education diploma in 2011.

Regarding the number of illiterate persons, the counties with the highest shares are: Giurgiu (4,02%), Călărași (3,60%) and Ialomița (3,33%). These are in fact counties with a low level of economic development.
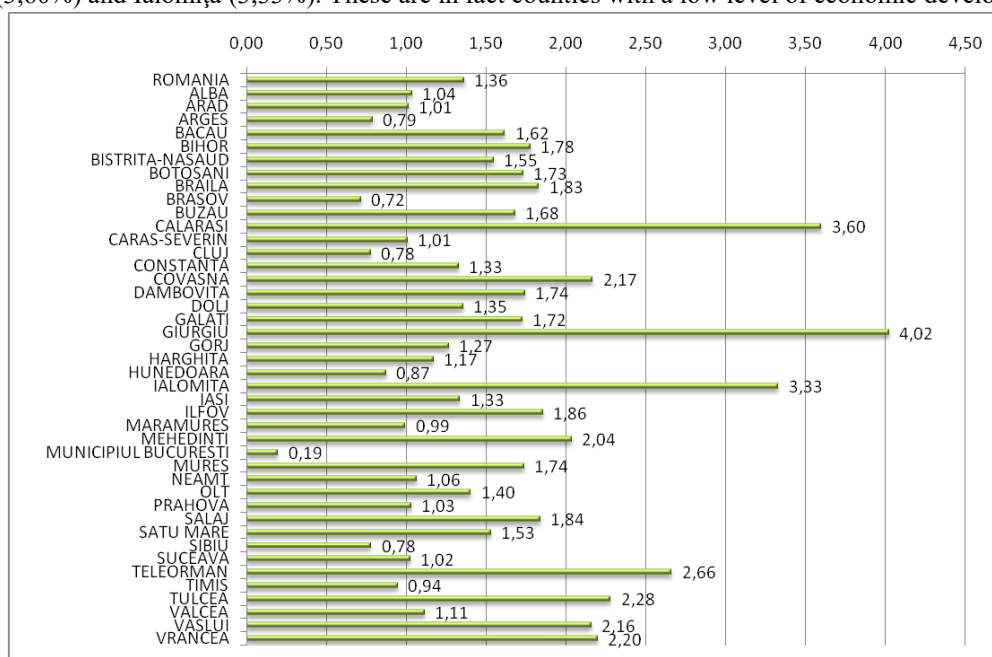

Figure no. 3 The share of the illiterate population in the total stable population of 10 years and over
Source: own data production

The lowest weights of illiterate people are in Bucharest (0,19%), Brasov (0,72%), Cluj (0,78%) and Sibiu (0,78%), areas with a high level of development economic.

III.3. Differences in adult participation in lifelong learning

Switzerland and Denmark have the highest share (31,7%) in the population aged 25-64 who is involved in lifelong learning activities. Followed by Sweden (28,9%), Iceland (25,9%) and Finland (25,1%).

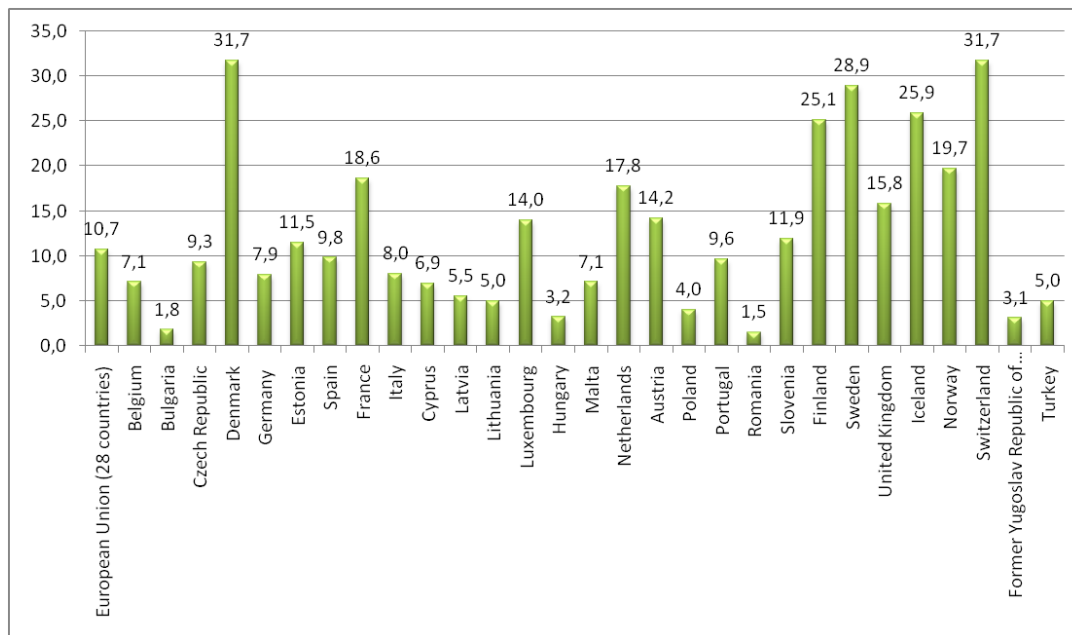The weakest results are recorded in Romania (1,5%) and Bulgaria 1,8%.

Figure no. 4 Participation of adults aged between 25 and 64 years in education and training activities in 2014
Source: own data production http://ec.europa.eu/eurostat/data/database

On regions in the European Union, we see that the regions with the largest participation of adults aged 25-64 in education and training activities (as a % of the total population) in 2014 are in Switzerland, Denmark and Sweden.

Table no. 3 Participation of adults between 25 and 64 years of age in education and training activities in 2014

REGION	2014
Zürich (Switzerland)	35,9
Hovedstaden (Denmark)	35,8
Nordwestschweiz (Switzerland)	33,5
Zentralschweiz (Switzerland)	33,1
Denmark (Denmark)	31,7
Switzerland (Switzerland)	31,7
Schweiz/Suisse/Svizzera (Switzerland)	31,7
Stockholm (Sweden)	31,5
Midtjylland (Denmark)	31,1
Espace Mittelland (Switzerland)	31,1

Source: own data production http://ec.europa.eu/eurostat/data/database

For the regions with the lowest participation of adults aged between 25 and 64 in education and training activities (as% of the total population), it is observed that most of them are from Romania, Bulgaria and Greece.

Table no. 4 Participation of adults between 25 and 64 years of age in education and training activities in 2014

REGION	2014
Severna i yugoiztochna Bulgaria (BG)	1,1
Peloponnisos (NUTS 2010)	1,1
Severen tsentralen (BG)	1,0
Yugoiztochen (BG)	1,0
Nord-Vest (Romania)	0,9
Macro-region one (Romania)	0,8
West (Romania)	0,8
Center (Romania)	0,7
Macro-region four (Romania)	0,7
South-West Oltenia (Romania)	0,7

Source: own data production http://ec.europa.eu/eurostat/data/database

The South-West Oltenia Region in Romania has the lowest share of adults participating in the lifelong learning process.

IV. RELATIONSHIPS IN EMPLOYMENT LEVEL, POPULATION EMPLOYMENT AND ECONOMIC DEVELOPMENT BY REGION AND TERRITORIAL PROFILE

IV.1. Payroll by region and territory

In Romania, the monthly average nominal earnings per month was 2163 lei in 2013. The only region in Romania that exceeded this average value is Bucharest-Ilfov. The lowest monthly gross nominal earning (1808 lei) was registered in the North-East region.
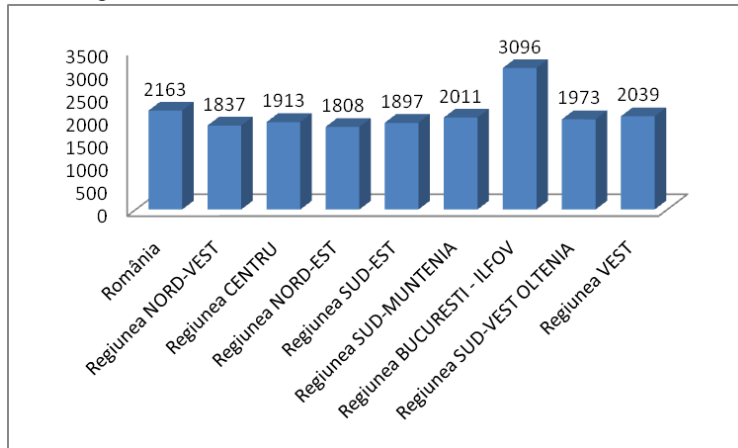

Figure no. 5 Gross average monthly nominal earnings per development region in 2013
Source: own development

In the territorial aspect, the highest monthly average nominal earnings per month was registered in Bucharest (3148). It follows in descending order: Ilfov county (2695 lei), Timiş (2324 lei) and Cluj (2287).
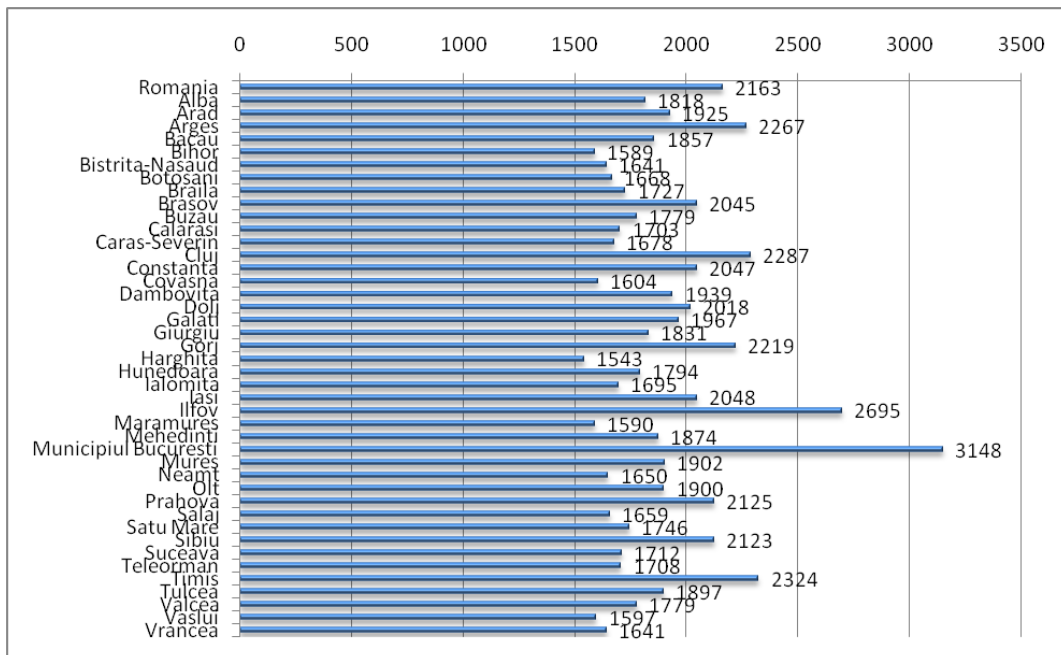

Figure no. 6 Gross monthly nominal earnings per county in Romania in 2013
Source: own development

The lowest gross monthly nominal earnings per month were registered in Harghita County (1543 lei), followed by Bihor (1589 lei).

IV.2. Regional and Territorial Employment

In Romania, the employment rate in 2013 was 60,9%. By region, the highest employment rate is in the Bucharest-Ilfov region (82,1%), and the lowest in the North-East region (49,6%).

Table no. 5 Employment rate of labor resources by development regions in 2013

MACROREGIONS, DEVELOPMENT REGIONS	YEAR 2013 (PERCENTAGE)
Romania	60,9
NORD-WEST Region	66,9
CENTRAL Region	62,8
NORTH-EAST Region	49,6
SOUTH-EAST Region	54,5
SOUTH-MUNTENIA Region	56,5
BUCHAREST – ILFOV Region	82,1
SOUTH-WEST OLTENIA Region	58,1
WEST Region	66,2

Source: www.insse.ro

In territorial terms, the highest employment rate is in Bucharest (85,3%), and the lowest in Bacau County (44,3%).
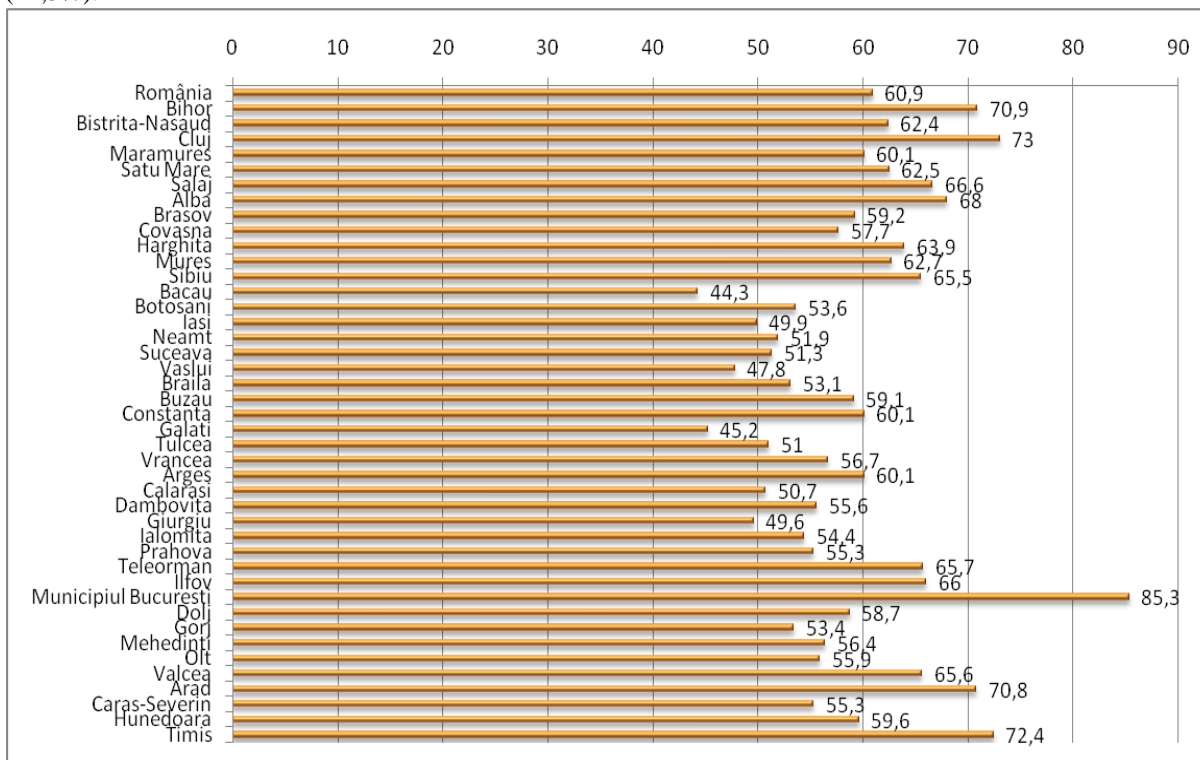

Figure no. 7 Employment rate of labor resources by counties in Romania in 2013
Source: own development

In Suceava County, only 51,3% of the labor resources are occupied. Among the counties with low values of employment rate are: Galati (45,2%), Vaslui (47,8%) and Giurgiu (49,6%).

IV.3. Gross domestic product per capita by region and territorial profile

Gross domestic product per capita was in 2012 in 2012, of 26.635,35 lei / seat. The Bucharest-Ilfov region has the highest gross per capita product (70.799,6 lei / seat). The lowest Gross Domestic Product per capita is in the North-East region (18.591,8 lei).
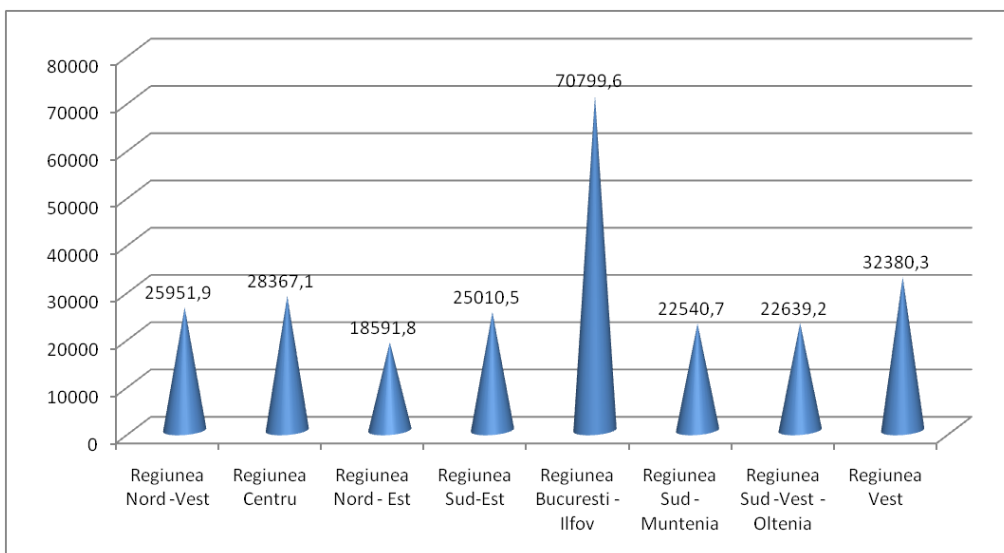
Figure no.8 Gross Domestic Product per inhabitant by regions in Romania in 2012
Source: own development

At the territorial level, Bucharest Municipality has a GDP / place of 66673,2 lei / place, followed by Ilfov County with 51983,85 lei. The big difference is Timis County with 36610,71 lei / seat.
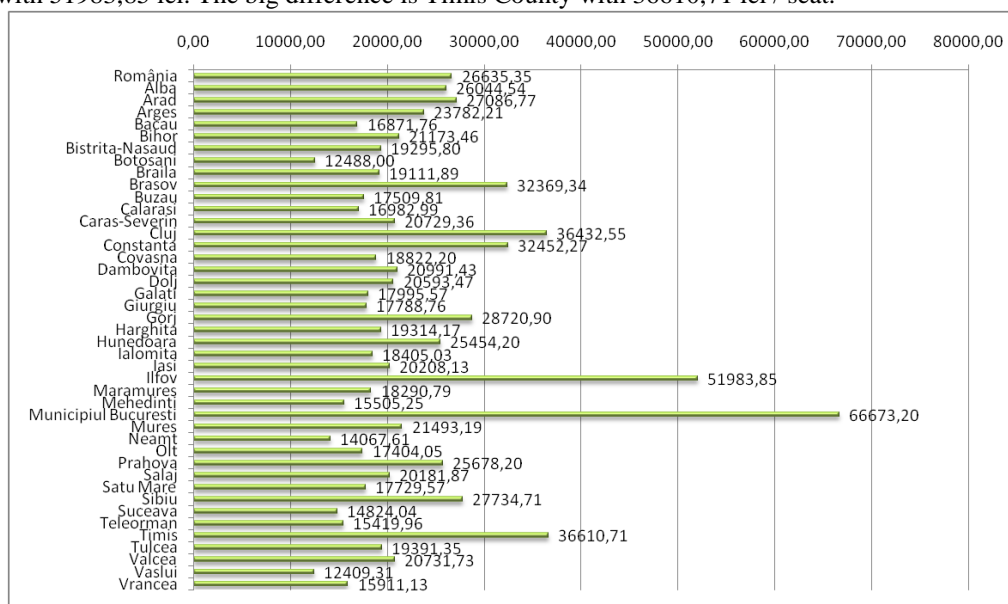

Figure no. 9 GDP by macroregions, development regions and counties 2012
Source: own development

The lowest gross domestic product per capita is in Vaslui County (12.409,31 lei / place), followed by Botosani County (12.488 lei / place), both counties being part of the North-East region.

IV.5. The correlation between the level of education and the degree of economic development in the territorial profile

An area with a low education population is a hindrance to the economic development of the area, as a low level of development can not provide the resources needed to raise the level of training.

The representation in the same axle system of pairs of numbers corresponding to the share of the population with higher education and gross domestic product per capita in the 42 counties of the country, including Bucharest, highlights a strong correlation of values.
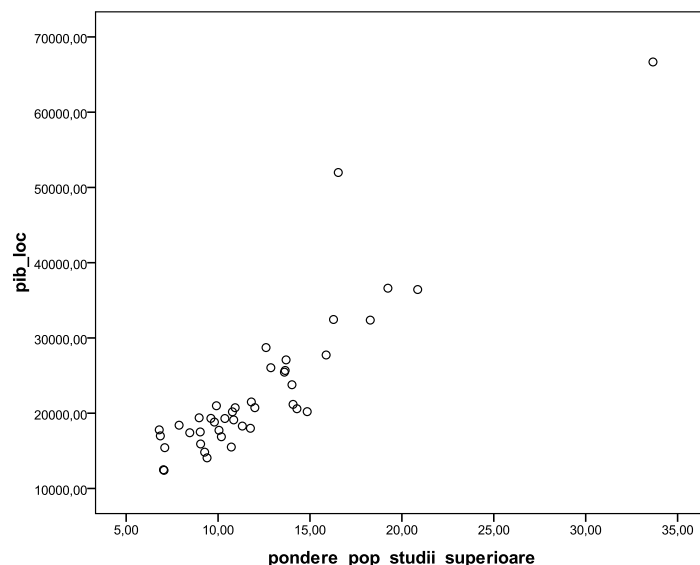
Figure no. 10 The correlation between the share of the population with higher education and the Gross Domestic Product per capita in Romania, in territorial aspect

Following the application of the Pearson correlation coefficient, a statistically significant value of 0.904 was obtained. The coefficient shows that there is a very strong correlation between *gross domestic product per capita and the proportion of the population with higher education.*

Table no. 6 The correlation between GDP / place and the share of the population with higher education

		weight_place_higher_education	GDP_place
weight_place_higher_education	Pearson Correlation	1	0,904**
	Sig. (2-tailed)		,000
	N	42	42
GDP_place	Pearson Correlation	,904**	1
	Sig. (2-tailed)	,000	
	N	42	42

** Correlation is significant at the 0.01 level (2-tailed).

Calculation of the Pearson correlation coefficient when considering the weight of the illiterate, results in a statistically significant 0,439 negative value showing that there is an inverse link between the two variables considered. Thus, we can say that as a higher level of economic development is registered, the share of the illiterate population decreases. In counties where there is a high illiteracy ratio, gross domestic product per capita is low.

Table no.7 The correlation between Gross Domestic Product per capita and the share of illiterate people

		GDP_place	Illiterate_weight
GDP_place	Pearson Correlation	1	-0,439**
	Sig. (2-tailed)		0,004
	N	42	42
Illiterate_weight	Pearson Correlation	-0,439**	1
	Sig. (2-tailed)	0,004	
	N	42	42

** Correlation is significant at the 0.01 level (2-tailed).

Given that the Gross Domestic Product per capita variable depends on the share of the higher education population and the proportion of illiterate people, the Pearson correlation ratio for the linear regression model is 0,920. The non-termination coefficient is 0,846, and the adjusted 0,838. The regression model explains in 84,6% the variation of the Gross Domestic Product per capita variable.

Table no. 8 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,920[a]	0,846	0,838	4122,14867

a. Predictors: (Constant), illiterate_weight, weight_place_higher_education

The Pearson correlation ratio is statistically significant, with the F test having the value of 106,762, the Sig value. less than 0,01.

Table no.9 ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,628E9	2	1,814E9	106,762	,000[a]
	Residual	6,627E8	39	1,699E7		
	Total	4,291E9	41			

a. Predictors: (Constant), illiterate_weight, weight_place_higher_education
b. Dependent Variable: GDP_place

Coefficients of the linear regression model were calculated using SPSS22 and are centralized in the following table:

Table no 10 Coefficiency[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-8599,974	3483,629		-2,469	,018
	weight_place_higher_education	2214,026	172,450	1,042	12,839	,000
	illiterate_weight	2890,831	1069,102	,220	2,704	,010

a. Dependent Variable: GDP_place

The linear regression model can be written as follows:

$$GDP = -8599,974 + 2214,026 * Pond_s + 2890,831 * Pond_a$$

V. CONCLUSION

As a result of the analysis carried out at the level of the 42 counties, including Bucharest, we found that there are very large differences between the city of Bucharest and the other counties of the countries. In Bucharest, over 33% of the population has higher education, while in Giurgiu County only 6,80% of the county's population has undergone a form of university education. In Suceava County, the proportion of those who have completed higher education in the total population of 10 years and over is quite low. Only 9,27% had a higher education diploma in 2011.

Regarding the number of illiterate persons, the counties holding the highest shares are: Giurgiu (4,02%), Călăraşi (3,60%) and Ialomiţa (3,33%). These are in fact counties with a low level of economic development. The lowest weights of illiterate people are in Bucharest (0,19%), Brasov (0,72%), Cluj (0,78%) and Sibiu (0,78%), areas with a high level of development economic.

Bucharest Municipality has a GDP / place of 66673,2 lei / place, followed by Ilfov County with 51983,85 lei. The big difference is Timis County with 36610,71 lei / seat. At the same time, the lowest gross domestic product per capita is in Vaslui county (12.409,31 lei / place), followed by Botosani County (12.488 lei / place), both counties being part of the North-East region.

The representation in the same axle system of the number pairs corresponding to the share of the population with higher education and the gross domestic product per capita in the 42 counties of the countries including Bucharest, has highlighted a strong correlation of values. Following the application of the Pearson correlation coefficient, a statistically significant value of 0,904 was obtained. The coefficient indicates a very strong correlation between gross domestic product per capita and the proportion of the population with higher education. The calculation of the Pearson correlation coefficient, considering the illiterate share, led to a statistically significant 0,439 negative figure showing that there is an inverse relationship between the two variables considered. Thus, we can say that as a higher level of economic development is registered, the share of the illiterate population decreases. In counties where there is a high illiteracy ratio, gross domestic product per capita is low.

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