Regional Approach to Education across the European Union

Romeo-Victor Ionescu[1]

Abstract: The paper points out the great disparities between EU Member States related to education. The analysis covers NUTS1 and NUTS2 regions and uses the latest official statistical data. This analysis is focused on seven representative indicators: pupils and students in all levels of education; participation rate of 4-years-old in education; pupils and students in upper secondary and post-secondary non-tertiary education; students in tertiary education; tertiary educational attainment; pupils in primary and lower secondary education; and early leavers from education and training. The scientific approach is built on two levels: a comparative analysis and a regression analysis, in order to quantify trends, levels and disparities in education. A distinct part of the paper deals with Romanian educational system. The main conclusion of the paper is that the educational system supports the regional disparities across the EU. Unfortunately, there are not solutions in decreasing these disparities on short and medium terms.

Keywords: regional educational system; regional disparities; leavers from education and training.

JEL Classification: R10; R19; R59

1. General Approach

Everywhere where education was desecrated, the public administration received a fateful blow (Aristotle, 1st century).

Nowadays, this approach has the same value and points out the importance of the education in achieving economic and social welfare.

European Union is focused on education as one of its most important goals. Even the Europe 2020 Strategy points out that one of its targets covers reducing school drop-out rates below 10% while at least 40% of 30-34–year-olds completing third level education (European Commission, 2010).

[1] Professor, PhD, Dunarea de Jos University Galati, Faculty of Legal, Social and Political Sciences, Romania, Address: 47 Str. Domnească, Galati, Romania, Tel.: +40336 130 108, Corresponding author: romeo.ionescu@ugal.ro & Prime-Vice-president of the Romanian Regional Science Association (RRSA); Member of the European Regional Science Association (ERSA); Member of the Regional Science Association International (RSAI).

Even the Treaty on the functioning of the European Union pointed out the need of quality education across the EU (European Union, 2012).

A report of the European Commission and Parliament defined the priority areas in education up to 2020:

- "relevant and high-quality knowledge, skills and competences developed throughout lifelong learning, focusing on learning outcomes for employability, innovation, active citizenship and well-being;
- inclusive education, equality, equity, non-discrimination and the promotion of civic competences;
- open and innovative education and training, including by fully embracing the digital era;
- strong support for teachers, trainers, school leaders and other educational staff;
- transparency and recognition of skills and qualifications to facilitate learning and labour mobility;
- sustainable investment, quality and efficiency of education and training systems" (European Union, 2015).

On the other hand, education is the responsibility of each Member State. The common approach on education has not positive impact without national support. And this support consists of dedicated policies and financial resources.

Financial resources for education lead to great disparities not only between Member States. Greater disparities are those between the European regions.

2. Research Methodology

The analysis in the paper is based on the following indicators: pupils and students in all levels of education; participation rate of 4-years-old in education; pupils and students in upper secondary and post-secondary non-tertiary education; students in tertiary education; tertiary educational attainment; pupils in primary and lower secondary education; and early leavers from education and training.

The statistical data are the latest official ones and cover NUTS 1 and 2 regions. It was very difficult to obtain data at regional level.

Moreover, the analysis is built on two steps. The first is a comparative analysis of the best ranked regions from each Member States related to a specific education indicator.

The second step deals with quantifying regional disparities related to educational process. The dispersion analysis was realized using the regional levels of each indicator as dependent variable and time as independent variable, as well. Regression covers ANOVA conditions.

3. Regional Approach on Education

The first indicator took into account is pupils and students in all levels of education. The analysis covers NUTS 2 regions and leads to the following results (see Figure 1).

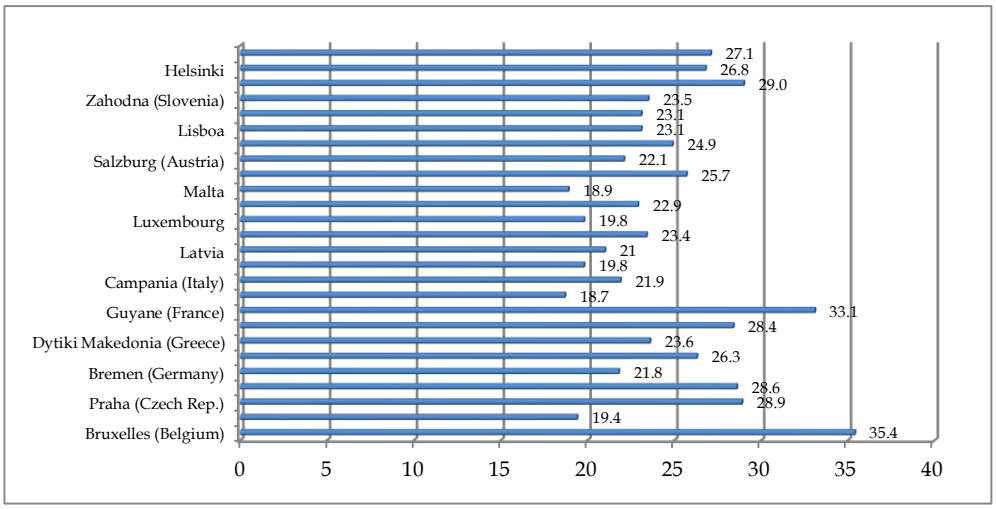

Figure 1. Pupils and students in all levels of education by NUTS 2 regions (% of total population)

16 regions in Figure 1 faced to education rates lower that 25% of total population (European Commission 1, 2017). Only two regions achieved education rates greater than 30%. The lag between the best (Bruxelles) and the worst (Jadranska Hrvatska) education rates is 1: 1.9.

In order to point out the regional disparities related to this indicator, regression analysis leads to interesting conclusions (see Figure 2).

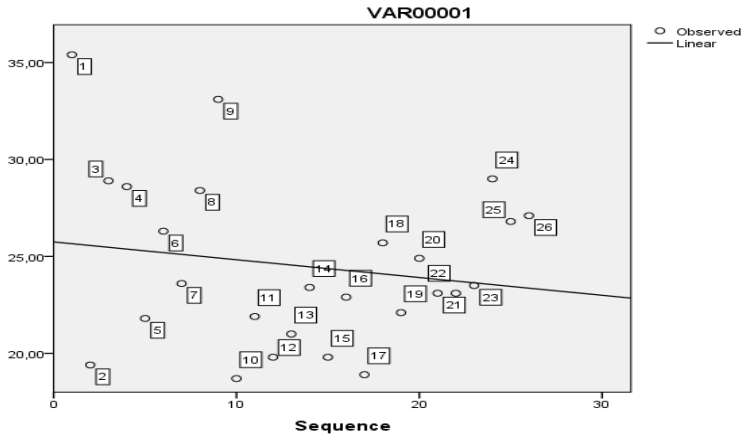

Figure 2. Regional disparities for pupils and students in all levels of education

The marks in Figure 2 are in accordance to the position of the regions from Figure 1. According to Figure 2, two clusters can be built.

Education has to be implemented as soon as possible. This is why the younger people started their education development very early. In order to point out this aspect, the EU official statistics take into consideration participation rates of 4-years-olds in education (European Commission 2, 2017).

In order to maintain representativeness, the same NUTS 2 regions are presented in Figure 3. According to this figure, the maximum ratio between the worst (Bucuresti-Ilfov) and the best (Ciudad Autonoma de Melilla) regions related to 4-years-olds in education is 1: 1.63.

On the other hand, four regions achieved education rates greater than 100%.

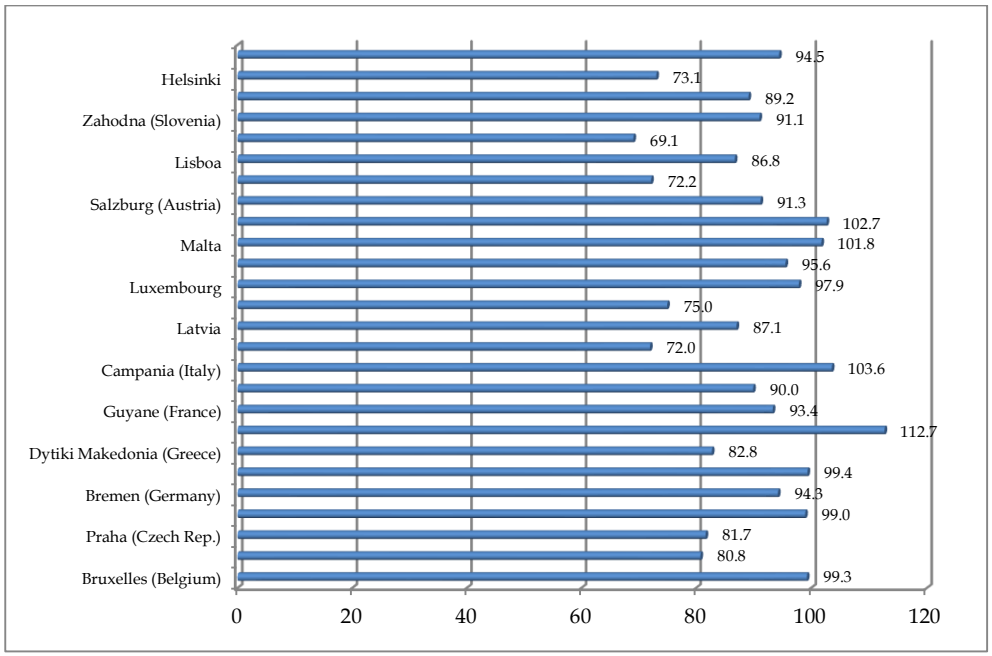

Figure 3. Participation rates of 4-year-olds in education by NUTS 2 regions (% of all 4-years-olds)

Regression leads to the same two clusters approach in Figure 4. It is very interesting that the two clusters' structure is 61.5% the same for the first two education indicators.

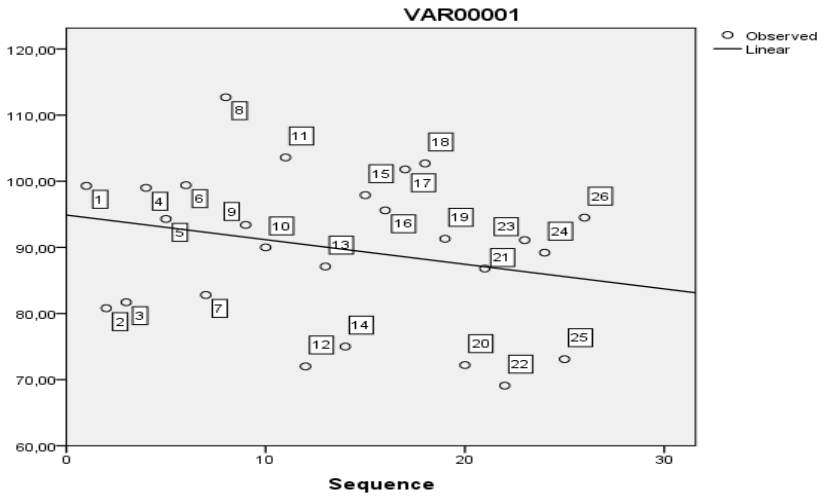

Figure 4. Regional disparities for 4-years-olds in education

The third indicator put into account is pupils and students in upper secondary and post-secondary non-tertiary education (European Commission 3, 2017). This new indicator leads to greater disparities across the selected NUTS 2 regions (see Figure 5).

According to Figure 5, the gap between Cyprus and Bruxelles is 1: 3.03. Four NUTS 2 regions faced to pupils and students in upper secondary and post-secondary non-tertiary education rates less than 30%.

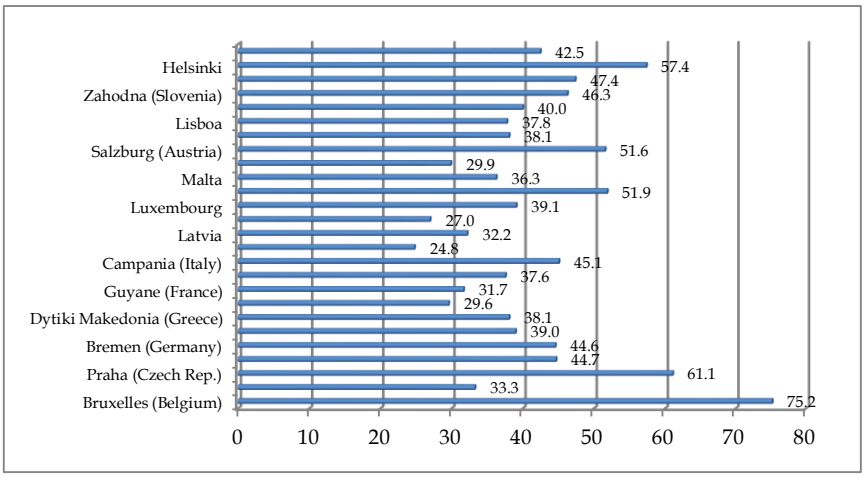

Figure 5. Pupils and students in upper secondary and post-secondary non-tertiary education by NUTS 2 regions (% of population aged 15-24 years)

On the other hand, the above indicator supports the idea of dividing the representative NUTS 2 regions from this paper into the "classic" two clusters, as in Figure 6.

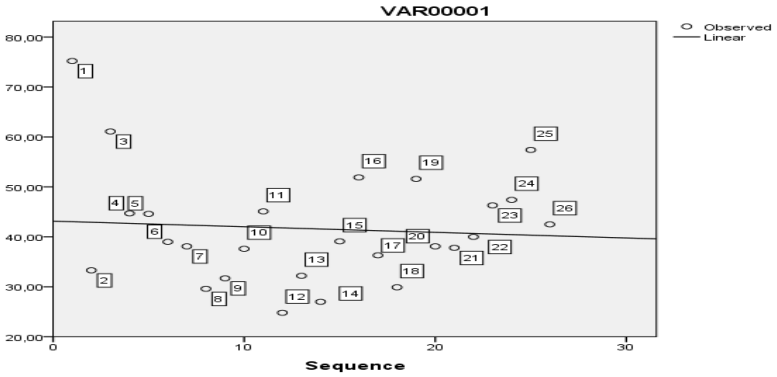

Figure 6. Regional disparities for pupils and students in upper secondary and post-secondary non-tertiary education

Even after the third education indicator the two clusters' initial structure is still representative.

A very important education indicator is students in tertiary education at regional level. There are seven regions with achieved rates higher than 100% related to this indicator (see Figure 7).

As a result the ratio between the bottom (Guyane) and the top (Bratislavsky Kraj) values of this indicator is huge 1: 14.5 (European Commission 4, 2017).

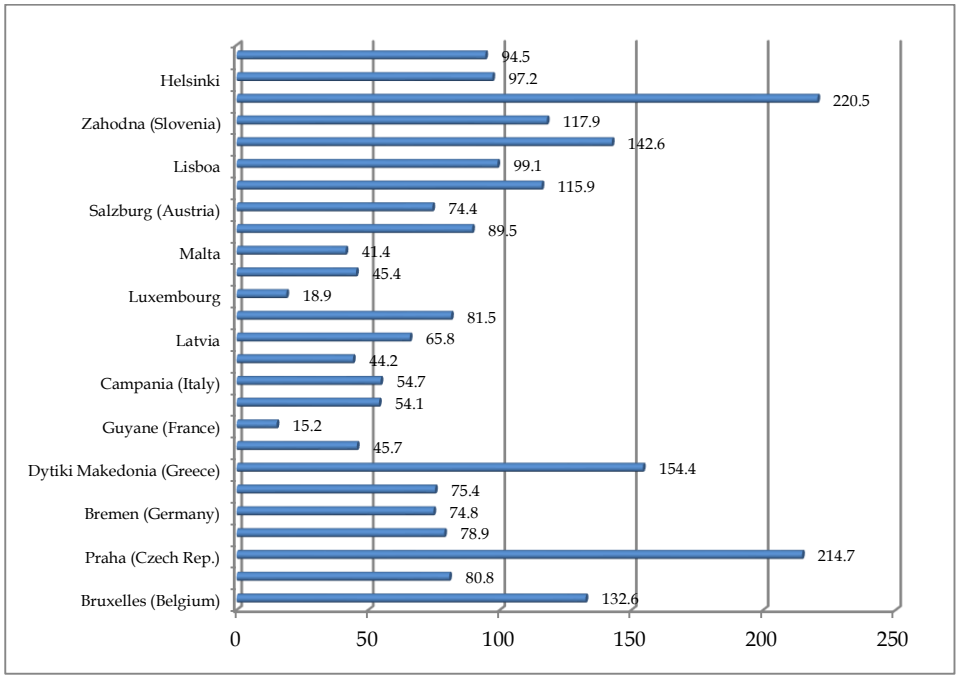

Figure 7. Students in tertiary education by NUTS 2 regions (% of population aged 20-24 years)

The regional disparities related to students in tertiary educations are the greatest till now (see Figure 8).

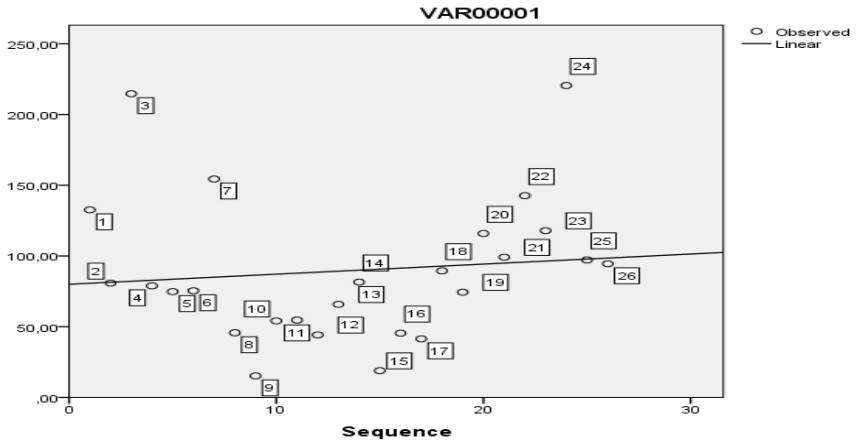

Figure 8. Regional disparities for students in tertiary education

Figure 8 points out with no doubt the two clusters approach in the analysis.

In order to analyze tertiary educational attainment, the analysis has to move to NUTS 1 regions. This approach is useful in order to describe once again the regional educational disparities (see Figure 9).

A gap of 1: 2.19 between the worst (Alfold es Eszak) and the best (Lithuania) ranked NUTS 1 regions is good enough to quantify the regional educational disparities across the EU connected to this indicator.

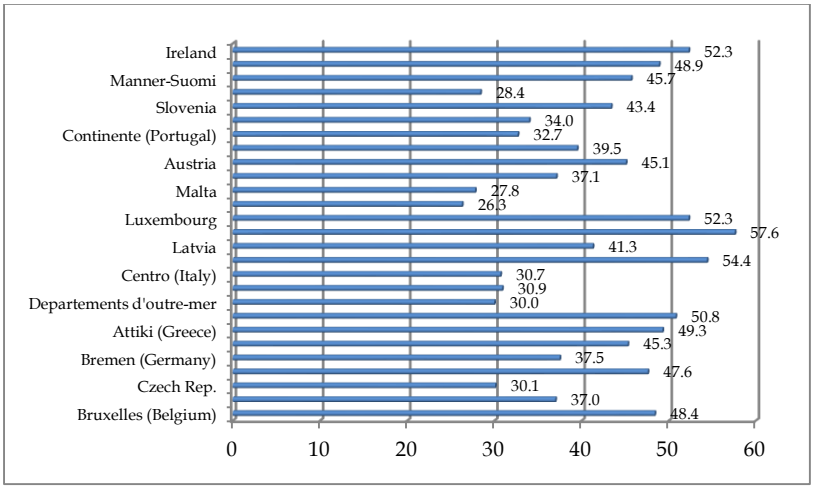

Figure 9. Tertiary educational attainment, age group 30-34 by NUTS 1 regions (% of total)

Moreover, regression supports the above idea of great regional disparities and the two clusters approach, as well (see Figure 10). The regions from Figure 10 are the same as in Figure 9 (European Commission 5, 2017).

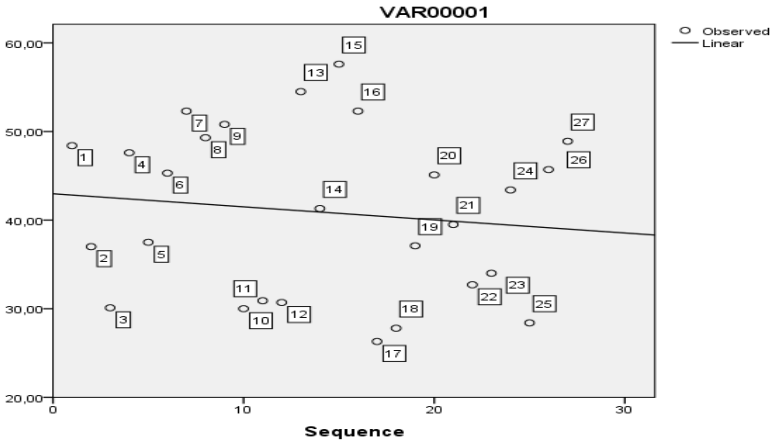

Figure 10. Regional disparities for tertiary educational attainment by NUTS 1 regions

The 6th educational indicator is pupils in primary and lower secondary education. The analysis is realized on NUTS 2 regions and leads to Figure 11.

The greatest value of the indicator was achieved in Guyane, while the lowest in Yugozapaden. As a result, the lag between these two values is 1: 3.38 (European Commission 6, 2017).

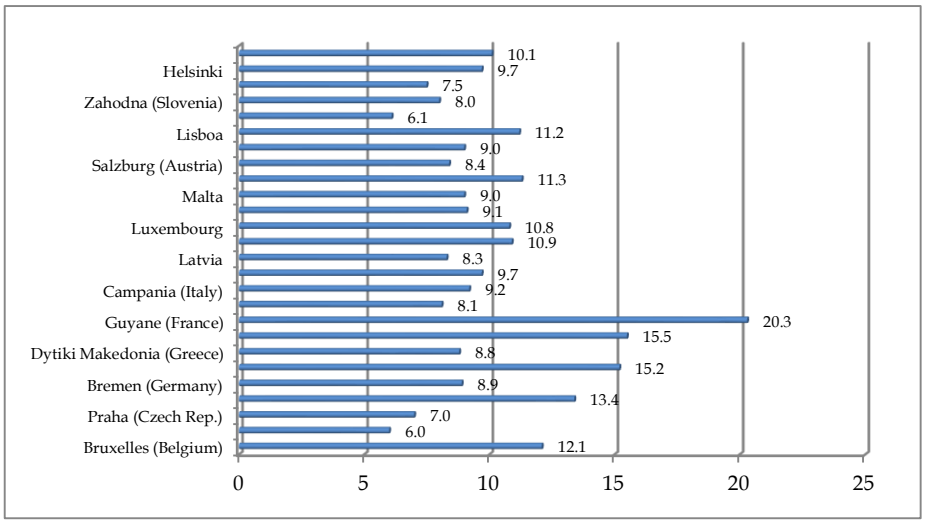

Figure 11. Pupils in primary and lower secondary education by NUTS 2 regions (% of total population)

The classic two clusters approach is supported by regression applied to this indicator (see Figure 12).

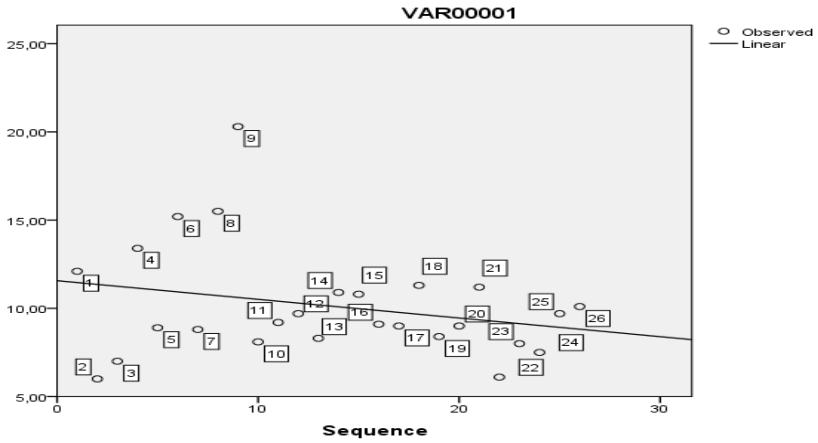

Figure 12. Regional disparities for pupils in primary and lower secondary education by NUTS 2 regions

The cluster approach in Figure 12 covers 76.9% of the initial clusters' structure from Figure 1.

The last educational indicator took into account is early leavers from education and training by NUTS 1 regions (European Commission 7, 2017). The regional disparities related to this indicator are presented in Figure 13.

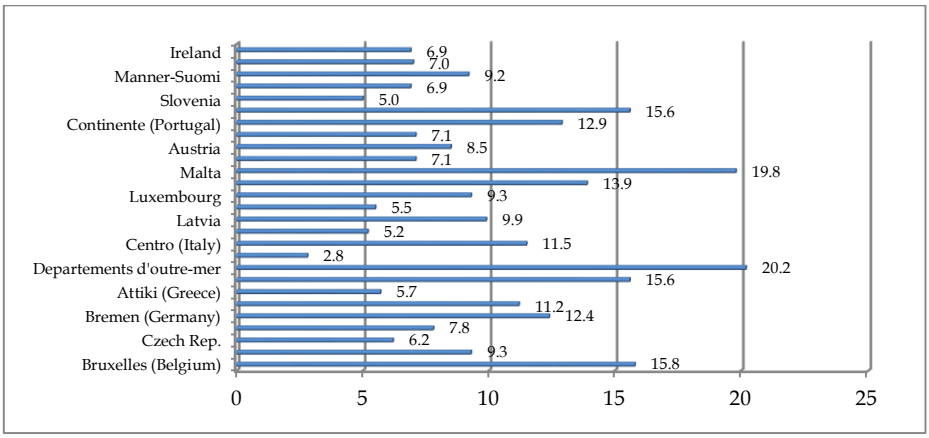

Figure 13. Early leavers from education and training by NUTS 1 regions (%)

According to the above figure, the best situation was in Croatia, while Departaments d'outre-mer faced to the worst situation. The lag between them is 1: 7.2.

The regression points out better these regional disparities, as in Figure 14.

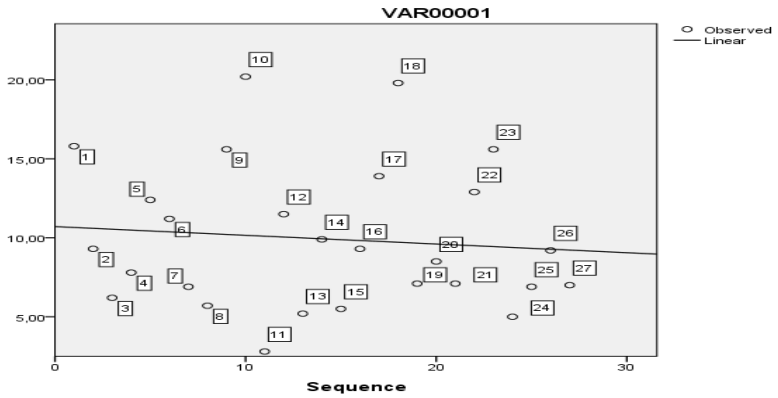

Figure 14. Regional disparities for early leavers from education and training by NUTS 1 regions

4. Regional Education Disparities in Romania

In order to analyze regional education disparities in Romania, the analysis has to focus on NUTS 1 and 2 regions, as well. The eight NUTS 2 Romanian regions faced to great enough disparities related to pupils and students in all levels of education (see Figure 15).

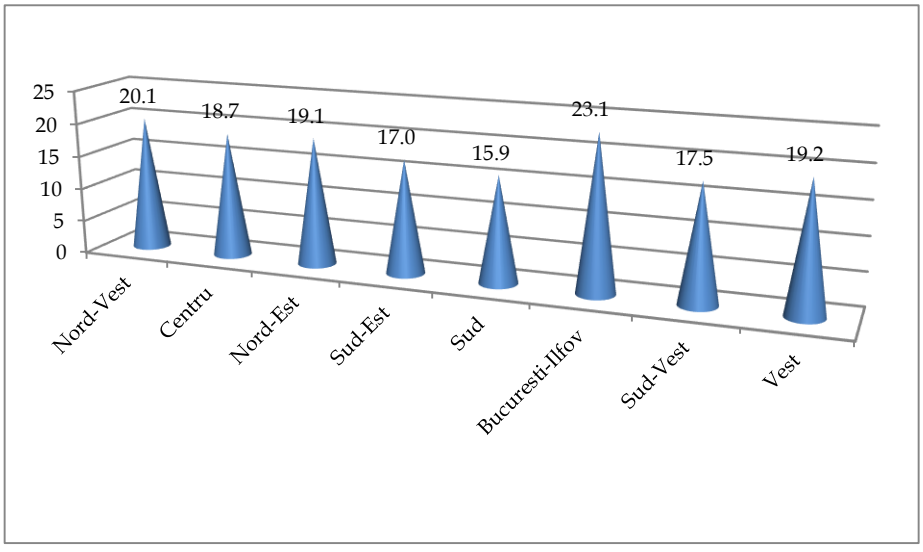

Figure 15. Pupils and students in all levels of education by NUTS 2 regions in Romania (% of total population)

Bucharest-Ilfov achieved the best situation, while Sud faced to the worst one.

The participation rate of 4-years-old in education leads to the same results (see Figure 16).

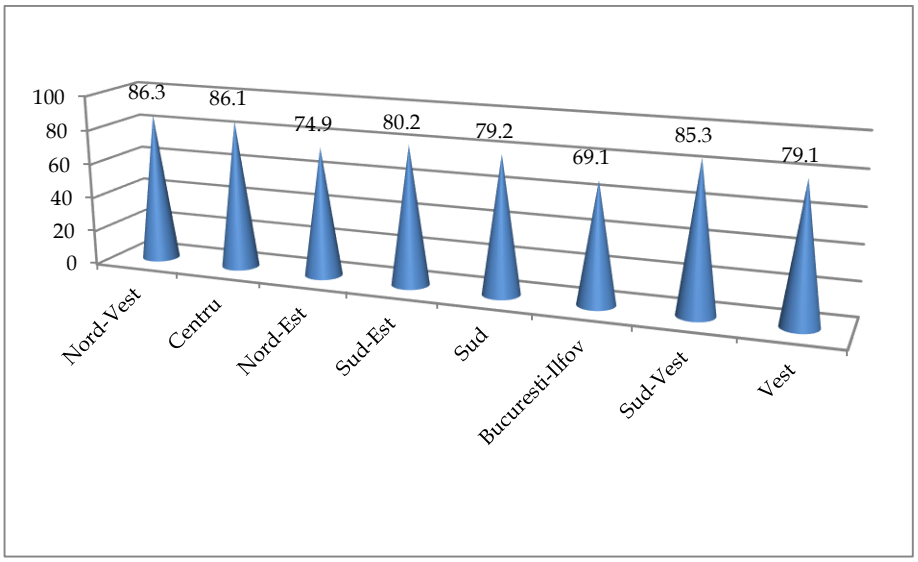

Figure 16. Participation rates of 4-year-olds in education by NUTS 2 regions in Romania (% of all 4-years-olds)

Nord-Vest, Centru and Sud-Vest achieved the best performances, while Bucuresti-Ilfov faced to the lowest participation rate.

On the other hand, Sud-Vest and Bucuresti-Ilfov are the Romanian regions with the greatest percentage of population in upper secondary and post-secondary non-tertiary education. By opposite, Centru, Nord-Est and Sud faced to lowest population in upper secondary and post-secondary non-tertiary education (see Figure 17).

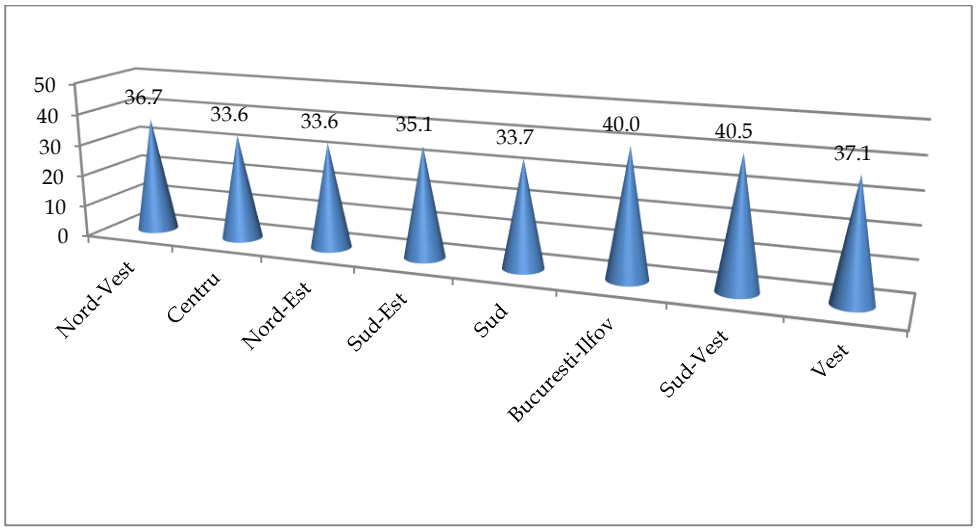

Figure 17. Pupils and students in upper secondary and post-secondary non-tertiary education by NUTS 2 regions in Romania (% of population aged 15-24 years)

The capital region has the greatest number of students in Romania. It is followed by Vest region, but the difference is about 88% (see Figure 18). The worst situation is in Sud.

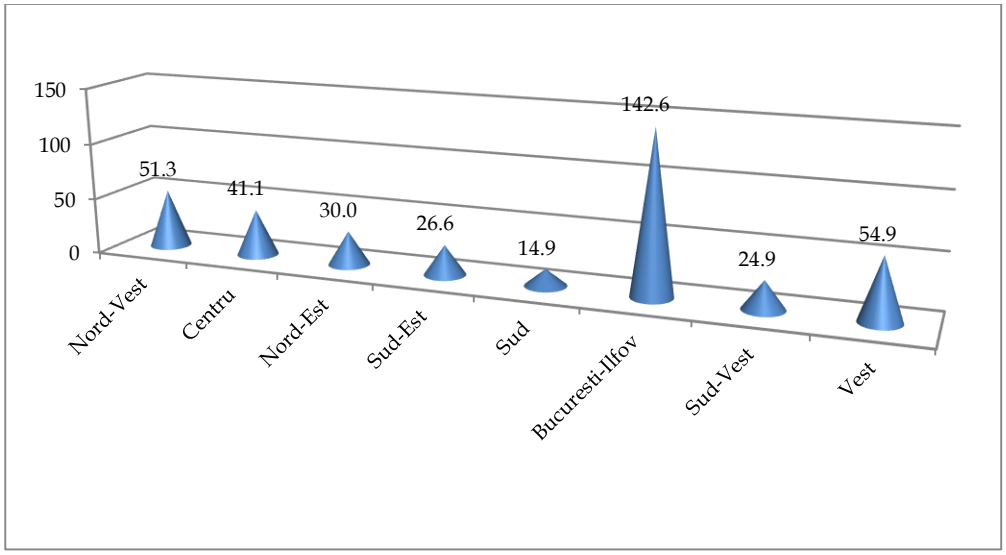

Figure 18. Students in tertiary education by NUTS 2 regions in Romania (% of population aged 20-24 years)

The last education indicator at NUTS 2 level is pupils in primary and lower secondary education. There are not significant differences between regions related to this indicator (see Figure 19).

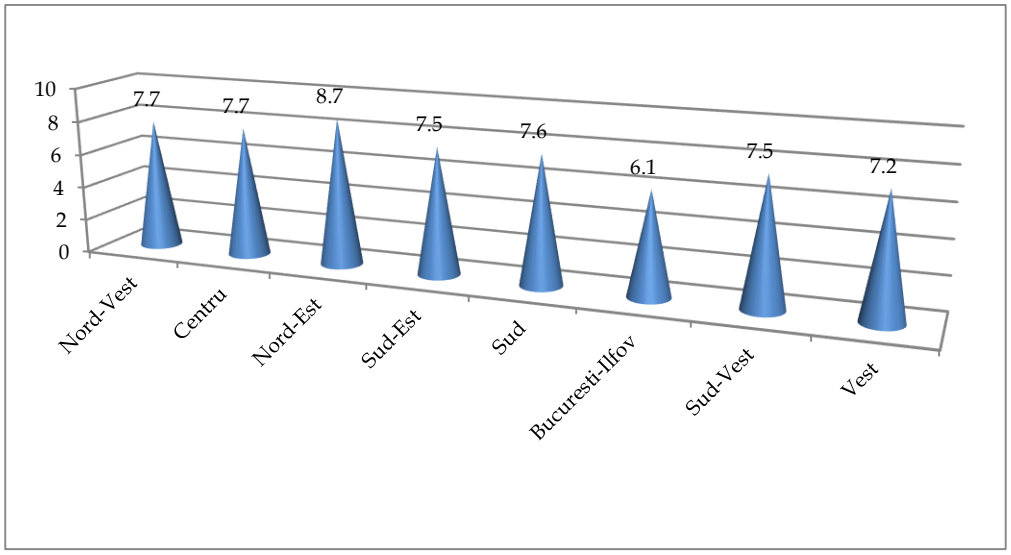

Figure 19. Pupils in primary and lower secondary education by NUTS 2 regions in Romania (% of total population)

The last two education indicators (tertiary educational attainment; and early leavers from education and training) are analyzed at NUTS 1 level.

First of them had the highest level in Macroregiunea trei, while Macroregiunea doi faced to the bottom (see Figure 20).

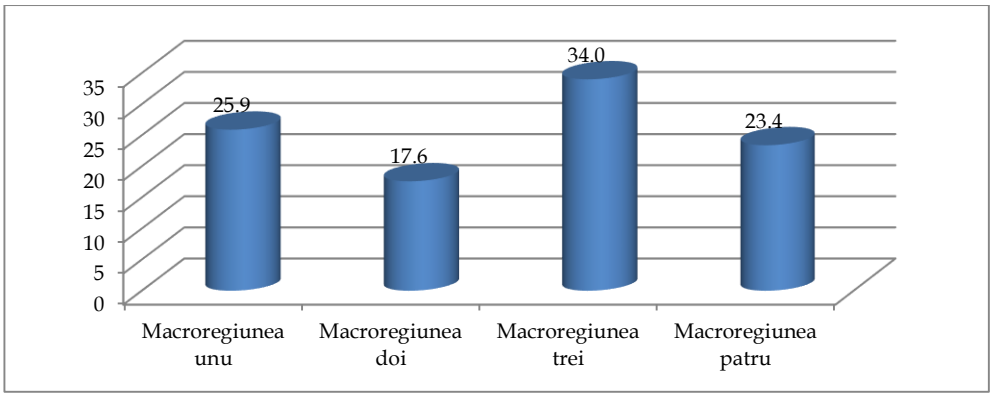

Figure 20. Tertiary educational attainment, age group 30-34 by NUTS 1 regions in Romania (% of total)

Last but not least, there are relative high values for early leavers from education and training across the NUTS 1 regions in Romania. This is why the lag between the best value (Macroregiunea patru) and the worst value (Macroregiunea doi) is 1: 2 (see Figure 21).

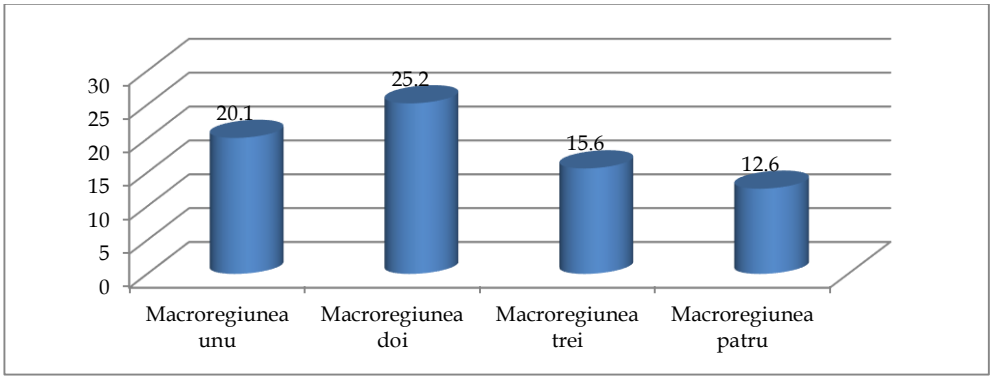

Figure 21. Early leavers from education and training by NUTS 1 regions in Romania (%)

5. Conclusions

European Commission didn't forget to mention as a principal goals education development. Unfortunately, education is not an element able to support socio-economic cohesion across the European regions.

The analysis in the paper based on seven representative education indicators leads to pessimistically conclusion: great disparities between NUTS 1 and 2 regions.

Starting to pupils and students in all levels of education, the regional analysis concludes that the selected representative regions (one region for each Member State) can be grouped into two distinct clusters with different common characteristics.

It is very interesting that the initial structure of these two clusters becomes representative for all other six education indicators took into account.

As a result, education represents an element which supports regional disparities across the EU.

Romania is not an exception from this trend. Two regions (Nord-Vest and Bucuresti-Ilfov) succeeded in having the best educational performances. Sud region faced to the worst situation, as well (see Table 1). The regions' ranks were calculated according to the five NUTS 2 education indicators.

Table 1. Regional rank in education (NUTS 2)

Region	Rank (points) related to:					Total
	pupils and students in all levels of education	participation rate of 4-years-old in education	pupils and students in upper secondary and post-secondary non-tertiary education	students in tertiary education	pupils in primary and lower secondary education;	
Nord-Vest	7	8	5	6	7	33
Centru	4	7	4	5	7	27
Nord-Est	5	1	4	4	4	18
Sud-Est	2	5	2	3	8	20
Sud	1	4	1	1	2	9
Bucuresti-Ilfov	8	2	7	8	5	30
Sud-Vest	3	6	8	2	4	23
Vest	6	3	6	7	1	23

Two other indicators (tertiary educational attainment; and early leavers from education and training) were used in order to point out the education disparities across NUTS 1 regions.

Table 2. Regional rank in education (NUTS 1)

Macroregion	Rank (points) related to:		Total
	tertiary educational attainment	early leavers from education and training	
Macroregiunea unu	3	2	5
Macroregiunea doi	1	1	2
Macroregiunea trei	4	3	7
Macroregiunea patru	2	4	6

According to Table 2, Macroregiunea trei and Macroregiunea patru achieved the best performances, while Macroregiunea doi faced to the lowest rates.

The above analysis is useful at least for the regional and local decision makers in order to find solutions for decreasing regional education disparities.

References

Aristotle, *Politica*, Vol. 5, 1, 1; 1st century.

European Commission, *Europe 2020. A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010, p. 11.

European Commission 1, *Pupils and students in all levels of education by NUTS 2 regions*, 2017, Retrieved from: http://ec.europa.eu/eurostat/tgm/printTable.do?tab=table&plugin=1&1.

European Commission 2, *Participation rates of 4-year-olds in education by NUTS 2 regions*, 2017, Retrieved from: http://ec.europa.eu/eurostat/tgm/printTable.do?tab=table&plugin=1&1.

European Commission 3, *Pupils and students in upper secondary and post-secondary non-tertiary education by NUTS 2 regions*, 2017, Retrieved from: http://ec.europa.eu/eurostat/tgm/printTable.do?tab=table&plugin=1&1.

European Commission 4, *Students in tertiary education by NUTS 2 regions*, 2017, Retrieved from: http://ec.europa.eu/eurostat/tgm/printTable.do?tab=table&plugin=1&1.

European Commission 5, *Tertiary educational attainment, age group 30-34 by NUTS 1 regions*, 2017, Retrieved from: http://ec.europa.eu/eurostat/tgm/printTable.do?tab=table&plugin=1&1.

European Commission 6, *Pupils in primary and lower secondary education by NUTS 2 regions*, 2017, Retrieved from: http://ec.europa.eu/eurostat/tgm/printTable.do?tab=table&plugin=1&1.

European Commission 7, *Early leavers from education and training by NUTS 1 regions*, 2017, Retrieved from: http://ec.europa.eu/eurostat/tgm/printTable.do?tab=table&plugin=1&1.

European Union, The Treaty on the Functioning of the European Union, *Official Journal of the European Union*, C 326, 2012, Art. 165, pp. 120-121.

European Union, *New priorities for European cooperation in education and training*, Official Journal of the European Union, C417, pp. 26-27.