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INVESTMENTS IN EDUCATION

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Abstract: *The current article aims at measuring the influence of government spending with education on the evolution of school performance using the results of the PISA tests as a main indicator. The test scores of 15-year-old students from Romania will be used in order to establish if there is a causal relationship between school performance and government spending on education. By means of a comparative analysis, this research paper intends to highlight existing red flags in the educational system as well as the financial and economic factors which need a more effective and substantial financing.*

Key words: *education, government intervention, PISA test scores, performance of the school system*

1. Introduction

Financing a healthy and efficient educational system is a challenge for a multitude of decision makers throughout the world. The benefits of education are countless, but the costs surrounding the lack of education are a reason for concern for any governmental authority. This is the case for Romania, where hundreds of thousands of Romanian children are deprived of education. According to PISA figures, between 37% and 40% of the 15-year old children in Romania have great difficulties in reading, writing, and maths. Children with disabilities or children who come from poor households, rural areas or from the Roma communities have a poor representation in primary education while also having the lowest test scores.

Even though Romania has the lowest rates in education in the EU, an upward trend can be observed in the last couple of years. Nevertheless, the allocation of resources can be considered unequal and inequitable, more funds being directed towards secondary and tertiary education, thus neglecting the preschool and primary stages. Therefore, the aim of this paper is to present possible measures that should guide policy makers when trying to answer the following research question: *Which are the financial and economic incentives that Romania needs in order to obtain the best results in education?*

The consensus among researchers in education is that the best results of any investments or public policies are observed when they target the early stages of

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education, kindergartens and primary schools. By doing so, a government can raise the number of students who attain a tertiary education degree. Having considered the high dropout rates existing in the Romanian educational system, numerous policies and programmes that are in place can be considered inefficient, thus in need of either a reform or a revaluation of their performance. Only after thoroughly evaluating which policies are efficient or not, one can decide towards which to direct funds and resources (Psacharopoulos, 2010; York et al., 2015).

Acknowledging that the governmental sector is the main supplier of education in almost all economies, this study will empirically evaluate the socio-economic impact of education by using data from 7 former socialist countries, including Romania.

2. Literature review

The benefits of education have been thoroughly studied and observed in scientific literature, both at an individual level and at a societal level. Firstly, education is strictly correlated with prosperity as established economists have stated in the early literature on this subject (Smith, 1776). One can relate to (Schultz, 1961; Chiswick, 2003, Baker et al. 2012) for a recent empirical approach towards the study of education and its benefits over society. The most common methodology observed consists of estimating a rentability rate of investments in education. The rate is a summary of costs and benefits of investments in different time spans from a specific year and it is expressed as an annual percentage.

Even if for all governments a proper functioning of the educational system represents a top priority, not all of these governments manage to attain this objective. Even if the returns on investment are uncertain at times, the majority of states have assumed the obligation of providing education as a public good. In order to measure the extent of this engagement of governments towards their citizens and to have an international mean of comparison, one can relate to the indicator of public spending with education as a percentage of GDP. In addition, this indicator also highlights the differences in resource allocation between sectors.

A plethora of studies in the field of education argue that the amount of resources an individual school possesses is a direct determinant for the test performances of its pupils. This theory was adopted by Romanian policy makers, but without a successful resource allocation, thus creating disparities and increasing inequality (Apple et al., 2010).

Starting with early 2000's, a significant contribution to the supervision and evaluation of educational systems of countries throughout the world can be attributed to OECD and its respective PISA tests. Mahuteau and Mavromaras (2013), using PISA test scores and a couple of socioeconomical indicators representing the welfare of students from Australia, have reached the conclusion that the highest dropout rates and lowest test scores were registered by those originating from low-income households with ages between 15 and 18.

2. Methodology, data, and discussion

2.1. Methodology

In order to reach the objective of this scientific article, a qualitative approach is supported by an analysis of several indicators originating from Eurostat and OECD databases. The results presented in this analysis allow for comparisons between Romania, similar ex-communist states, and OECD countries in regards to channels of financing education and government spending on education as % of GDP for year 2015.

The constructed averages concern the level of government expenditures with education as a percentage of GDP, the level of expenditures per student as a percentage of GDP, as well as the EU average expenditures for primary to tertiary education.

2.2. Data and source

The statistical analysis uses indicators from SNIE – The National System of Indicators for Education. SNIE is compatible with other worldwide used indicators originating from EUROSTAT, OECD, World Bank and includes a part of target indicators for specific common European objectives in education and human capital formation. The analysed indicators are: the percentage of students with functional illiteracy; the percentage of students with test scores included in the upper levels 5 and 6, as well as those whose test scores are of level 2 and 3 for sciences, reading and mathematics; early dropout rates and the level of preschool participation.

In order to conduct the current study, after an investigation of the scientific literature on this subject and the papers provided by international organizations, Tables 1 and 2 act as a screenshot for the 2015 expenditures with education.

2.3. Discussion

Table 1

The level of government expenditures on education and PISA test scores for EU countries in 2015

	PISA Results	Education Public expenditure (%of GDP)	GDP per capita (USD)	Education Public expenditure per pupil (%of GDP)	Education Public expenditure per pupil (USD)		
					Primary	**Secondary**	**Tertiary**
Czech Republic	490	4.25	18806	23.6	4196	6602	6672
Slovak Republic	488	4.22	16100	23.4	5099	4698	5919
Hungary	496	4.88	12635	26,8	4467	4514	6645
Latvia	487	5.01	11476	27.1	3560	3672	1607
Poland	501	5.17	11294	29.1	5302	5026	6502
Lithuania	479	5.36	11034	25	2096	3090	1986
Romania	426	3.53	7500	18.2	1500	1245	1964
UE average	:	5.44	:	28.2	7762	9513	8332

	PISA Results	Education Public expenditure (%of GDP)	GDP per capita (USD)	Education Public expenditure per pupil (%of GDP)	Education Public expenditure per pupil (USD)		
					Primary	**Secondary**	**Tertiary**
Eastern Europe average	:	4.73	:	25.7	:	:	:
OECD average	:				7719	9312	9341

Source: data collected from Eurostat and OECD

Analysing the data provided by Table 1, the level of government spending on education as a percentage of GDP is the lowest in Romania: 3.53% in 2015, as opposed to 4.73% the Eastern European average and 5.44% the EU average. The second indicator, education expenditures per pupil as percentage of GDP/capita, situates Romania significantly under the EU average with only 18%, whereas similar other Eastern European countries average between 23% and 27%.

In addition, the data provided by OECD, meaning the amount of USD required for a student's primary, secondary, and tertiary education construct a clear image on which stage governments place the highest emphasis. Yet again, Romania is situated way below the OECD and EU averages.

Another relevant aspect of Table 1 can be found in the different financing capacity of the education system characteristic of the countries of the world. Countries with a higher GDP per capita make higher expenditures for education, which will enable them to further increase the performance of the educational process, quantified through the PISA test results.

The correlation of PISA tests results with the government expenditures to finance this educational level is justified by the inclusion in the tests of the students aged 15 (according to the PISA methodology). The overall results of the Romanian students in the three basic competencies improved considerably from 2006 to 2015, but they remain well below the OECD average.

Table 2

PISA results in Romania for Sciences, Reading, and Mathematics

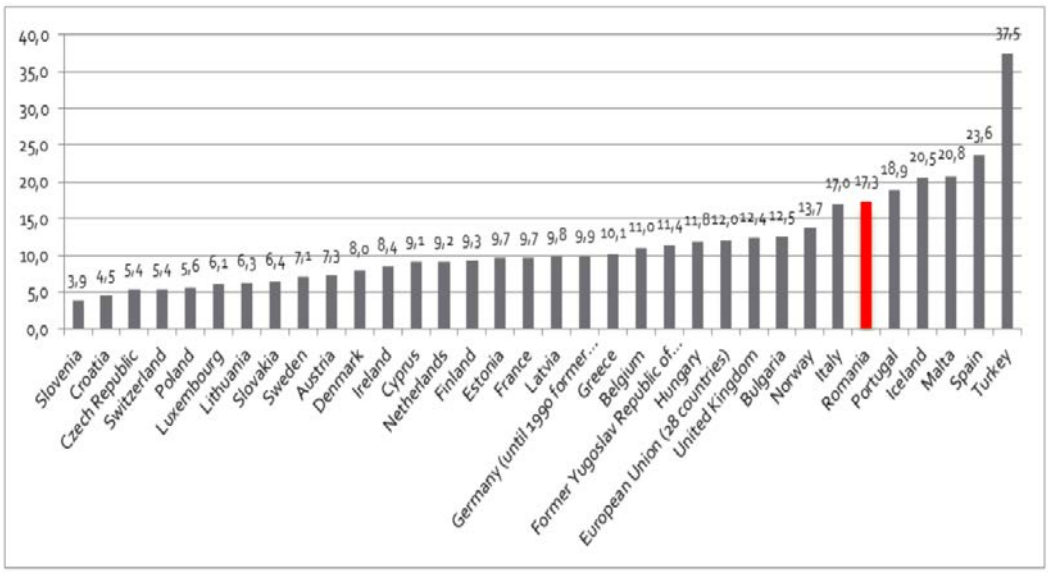
	Science	Reading/Lecture	Mathematics
2006	418	396	415
2009	428	424	426
2012	439	438	445
2015	435	434	444
OECD average 2015	493	493	490
The share of Romanian students with poor performance as of 2015	37,3%	40,8%	37,3%
The share of European Union students with poor performance as of 2015	16,6%	17,8%	21,1%

Source: Results collected by the author with OECD PISA 2006-2015 data

According to Table 2 at PISA 2015 reading, almost four out of ten students (37.3%) are below level 2 in international testing, compared to the EU-25 average (17.8%). This means that a high proportion of Romanian students aged 15 have low reading skills. Romania has similar scores in math and science too: in 2015, four out of ten Romanian students achieved very low math scores (40.8%), compared to the EU average (22.1%). In the case of science, the percentage of students with poor results is slightly lower (37.3%), but is still well above the EU average (16.6%).

In the secondary tested areas, the first being reading comprehension, Romania obtained an average score of 434 points, being the 41st out of 70 countries and being between levels 2 and 3. In the other secondary field tested, mathematics, Romania registered a score of 444 points, one point lower from the 2012 average (445 points), a score that places the country between levels 2 and 3 of the PISA scale. (Ministry of National Education, 2016).

The most important results generated by the PISA tests for Romania are related to the percentage of students included in the functional illiteracy category. According to PISA, 24,3% of the Romanian respondents performed under level 2 for all disciplines, meaning that they have high difficulties in understanding texts with a reduced level of complexity.



Source: Eurostat, 2015

Fig. 1. *The early abandonment rate of the education system and vocational training of young people between age of 18-24 years*

Another aspect that should be accounted for, besides test performance, is the drop-out rate (see fig. 1). This rate includes people aged 18-24 who have finished at most primary education and which have not opted for any type of professional school. Although the drop-out rates in Romania are lower than 10 years ago, according to the Ministry of National Education, as the values fluctuated from 17.3% in 2013 to 18.5% in

2016. In this state of play, Romania's objective of coming closer to the EU average and attaining a rate of 11.3% in 2020 seems skeptical at least.

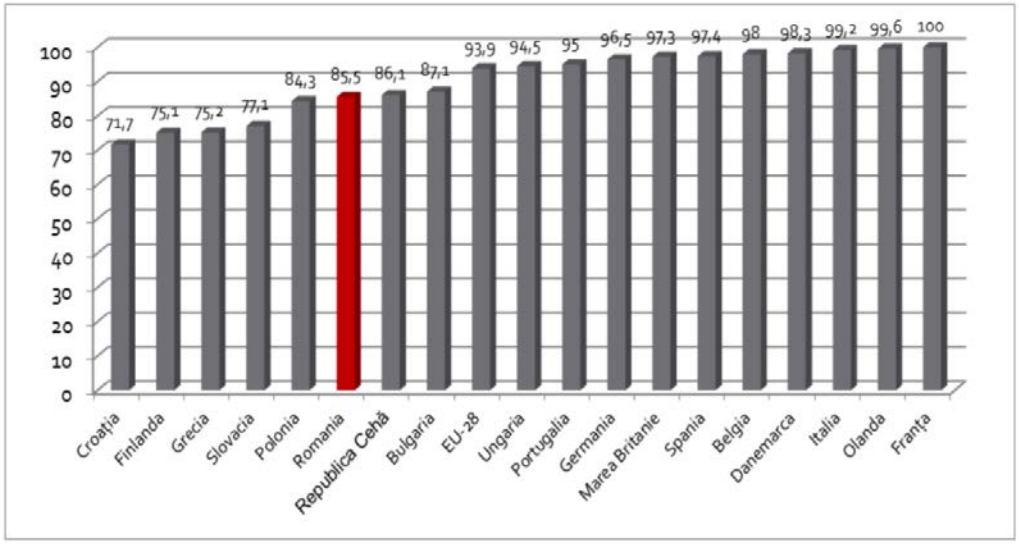


Fig. 2. *Participation in pre-school education of children between the ages of 4 and the official age of enrolment in compulsory education*
(source: Eurostat 2015)

Participation in the pre-school education of children between the ages of 4 and the official age of enrolment in compulsory education is a European indicator targeted at 95% for 2020. In 2012, the EU-27 average for this indicator was 93.9%, considerably higher than in previous years. The highest values were registered in France (100%) and the Netherlands (99.6%), Italy, Denmark, Belgium, United Kingdom, Germany, Portugal, Hungary (see fig. 2). The countries which construct the lower bracket of this classification are: Romania, Czech Republic, Poland, Slovakia, Greece, Finland, and Croatia.

For the case of Romania, significant increases can be observed from 67.6% in 2000 to 85.5% in 2013. The decrease from the peak value of 88.5% registered in 2010 can be attributed to the previous financial crisis and to a structural change in primary education – the introduction of a preparatory class, Class Zero, which basically moved children at their terminal year of kindergartens to primary schools.

Starting with 2008, in Romania there is a significant decrease trend of this European indicator, from 88, 5% in 2010 to 85.5% in 2013. This decrease can be interpreted as an effect of the economic and financial crisis that has affected the disadvantaged populations in Romania, but also as a consequence of the structural changes in primary education, more specifically - the introduction of the preparatory class as a pre-primary class.

3. Conclusion

The present analysis supports the idea that increased spending on education determines an increase in school performance. One can identify two types of investments in education: one made by the individual, more precisely, by the student's family, and the other by the state, which provides all the necessary funding of educational institutions as well as the salaries of professors and related personnel.

Certainly, the first type of investment is a rational and healthy investment in almost every case.

Nevertheless, one question arises when considering the government expenses: Are those expenses turning into profits for the state? In order to verify this question, an empirical design would be the most suitable approach towards answering this question. This remains a challenge for future research.

In regards to the PISA test scores, Romania remains at the bottom of the European countries, with averages similar to third world countries. In Romania one can observe an ongoing vivid debate around the PISA tests. The public voice states that students do not approach the tests with seriousness because they do not comprehend their relevance and importance. Even if so, this would mean that they measure the actual level of competencies that one student possesses, without being *taught to the test.*

The alarmingly high rates of functional illiterate students, the high rates of underperforming students combined with the high dropout rates and the low participation levels in pre-school education should act as a warning sign for policy makers in Romania that education is a sector in a desperate need of a more efficient and significant funding.

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