THE INFLUENCE OF FINANCING ON RESULTS IN THE PRE-UNIVERSITY EDUCATION SYSTEM

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Abstract
Expenditure on the education system plays a significant role in the economy of the public system. In the accounting of educational institutions, special emphasis is placed on the budgeting process, in which the revenues and expenditures of the entities are found. Despite a large amount of research, specialists do not agree on the role the level of funding plays in the education system and its effect on the results of the final beneficiaries of the system. In this research we tried to observe how the level of funding or average costs per pupil in European education systems influences the results of students in standardized tests. Making an estimate with the help of the linear regression model by the method of the least squares of the correlation between these two variables, we found that there was a positive correlation between them; not exceptionally strong but not negligible either.

Keywords
Public expenditures, public accounting, funding for the education system, costs per student, PISA test.

JEL Classification
H52, H61, H75, I22, M48, P43, P44.

Introduction

The public sector in a country is the part of the national economy that is usually owned and controlled by the state. (Broadbent and Gurthrie, 1992) Modern public management includes steps such as defining resources, budgeting process and reporting results. (Broadbent and Gurthrie, 1992) One of the most important tools for the management and accounting of public institutions is the revenue and expenditure budget. Budgeting is a very important activity in the public sector, which plays a far more important role than the European public management and accounting research. (Anessi-Pessina et al., 2016) Modern budgeting involves the imposition of three fundamental principles: economy, efficiency and effectiveness. This means using resources economically,

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achieving goals and results in optimal quantity and quality. (Whittington, 1994) In the national system of the public sector, education is a service that, being part of this system and being subordinated to the government, provides education services to the final beneficiaries. (Broadbent and Guthrie, 1992), "By measuring educational outcomes, we can better assess how public service programs work in the public interest."(Newcomer and Allen, 2010). Starting with the idea that “equal opportunities” means that every child has equal opportunities in accessing forms of education, we can pronounce that this can only be achieved if a community allocates the same amount of money and the same conditions to every child.(Coleman, 1969) Equality in educational opportunities can be defined as the possibility for free and open access to educational services in similar schools for all children.(Coleman, 1969) At the same time, finding a formula that ensures optimal financing, equal opportunities for every citizen is the responsibility of government.(Heald and Geaughan, 1994). In the education system, equal opportunities are usually measured in terms of the quality of schools, expressed in the cost per student, teacher training, teacher performance in tests, student-teacher ratio, infrastructure quality, library size and others. (Coleman, 1969) "In a society without a formal education system, inequalities in position, income, power, and other resources among different households are directly transmitted to the next generation."(Coleman, 1969) The role of increasing the importance of the education system is to flatten this hereditary inequality through an opening of the system, resulting in each individual being able to reach maturity with the necessary resources regardless of the circumstances in which they were born. (Coleman, 1969)

Pre-university education starts at the early age of 2-3 years with pre-school education (ISCED 1) and lasts until the age of 18-20, ending with post-secondary non-tertiary education (ISCED 2). Pre-university education in Europe and beyond has a common feature that it is largely owned and funded by public funds. In European countries, compulsory pre-university education for children starts at the age of 5-6 years and lasts until the age of 14-16, with the exception of Hungary where compulsory education begins with pre-school education, from the age of 3 years.

Based on 2015, data in OECD countries, 90.6% of the financial resources of the pre-university education system come from public funds and only 9.4% from private funds. (OECD). Public funds can be provided by local or government authorities in pre-university education systems. (Eurydice). In most countries, the early-childhood education is funded by local authorities, with the exception of Hungary, where the state enters as a funder at this level. There are countries like France, where 37% of pre-school and primary education funds come from local sources, and the rest from government sources. In the vast majority of European countries, primary education is funded by local government sources, but through various programs or financial aids, the governments can provide support. In secondary education in general, the governments provide funding, which is supplemented by sources from local authorities. (Eurydice)

1. Literature review

Given that the costs per student in education in the US almost doubled between 1970 and 2000, (Eger and McDonald, 2012), the question arises whether this increase is justified if we look at the quality of services provided and the results obtained by students. Increased funding for schools also requires more responsible management of funds. (Tooley and Guthrie, 2007). Finding a funding model that ensures the coverage of needs but avoids over or underfunding and has the function of control has long been a concern of researchers.

Modern funding models transfer allowances to public organizations based on formulas calculated explicitly based on the needs of beneficiaries. (Heald and Geaughan, 1994) The most widespread formula is the one based on the number of students. Funding formulas must be as simple to calculate as possible, to ensure predictability and measurability. (Agyemang and Ryan, 2013). Private accounting technologies have come to play a prominent role in the management of public services, including education. (Humphrey, Miller and Scapens, 1993) Thus, it is increasingly important to know if the increase in the level of funding in education has the effect of increasing the results, whether a higher input results in an increase in the output as well.

Coleman (1969) conducted cross-sectional research, using multiple regression to measure the effect of each school's characteristics on student achievement. (Coleman, 1969) He found that equality of opportunity in education is found in both levels of research, namely, the equal distribution of resources in education and their intensity in their effects. In a system with an equal distribution of funds between schools but in which the intensity of their effects is very low, there will be large differences in opportunities. It results that inequalities are not born in the education system but rather outside of the system. (Coleman, 1969) Whittington (1994) analysed the economic efficiency of public service delivery. The first condition for measuring efficiency is to find appropriate performance indicators that are comparable and measurable. In his opinion, the services provided become effective if there is a difference between the value of the marginal cost of inputs and that of outputs. (Whittington, 1994) Input measurements can be easily done on financing or expenses because they are expressed in money. The problem is measuring the value of outputs. He did the research in university education, thus proposing as the value of the output the number of full-time students. (Full-Time Equivalents, FTEs). However, this value does not express the quality of the outputs, or the result, which is essential in regard to education. Other measurement methods can be: the number of employed graduates or the dropout rate. Considering that students have different conditions, the expenses per student can generate over- or under-financing. (Whittington, 1994) Another approach says that the most commonly used cost-per-student indicator cannot be compared for different schools because these units are in a different socio-economic environment.(Eger and McDonald, 2012) As early as the 1980s, a certain type of funding was introduced in the UK, according to which the expenditure allocated to schools was calculated using a formula based on the number and age of students and the profile of the class.(Edwards et al., 1996) In another opinion, the output can be defined by the quality of the teaching activity.(Kelly and Orris, 2011) In the case of pre-university education units, the output can be measured by indicators such as: the level of completion for classes, national exams, national assessments or the degree of school dropout. The quality of schools can also be measured by the achievements of students who have reached a certain level of education. (Coleman, 1969) Hanushek says in 1986: "There seems to be no close, systematic and strong link between school spending and student achievement”. In another vein, Card, D., & Krueger, A. B. (1996) say that there is a strong link between school resources and test scores achieved by students. (Card and Krueger, 1981) If we want to measure the outputs at their full value as part of society we must take into account the added value that schools provide by measuring performance not only in the education system but also on the success of integration into the labour market. A large difficulty in measuring the output is having to wait for the students to finish school, having to gather the data from adult life as well as the data from schools. Extensive research also requires knowledge of the family situation (family background), because a student with a good family situation in a poorer school can produce very good results, and a student with a weak family background can result in a non-existent or even negative correlation with the great resources of the school.(Card and Krueger, 1981) "Empirical literature research shows that school resources tend to be positively associated with educational gains and achievements, but that the relationship is not always robust to the specific characteristics of the data set or empirical specifications."(Card and Krueger, 1981)

Card and Krueger's (1996) hypothesis was that education income increases achievement. They could not find a strong correlation, but based on the research, it can be said that there certainly is a correlation. Belmonte et. al researched whether infrastructure investments have a positive effect on student achievement. Their hypothesis was based on the fact that the environment of the teaching activity has either a positive or a negative effect on the students' results. They examined the state of school infrastructure after a natural disaster, two strong earthquakes, after which the infrastructure deteriorated in some areas, which led to massive investments in those areas. They compared the achievements of students in schools where massive investment was made in infrastructure with those that did not report damage, so they did not have any massive investments. At the end of the research, it was stated that in the conditions in which the infrastructure expenses, which were otherwise quite low, tripled the results of the students' tests, they increased considerably, especially in mathematics and especially in the students with low results. (Belmonte et al., 2020) ”Education infrastructure of high quality means that students have adequate temperature, lighting, and functional furniture that are likely to improve the quality of their learning experience.”(Belmonte et al., 2020) Hyman (2017) in his research found that a 10% increase in spending on schools in Michigan increased college enrolment by 3 percentage points and graduation from post-secondary level by 2.3 percentage points.(Hyman, 2017) Others say that investments in education materialize very late and their beneficial effect cannot be expressed with certainty. (Hong and Zimmer, 2016; Martorell, Stange and McFarlin, 2016)

Many studies measure the outputs of the system expressed by student performance, most using the results of standardized tests, others using other measurement methods.(Hanushek, 1997) In Hanushek's (1997) research, input resources are divided into 3 categories: 1) classroom resources: teacher education level, teacher experience, and pupil-teacher ratio; 2) aggregate financial resources: expenses per student and teacher's salary, 3) other resources in schools: facilities, specific characteristics of teachers, administrative conditions, etc.(Hanushek, 1997) He says there is no strong relationship between the variation in school financial resources and the variation in student outcomes. “The added resources of the current organization and the incentives of the schools are neither necessary nor sufficient to improve student performance.” “The achievement of students at a given time is related to the primary inputs: family influences, colleagues and schools.” (Hanushek, 1997) The research that takes into account the expenses per student is the most aggregated, being carried out by districts or states, but they are the ones that take into account the family situation the least. (Hanushek, 1997) Of the 400 studies studied by Hanushek (1997), 9% show that real classroom resources such as teacher studies have a positive effect, and 15% show that the pupil-teacher ratio has a statistically significant positive effect on results. 29% of the research shows that teachers' experience has a statistically significant positive effect on performance. However, 71% indicate a worsening of the results in relation to the decrease in experience. (Hanushek, 1997) Regarding the material resources, 29% of the works show that the expenses per student have a weak correlation with the results. (Hanushek, 1997) In other words, other researchers show that there is a significant correlation between students' test scores and spending on education. (Papke, 2005) He found that a 10% increase in spending increases the pass rate on the math test by one or two percentage points, a higher rate for schools where the initial pass rate was low.(Papke, 2005)

2. Research methodology

In this research we aimed to analyse the effect of costs per student in Europe on students' test scores. The research method we chose was the regression model through which we tried to find a correlation between funding in the education system and student performance. Simple regression tests the correlation between two variables x and y, where y is the dependent variable, in our case the students' performances, and the independent variable is x, the financing of the education system measured by the cost per student. (Equation No. (1))(Andrei et al., 2018)

$$y_i = b + ax_i + \varepsilon_i \quad (1)$$

Where:

y_i - dependent variable: students' test performance
x_i - independent variable funding per student
a, b - parameters to be estimated
ε_i - error

Measuring the efficiency of the system as a whole and in its complexity, it is highly difficult. In the case of entries, if we aim to create a very detailed analysis comparing educational institutions, we see great diversity in the areas in which they are located, the socio-economic environments in which they operate and the human resources they have with great influence on results. In the case of outputs, measurement is even more difficult if we want to investigate the influences on the entire society. Because of this we decided to section only a slice of reality to analyse this problem in pre-university education at the lower secondary level in European countries, namely, to analyse public costs of education in European countries measured with the indicator public spending per student and see the effect of variation on student outcomes. To measure the output, we decided to look at a standardized test, namely, PISA tests (Programme for

International Student Assessment- PISA). As a trend towards uniformity, the OECD (Organization for Economic Co-operation and Development) has initiated the International Student Assessment Program (PISA), which measures the reading, math and science skills of 15-year-old students and their ability to use these skills in real life. It tests 15-year-old students because they are the ones who, in most countries, are at the end of the years of compulsory education. We chose these tests because they are standardized and measure most of the knowledge, skills, and attitudes acquired in compulsory education in institutionalized educational institutions. “PISA assessments do not only check whether students near the end of compulsory education can reproduce what they have learned; it also examines how well students can extrapolate from what they have learned and apply their knowledge in unfamiliar environments, both in and out of school.” (PISA, 2019) These tests aim to measure students' ability to learn throughout life through the use of skills learned in school. The reason we believe that these tests can be used is that they do not investigate what students have learned during the curriculum, but the skills and attitudes they have really learned about life in practice, so they are independent of the various school curricula. Because PISA tests are performed every three years since 2000, the most recent tests were performed in 2018. As a reference period for the costs per student, we chose the six-year period 2012-2017 before performing the PISA test in 2018, because during this period the students went through the classes of the lower secondary level (ISCED 2) and we believe that the learning environment and conditions in these six years have been decisive in terms of the influence of funding on results. On the other hand, in the Eurostat database, the latest statistical data on the average annual cost per student can be found until 2017. The data related to the cost per student from 2012-2017 in European countries we downloaded from the Eurostat website and are expressed in euro shown in Table no. 1 and Table no. 2

Table no. 1. Annual expenditure on educational institutions per pupil/student based on FTE, by education level and programme orientation in euro [EDUC_UOE_FINI04]

GEO/TIME	2012	2013	2014	2015	2016	2017	Average
1	2	3	4	5	6	7	8
Austria	10,610.6	10,921.2	10,985.2	11,302.9	11,716.7	11,761.8	11,216.4
Belgium	9,311.2	9,538.2	9,570.0	9,621.2	9,883.2	10,204.5	9,688.1
Bulgaria	1,201.2	1,399.2	:	1,470.4	1,574.9	1,848.1	1,498.8
Croatia	:	:	:	:	:	:	:
Cyprus	7,033.3	6,690.6	6,481.8	6,487.9	6,462.0	6,516.9	6,612.1
Czechia	3,165.6	2,998.3	2,901.3	3,091.0	3,043.9	3,508.2	3,118.1
Denmark	14,200.8	:	13,301.2	:	:	14,606.4	14,036.1
Estonia	2,819.9	3,100.1	:	:	:	:	2,960.0

Finland	10,328.2	:	10,560.1	10,614.3	:	10,109.3	10,403.0
France	7,629.1	7,757.6	7,833.7	7,896.6	7,897.5	8,119.5	7,855.7
Germany	8,060.1	8,244.8	8,505.7	8,657.4	8,879.6	9,190.7	8,589.7
Greece	:	:	:	:	:	2,688.8	2,688.8
Iceland	8,119.7	8,473.7	9,630.0	11,141.6	13,086.2	15,537.4	10,998.1
Ireland	8,878.0	8,402.8	8,058.5	:	:	:	8,446.4
Hungary	1,985.8	2,086.1	:	2,569.2	2,833.1	2,973.6	2,489.6

Special value: not available

Source: Eurostat.

Table no. 2. Annual expenditure on educational institutions per pupil/student based on FTE, by education level and programme orientation in euro [EDUC_UOE_FINI04]

GEO/TIME	2012	2013	2014	2015	2016	2017	Average
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Italy	:	6,068.4	5,895.3	:	5,976.1	6,490.6	6,107.6
Latvia	3,627.0	2,824.0	3,208.7	3,371.8	3,065.0	3,042.2	3,189.8
Liechtenstein	:	:	:	:	:	:	:
Lithuania	2,402.7	:	2,524.3	2,486.2	2,483.6	2,609.7	2,501.3
Luxembourg	:	:	19,127.3	19,021.4	17,615.6	18,303.8	18,517.0
Malta	4,948.0	5,567.2	5,597.9	6,194.5	6,443.5	6,429.0	5,863.4
Netherlands	8,956.7	9,274.8	9,326.4	9,400.3	9,901.9	9,733.5	9,432.3
North Macedonia	:	:	:	:	:	:	:
Norway	:	:	19,679.4	18,309.5	18,167.0	18,831.4	18,746.8
Poland	2,446.5	2,570.9	2,680.3	2,749.4	2,659.9	2,895.0	2,667.0
Portugal	:	4,252.0	4,299.2	4,277.2	4,404.1	4,870.0	4,420.5
Romania	896.4	979.9	1,125.1	1,211.7	1,230.1	1,426.3	1,144.9
Serbia	:	:	:	1,042.9	:	1,154.9	1,098.9
Slovakia	2,407.6	2,902.9	3,136.4	3,624.6	3,210.5	3,410.1	3,115.4
Slovenia	5,013.2	4,849.8	4,901.3	4,714.3	4,756.2	5,008.8	4,873.9
Spain	:	4,779.0	4,756.9	4,916.7	5,009.7	5,181.4	4,928.7
Sweden	13,758.8	14,110.2	13,659.4	13,658.9	13,864.0	13,842.4	13,815.6
Switzerland	:	17,754.9	18,222.9	19,890.4	19,654.3	19,423.4	18,989.2

Turkey	:	:	:	:	1,695.9	1,509.7	1,602.8
United Kingdom	8,654.6	8,693.5	:	10,227.3	8,918.9	8,475.7	8,994.0

Special value: not available

Source: Eurostat

To optimize the calculations when estimating the parameters, we used the data from the average financing column, column 8 of Table 1, expressed in 100 euros.
The results of the PISA tests are measured in the scores obtained. For the analysis based on the data provided by the OECD, we made a table with the participating European countries that did the PISA test in 2018 and we calculated the average scores for all countries. (Table no.3)

Table no. 3. 2018 PISA results for the countries involved in the study

GEO/PISA subject	Reading	Mathematics	Science	Average
Austria	484	499	490	491
Belgium	493	508	499	500
Bulgaria	420	436	424	427
Croatia	479	464	472	472
Cyprus	424	451	439	438
Czechia	490	499	497	495
Denmark	501	509	493	501
Estonia	523	523	530	525
Finland	520	507	522	516
France	493	495	493	494
Germany	498	500	503	500
Greece	457	451	452	453
Hungary	476	481	481	479
Iceland	474	495	475	481
Ireland	518	500	496	505
Italy	476	487	468	477
Latvia	479	496	487	487
Lithuania	476	481	482	480
Luxembourg	470	483	477	477
Malta	448	472	457	459
Netherlands	485	519	503	502

Norway	499	501	490	497
Poland	512	516	511	513
Portugal	492	492	492	492
Romania	428	430	426	428
Serbia	439	448	440	442
Slovakia	458	486	464	469
Slovenia	495	509	507	504
Spain	:	481	483	482
Sweden	506	502	499	502
Switzerland	484	515	495	498
Turkey	466	454	468	463
United Kingdom	504	502	505	504

Source: OECD

In order to be able to compile the linear regression model, we eliminated the countries where we there was no available statistical data on the cost per student, e.g. Croatia, Lichtenstein, North Macedonia. In order to calculate the effect of cost variation per student on PISA results, we made four estimates based on the simple regression model with the least squares method. We used the Excel and EViews programs to estimate the parameters and tested the influence of funding separately, the average cost per student based on the results obtained in each subject reading, mathematics, science and on the average value of the score obtained in each subject. The hypothesis tested was that there is a positive correlation between the average funding per student in education and the results obtained in PISA tests.

3. Results and discussion

In the first step after entering the data, we obtained the Scatter Plot correlation graphs between the average cost per student expressed in 100 euros for PISA scores obtained separately for all subjects tested: mathematics (Graph 1), science (Graph 2) reading (Graph 3) and to the general average of all subjects (Graph 4).

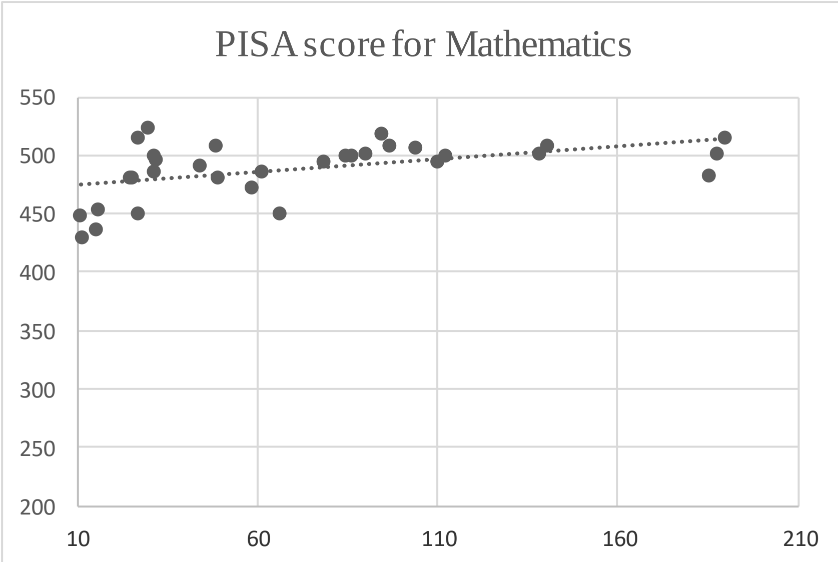

Figure no. 1: Correlation graph between mathematics score and average annual expenditure per pupil between 2012-2017
Source: created by the author on the basis of Eurostat and OECD data.

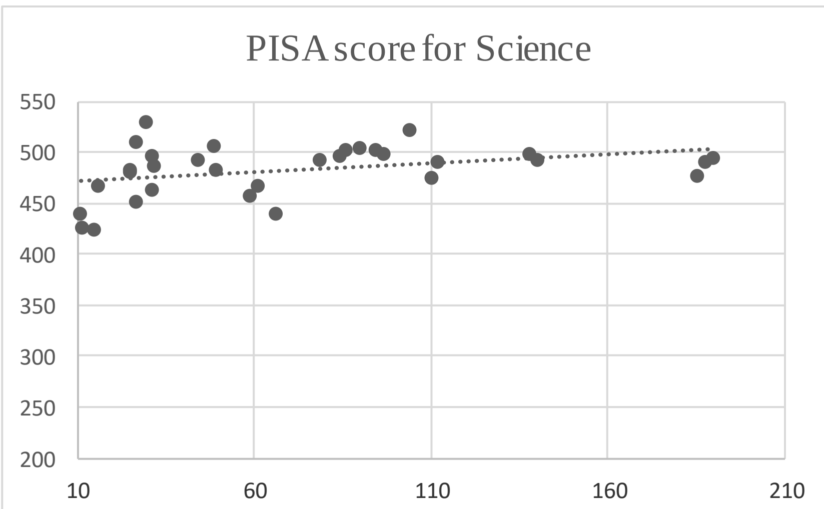

Figure no. 2: Correlation graph between science scores and average annual expenditure per pupil between 2012-2017
Source: created by the author on the basis of Eurostat and OECD data.

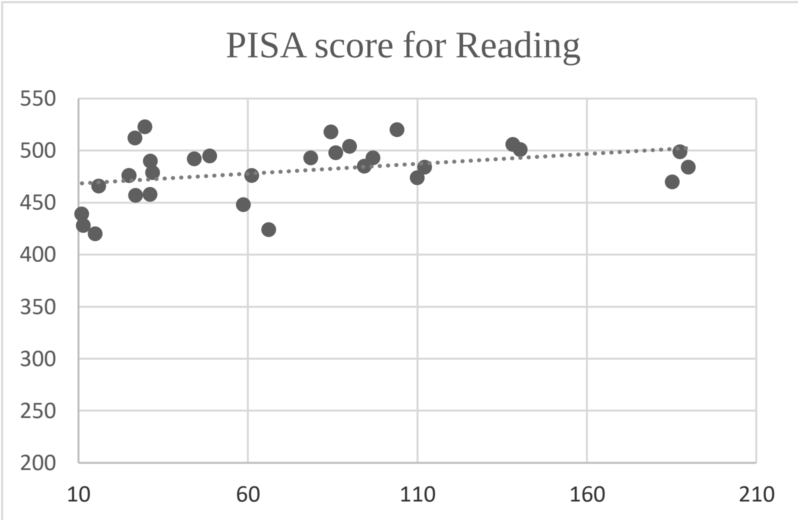

Figure no. 3: Correlation graph between reading score and average annual expenditure per pupil between 2012-2017

Source: created by the author on the basis of Eurostat and OECD data.

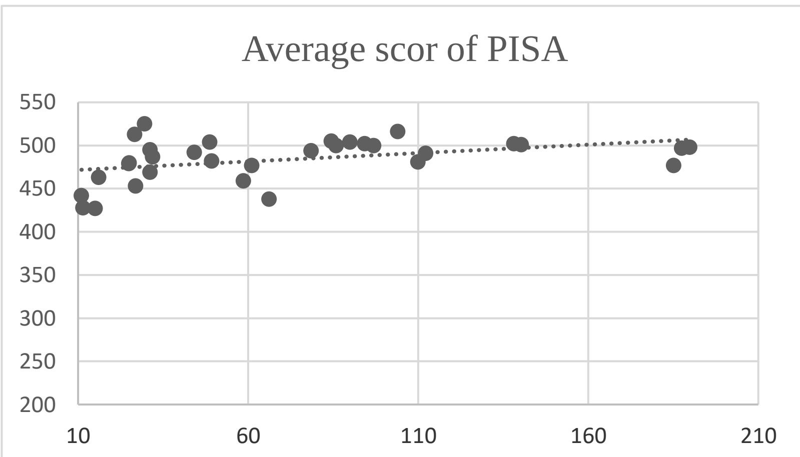

Figure no. 4: Correlation graph between average PISA score and average annual expenditure per pupil between 2012-2017

Source: created by the author on the basis of Eurostat and OECD data.

From the presented graphs, it was observed that there was an approximate linear correlation. In the next step, the values were tested to detect any outliers using the Grubbs Test. It was found that there were outliers in any of the data strings. In the next step we calculated the values for: R square, regression, adjusted R square, standard errors, and tested the validity of the models using Test F. The values of these regression statistics and F test are found in Table no.4.

Table no. 4. Values of Regression Statistics and F Statistic Value

Result/PISA	Mathematics	Science	Reading	Average
Multiple R	0.4822	0.3495	0.3678	0.4097
R Square	0.2325	0.1222	0.1352	0.1678
Adjusted R Square	0.2069	0.0929	0.1054	0.1401
Standard Error	21.8151	24.7036	26.0148	23.3239
Observations	32	32	31*	32
F statistic Value	9.08***	4.17**	4.53**	6.05**

** No available data for reading in Spain*

*** Significance F < 5%; *** Significance F < 1%*

Source: Authors' own calculation

Because, as can be seen from Table no.3, the probability of the statistic F is below the significance threshold for all four models, we can say that all four models are valid. The R square is quite small for each model. The highest level of the R square is observed in the case of the mathematics test, meaning that 23,25% of the variation of the score obtained in mathematics in the PISA test is determined by the variation of the average level of funding between 2012-2017. At the same time 12,12% in science, in reading 13,52%, and in the average of all subjects 16,78% of the variations of the obtained scores are explained by the variation of the average financing per student between the years 2012-2017.

In the next step, the validity of the coefficients was tested. This was done using the Student t test. The value of the estimated parameters (c, xi) and the value of the t-Student statistics can be found in Table no.5.

Table no. 5. Values of coefficients and t-Statistic

Result/PISA	Mathematics		Science	
	Coefficient (St Error)	**t-Stat**	**Coefficient (St Error)**	**t-Stat**
Coefficient c	472.23 (6.59)	71.56***	470.35 (7.47)	62.94***
Av_ cost xi	0.22 (0.074)	3.01***	0.17 (0.084)	2.04**
Result/PISA	**Reading**		**Average**	

	Coefficient (St Error)	t-Stat	Coefficient (St Error)	t-Stat
Coefficient c	466.47 (7.981)	58.44***	469.69 (7.055)	66.57***
Av_ cost xi	0.18 (0.088)	2.12**	0.19 (0.079)	2.45**

** P-value of T-stat< 5%

*** P-value of T-stat<1%

Source: Authors' own calculation

Table 4 shows that all model parameters are valid because the probability of t-Student statistics is below the significance threshold of 5%, moreover, the probabilities for Coefficient c are below the significance threshold of 1%, the probability of the t-test for the parameter of the independent variable for mathematics is below the significance threshold of 1%. These results indicate that the slopes of the regressions differ significantly from 0, so the results can be interpreted. Analysing the values of the parameters of the independent variables we can say that the variation of the average cost per student in 2012-2017 positively influences the variation of the PISA test results for all tested subjects. At the same time, we can say that in the case of the average score obtained, the increase of the cost per student by 100 euros/year has the effect of increasing the average score obtained by 0.19 points. This value in the case of mathematics is 0.22 points, in the case of science 0.17 points, and in reading 0.18 points. It can be seen that funding has the greatest influence on math results, probably because this subject requires the most assistance from the teacher and implicitly from the school. In the next step, for the safety of the validity of the models, the residual values were tested, the results of which can be seen in Table No.6.

Table no. 6. Residual diagnostics values

Statistics/PISA test	Model 1 Mathematics	Model 2 Science	Model 3 Reading	Model 4 Average
Test White (Prob. Chi-Square)	0.1534	0.1101	0.3152	0.1041
Test Breusch-Godfrey (Prob. Chi-Square)	0.3270	0.5658	0.1318	0.3633
Test Jarque-Bera (Prob.)	0.7564	0.8956	0.7782	0.7872

Source: Authors' own calculation

To test the residual values, the following hypotheses were tested:

- H0: *The variance of the errors is constant*, homoscedasticity: The test was performed with the White Test, because this test can detect heteroscedasticity (Andrei et al., 2018) Following the analysis of the results, it can be seen that the values exceed the significance threshold of 5%, so the null hypothesis is accepted: all models are homoscedastic.
- H0: *The errors are not autocorrelated*. The lack of error autocorrelation test was tested with the Breusch-Godfrey Serial correlation LM Test, which showed that the values exceed the significance threshold of 5%, so the null hypothesis is accepted: the errors are not autocorrelated in any of the models (Andrei et al., 2018).
- H0: *Errors are distributed normally*. Error normality testing was performed using the Jarque-Bera test (Andrei et al., 2018) Following the test, it was found that the values exceed the significance threshold of 5%, so the null hypothesis is accepted: the errors are normally distributed in each model.

Conclusions

Considering the results of the analysis based on the data about the average annual expenditures per student between 2012-2017 and the scores obtained on PISA tests in 2018 in the European countries studied, it can be said that our hypothesis was proven, as there is a positive correlation between average funding per student from education and test results. This correlation means that the variation in funding in the sense of the increase positively influences the results obtained by students. However, seeing that the R square of the models is quite low, we can say that these models reflect only a small part of reality without taking into account a very large number of other factors, which influence students' performance. Thus, the disadvantages of this research consist in the fact that we analysed only one variable that affects the results, and the results are expressed with a single type of indicator: the result of standardized tests. At the same time, the significant difference between the highest and the lowest value of expenses cannot be found in the results to the same extent, so it cannot be said that the accentuated increase of the financing is justified in each case.

The management of educational institutions must find the most appropriate organizational measures in order to ensure the lowest possible number of students per teacher in order to achieve the best results in tests without affecting the possibility of covering salary and other expenses. Accepting that existing and accessible statistical data are somewhat old, further research should verify whether the change in funding level will have the same effect on test results in the coming years with a possible extension of research with other explanatory variables such as: student teacher ratio, the rate of education expenditure in GDP, wage expenditure or expenditure on investment in education. However, the results show that the level of financial resources affects student test scores to some extent, so funders cannot neglect these effects, taking into account in the process of preparing revenue and expenditure budgets, it is the responsibility of government and policy makers to find the optimal level of funding based on the cost per student.

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