THE INFLUENCE OF EDUCATION ON SOCIAL AND ECONOMIC DEVELOPMENT

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Abstract: *The social and global context involves numerous structural and functional changes, and the task of education is unprecedented and difficult. The education is related to well-being and competitiveness. Countries that have invested over time in the education system are the ones who today, are gathering the fruits of development, being at the top of the human development index in the world. The present paper analyzes the influence of expectancy of schooling on the degree of well-being of the population. To show the relationship between the two variables, we use the simple regression method, to construct a linear model for the period 2010 and 2017. The independent variable is considered expected years of schooling and the dependent variable is Gross Domestic Product. The calculations resulting led to the conclusion that the variation of Gross Domestic Product is explained at a rate of 71% by the variation of expected years of schooling.*

Keywords: *Human Development, expectancy of schooling, education, Gross Domestic Product.*
JEL Classification: *I25, C25.*

1. Introduction

The social and global context involves numerous structural and functional changes, and the task of education is unprecedented and difficult.

The issue of the contemporary world, characterized by universality, globality, complexity and priority character is increasingly proving that the most effective solutions can not be found through sequential and parcels, but requires vision holistic approach to studying and decanning the most effective means of solving the seas problems faced by mankind. By structure, objectives and content, education must to respond continuously to the exigencies demanded by the evolution of national and international reality.

The meanings and effectiveness of the educational act are given by the availability of education adaptation and self-regulation to the widespread defiance of social space.

In the new economic context, characterized by instability, crises and pressure competitive, human capital is therefore becoming an essential pillar leads to growth and economic development, being recognized that it is one of the engines of economic development, both at the social and community level and individual levels.

2. Theoretical approach

Famous economists have shown over time that there is a close interdependence between the level of development of a nation and education, and they have been concerned with deciphering the meaning of education and bringing more light on the complicated link between economic and educational development (Badea, 2012).

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Development is more than capital accumulation and reducing inefficiencies in the economy. It's transformation society, the removal from the traditional way of working and thinking to a modern one (Stiglitz, 2002).

The attention given to education is reflected in the obtained macroeconomic results. Increased spending on education, reducing dropout, but especially keeping students with exceptional results at national and international competitions will lead to sustainable growth in GDP (Teselios, 2014). Also, Teselios D. and other researchers have studied in the past, the link between education and the social and economic growth of a country.

Increasing education positively affects the living standards of the individual, and his welfare. For quantifying the welfare is used the Human Development Index (HDI) which represent a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living (Voineagu, Dumitrescu and Ștefănescu, 2009, pp.16-20).

Indicators corresponding to each of the three dimensions refer to life expectancy at birth, expected years of schooling (or schooling expectation), mean years of schooling, gross national income per capita (Figure 1).

Life expectancy at birth: Number of years a newborn infant could expect to live if prevailing patterns of age-specific mortality rates at the time of birth stay the same throughout the infant's life.

Expected years of schooling: Number of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child's life.

Mean years of schooling: Average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each level.

Gross national income (GNI) per capita: Aggregate income of an economy generated by its production and its ownership of factors of production, less the incomes paid for the use of factors of production owned by the rest of the world, converted to international dollars using PPP rates, divided by midyear population.

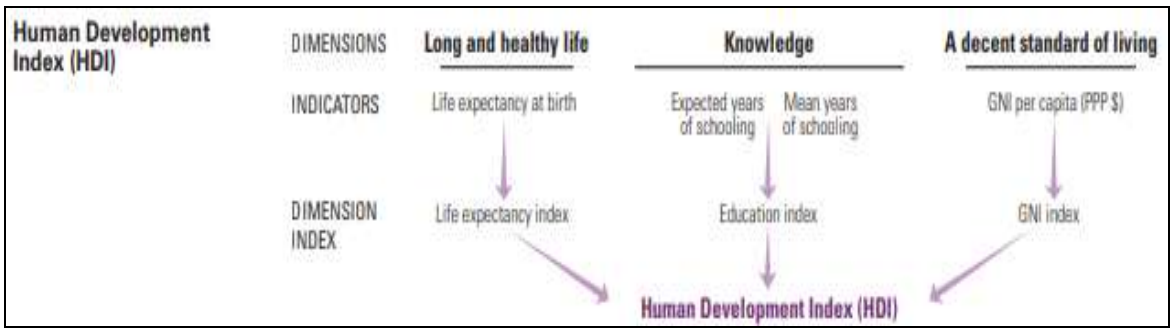

Figure 1. The components of the human development index(HDI)

Source: United Nations Development Programme, 2018. *Human Development Reports, Technical notes.* [pdf] Available at: <hdr.undp.org/sites/default/files/hdr2018_technical_notes.pdf> [Accessed 6 April 2019].

According to data provided by the United Nations Development Programme, the first three positions are occupied by Norway (HDI = 0.953), Switzerland (HDI = 0.944) and Australia (HDI = 0.939). The last places are Central African Republic (HDI = 0.367), South Sudan (HDI = 0.388), and Niger (HDI = 0.354). Romania ranks 52th in the top of the human development index with a HDI value of 0.811 (Figure 2).

-	Rank	Country	Human Development Index (HDI) (value) ▲	Life expectancy at birth (years) SDG3	Expected years of schooling (years) SDG 4.3	Mean years of schooling (years) SDG 4.6	Gro (GNI)
	1	Norway	0.953	82.3	17.9	12.6	
	2	Switzerland	0.944	83.5	16.2	13.4	
	3	Australia	0.939	83.1	22.9	12.9	
	51	Bulgaria	0.813	74.9	14.8	11.8	
	52	Romania	0.811	75.6	14.3	11.0	
	53	Belarus	0.808	73.1	15.5	12.3	
	189	Niger	0.354	60.4	5.4	2.0	
	188	Central African Republic	0.367	52.9	7.2	4.3	
	187	South Sudan	0.388	57.3	4.9	4.8	

Figure 2. Human Development Index (HDI) Ranking of the world

Source: United Nations Development Programme, 2018. *Human Development Reports, Technical notes.* [pdf] Available at: <hdr.undp.org/sites/default/files/hdr2018_technical_notes.pdf> [Accessed 6 April 2019].

Regarding the evolution of the human development index in Romania during 2010-2017, the situation is as shown in the figure below, from an HDI value of about 0.78 in 2010 to a value of approximately 0.81 in year 2017 (Figure 3).

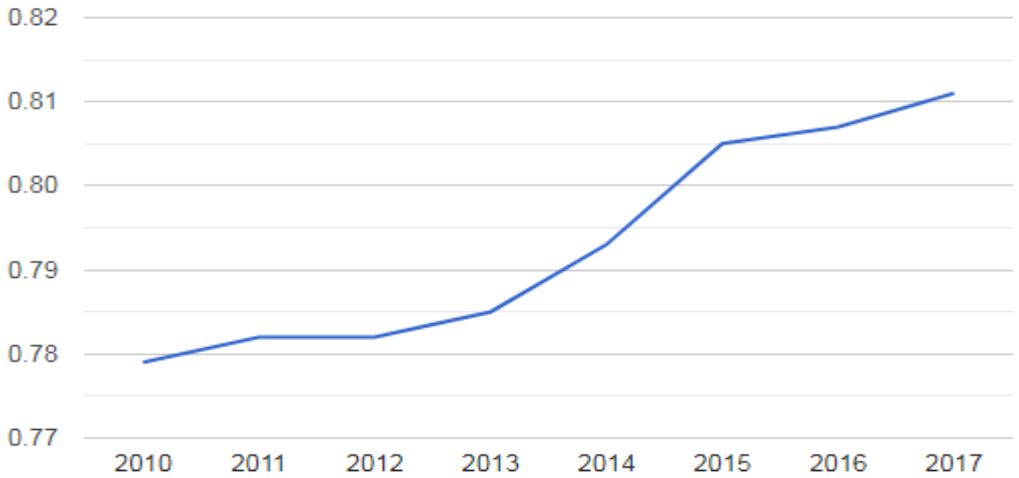

Figure 3. Romania Human Development Index

Source: The Global Economy, 2019. *Romania: Human development*. [online] Available at: <http://www.theglobaleconomy.com/Romania/human_development/> [Accessed 6 April 2019].

Regarding the dynamics of the economic growth in Romania during the period 2010-2018, the data for 2018 being provisional, the values fluctuate as shown in the figure below. In 2017, economic growth peaked at 8.8, followed by a fall to between 4.1-4.2 in the first quarter of 2018. Forecasts based on statistical data provided by the National

Statistics Institute, refers to maintaining these values of 4.1-4.2 for economic growth in 2019 as well (Figure 4).

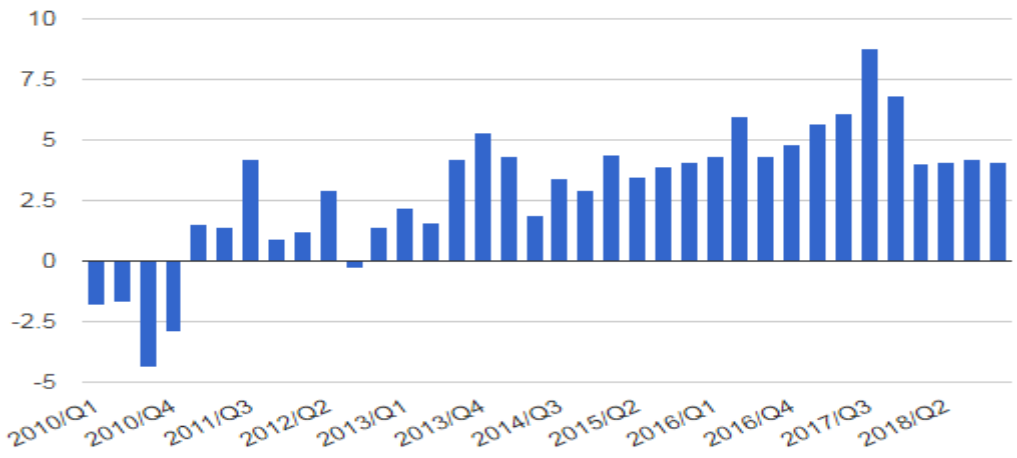

Figure 4. Romania Economic (GDP) growth, percent

Source: The Global Economy, 2019. *Romania: Human development*. [online] Available at: <http://www.theglobaleconomy.com/Romania/human_development/> [Accessed 6 April 2019].

Regarding the rate of growth of gross domestic product per capita, the information provided by INS can be found in the table below. Between 2010 and 2016, the growth rate of domestic product per capita registered a positive evolution from the negative value of -0.2 in 2010, when Romania was going through a period of economic crisis to 5.4 in 2016, this year being the last updated year in the INS database (Tabel 1).

Table 1. Real Gross Domestic Product per capita, growth rate of Romania

year	Gross Domestic Product
2010	-0,2
2011	1,6
2012	1,1
2013	3,9
2014	3,5
2015*	4,5
2016**	5,4

Source: National Institute of Statistics, 2019. *Baze de date statistice*. [online] Available at: <www.insse.ro/.../O1_1Rata%20de%20crestere%20a%20PIB%20pe%20locuitor.xls> [Accessed 6 April 2019].

As we said above the Human Development Index (HDI) represent a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living. The indicators corresponding to these three dimensions: Life expectancy at birth, Expected years of schooling, Mean years of schooling, GNI per capita, for Romania in 2010-2017, are presented in the table below (Table 2).

Table 2. Romania's HDI trends based on consistent time series data

Year	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (2011 PPP$)	HDI value
2010	73.8	15.7	10.6	17,100	0.798
2011	74.1	15.3	10.7	17,333	0.797
2012	74.3	14.7	10.8	17,511	0.794
2013	74.3	14.7	10.8	18,103	0.797
2014	74.7	14.7	10.6	18,895	0.798
2015	74.8	14.7	10.8	19,428	0.802
2016	75.1	14.2	10.9	20,928	0.807
2017	75.6	14.3	11.0	22,646	0.811

Source: UNESCO, 2019. *Data by theme*. [online] Institute for Statistics. Available at: <http://data.uis.unesco.org/index.aspx?queryid=242> [Accessed 6 April 2019].
United Nations Development Programme, 2018. *Human Development Reports, Technical notes.* [pdf] Available at: <hdr.undp.org/sites/default/files/hdr2018_technical_notes.pdf> [Accessed 6 April 2019].

3. Research methodology

We use Data Analysis in Tools menu of the Microsoft Excel to construct a linear model of simple regression for the analysis of the interdependence between the Gross Domestic Product and expected years of schooling, for Romania in the period 2010-2017. To show the relationship between the two variables, we use the simple regression method, which led to the linear model of the form:

$$Y = a_0 + a_1 X + \varepsilon, \quad (1)$$

where Y(endogenous variable) = Gross Domestic Product in Romania during 2010-2017, X (exogenous variable) = expected years of schooling for Romania during 2010-2017 and ε = random variable that summarizes the influence of other variables (unspecified in the model) on the Gross Domestic Product.

4. The results of the research

The result of the statistic correlation method is negative -0.848285, which means there is a reverse link between Gross Domestic Product and expected years of schooling as shown in table below (Table 3).

Table 3. The statistic correlation method

	GDP	Expected years of schooling
GDP	1	
Expected years of schooling	-0.848285	1

Source: data processed by the author

The value of the correlation coefficient between time series of Gross Domestic Product and expected years of schooling for Romania is "multiple R" = 0.8482, the significance is that between the two variables is an average positive correlation.(figure 5)

The coefficient of determination (R Square) being of 0.7195 indicates that the variation of Gross Domestic Product is explained at a rate of 71% by the variation of expected years of schooling.

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0,84828532							
R Square	0,719587984							
Adjusted R Square	0,663505581							
Standard Error	1,176347415							
Observations	7							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	17,75531951	17,75531951	12,83090493	0,015840919			
Residual	5	6,918966203	1,383793241					
Total	6	24,67428571						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	55,0500994	14,58554988	3,774290297	0,012965656	17,55674981	92,543449	17,55674981	92,543449
X Variable 1	-3,51491054	0,981263471	-3,582025255	0,015840919	-6,03732859	-0,992492481	-6,037328592	-0,992492481

Figure 5. Summary output of the regression method

Source: data processed by the author

The Adjusted R Square value is 0.6635 which refers to the adjusted value of determination coefficient.

Using the values from Coefficients column, we obtain for the equation(1) the linear model below:

$$Y = 55.0500994 – 3.51491054X \quad (2)$$

The coefficient for the independent variable, recorded the value of -3.51491054, a negative value which indicates a reverse link between Gross Domestic Product and expected years of schooling. The free term equal to 55,0500994 represents the value of the dependent variable when the independent variable is equal to zero. The significance limit, F-test, in the ANOVA table above (Figure 5) validate the model since F is 12,830 and Significance F is 0.01584 (lower than 0.05) we conclude that the regression model is valid and we can use it to analyze the relationship between the two variables.

Since t Stat = 3.77429 and P- value = 0.0129 <0.05, means that the coefficient is significantly different from 0, and the confidence interval is [17.55674; 92.543449]. In this case, P-value = 0.0129 <0.05, the coefficient is significant and the confidence interval for the variable is [-6.03732859; -0.992492481].

5. Conclusions

In this work we have underlined the existence of a link between gross domestic product and expected years of schooling. The study' findings highlighted a reverse link between the two indicators, which leads to the conclusion that reducing the expected years of schooling indicator will lead to an increase in gross domestic product.

Obviously, education has become a way of guiding social evolution and underpinned to all the transformations that take place in society. The vicious circle of education represents in the present society that system that creates values and norms, which impose and modify them according to the state of science, technology, knowledge. Therefore, any society and every being are the fruit of education, this generating effects and results that should be superior to the level prior to knowledge.

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