HUMAN CAPITAL: CAUSE AND EFFECT OF THE ECONOMIC GROWTH. AN EMPIRICAL ANALYSIS

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Abstract *From the birth of the human capital theory, economists were interested to find evidences showing the impact of the human capital on the economic output, discussing and debating more or less the effect of economic growth on the accumulation of human capital in the economy and the association between education and health.*
The paper aims to test several econometric models to explain the relationship between human capital and economic output. Using World Bank data, 17 countries with the fastest economic growth rate during 1960-2010 were selected. Four econometric models are tested to explain the accumulation of human capital as input and as effect of economic output. Correlation coefficients were calculated to highlight the association between education and life expectancy.
The paper demonstrates that human capital, in his two components (education and health), in countries with a fast growth rate, are positively and strongly related to the economic output, in both senses, human capital being input and output of the economic growth. On the one hand, the economic growth adds to the resources available in the economy for improvements in health and education and, on the other hand, human capital is influencing significantly the economic output. Education and health are interrelated, being positively and strongly associated.

Keywords: *human capital, education, health, economic growth*
JEL Classification: J 24, I 25, I15, O40

1. Introduction

The relationship between human capital and the economic output is intensively investigated in the literature of human capital. Several cross-country evidences supports the idea that human capital development is an important element in explaining variations in growth rates and level of per capita income.
Educational and health capital are the two main components of the human capital (Neagu, 2010). There are several studies analyzing the effects of the education and life expectancy on the economic growth. But there is less studied the explanation of human capital (health and education) evolution as a dependent variable on the economic output.
The aim of the paper is to explore the relationship between human capital and economic growth, in its both senses, by testing how the two components of human capital: educational and health capital are associated with the economic output (as cause and as effect of economic growth).
The paper is organized as follows: after a short literature review in section 2, the theoretical approach and the methodology of the study is described in section 3. In the section 4 are presented the main findings of the study and the section 5 contains the final conclusions and further research.

2. Human capital and growth: a short literature review

The studies of Paul Romer (1990) regarding the effects of the human capital investment on economic growth concluded that the human capital stock determines the rate of economic growth, meaning that an economy with a higher human capital stock will evolve faster. The model of economic growth developed by Romer explains the fast economic growth of the developed countries in the 20th century, emphasizing that the low levels of human capital explain why are unobservable the progress of the underdeveloped countries, as they could benefit from their integration in the world economic network. He concluded that the rate of return in education can explain the rate of economic growth, through cross country regressions.

Robert Lucas (1988) developed growth models with human capital accumulation and specialized human capital accumulation, through activities like learning by doing and in the job training.

Nancy Birsdall, Thomas Pinckney and Richard Sabot studied the economic growth and education in countries with abundant resources and concluded that these countries expend less for education, in average, than other countries. The explanation resides in the "virtuous growth circle" , in which education, as investment in human capital, has direct and indirect effects on the economic output. In rich countries the yearly increase by 1,4% of the enrollment rate in primary and secondary education has lead, in 25 years, to a difference of 40% in GDP per capita.

Hanushek and Kimko (2000) concluded that the results to mathematic and science in 31 countries are positively and strong related to the growth of the macroeconomic output. Hanushek and Woessman (2009) conceived a methodology for estimating the human capital quality and its effect on macroeconomic output.

The international organizations and several economists are suggesting that the investment in education have to be a priority of the governments in the developing countries (Becker, 1994 Hanushek, 1995, UNDP, World Bank).

Barro and Lee constructed data sets, several times (2000, 2010), on educational attainment in the world, to investigate how output relates to the stocks of human capital measured by average years of schooling and as well as by the composition of educational attainment of workers at various education levels. They found a significantly positive effect of schooling on output.

In the OECD countries, several studies highlighted the positive impact of the human capital on the GDP per capita growth. The absolute value of the differences between the human capital stocks in rich and poor countries is the right factor determining the convergence of the poor countries towards the rich countries (Cohen and Soto, 2001).

Several studies explored the relationship between the accumulation of human capital and the economic output. Schultz (1961, 1962a, 1962b, 1963, 2003), Barro (1991), Bils and Klenow (2000), Mankiw et al(1992) identified a significant contribution of human capital (measured by the schooling rate) at the GDP growth. Barro and Sala-i-Martin (1995) found that the average schooling years have a significant positive impact on the economic output. Mamuneas, Stavides and Stengos (2002) concluded that the sensitivity of the human capital to the economic output is differentiate between countries, is positive for developed countries and for developing and underdeveloped is lower or zero.

Factors accumulation, inclusively, human capital accumulation, can explain the income differences across countries. In a panel regression of 83 countries, Soto (2009) found the coefficient of schooling as highly significant.
The literature of human capital is less focused on health and its impact on the economic output. There some studies carried out by Grossman (1972, 1999), Schultz (1962), and Gary Becker (2007) which are considering health as a form of human capital. Bloom, Canning and Sevilla (2001) found that a good health has a positive, sizeable and statistical significant effect on aggregate output. In 2004, Bloom, Canning and Sevilla argued that life expectancy effect in growth regressions appears to be a labour productivity effect.
Several studies, using WHO Data, concluded that health is an important determinant of income (i.e.Weil, 2005). But there are a number of indirect channels through which health affects a country are output. Several of these indirect channels, such as the effect of better health in encouraging the accumulation of human and physical capital, could have positive impact on income that are as large as the direct channel.

3. Theoretical approach and methodology

The assumptions of the study are: (i) the economic output positively influences the accumulation of human capital in the economy, (ii) the human capital has a positive impact on the economic output (iii) as two expressions of human capital, education and life expectancy, are strongly interrelated.
From the World Bank statistics I extracted time series for the period of 1960-2010 of the following data regarding world countries: GDP per capita, growth rate, life expectancy, enrolment rate in secondary education. Then, I selected countries that fulfil simultaneously the following criteria: (i)the level of economic growth rate (above the average world level (4,2%) for 1960-2010), (ii) data availability for all years (growth rate, GDP per capita, life expectancy, enrolment rate in secondary education), (iii) a standard deviation of the growth rate between 1960-2010 under the value of 7,5. The final numer of selected countries was 17.
For each of the 17 countries, I used four regression equations. First, I assumed that life expectancy as a proxy of health capital is dependent on economic growth and the dependence is quadratic. This assumption is inspired by the findings of Hicks (1987). Second, I used the same assumption for the rate of enrolment in secondary education as a proxy of educational capital. Third, I assumed that the economic output, measured by GDP per capita, is a quadratic function of education, using the findings of the same author. Fourth, I assumed that economic output is dependent on education and life expectancy.
For the i country, the estimated 'life expectancy' LE_i can be obtained through the equation:

$$LE_i = a_i + b_i y_i + c_i y^2 \quad (1)$$

where: a_i is a constant parameter for the *i* country; b_i, c_i are the regression coefficients and y_i is GDP per capita for the *i* country.

For the *i* country, the estimated 'rate of enrolment in secondary education', ER_i can be obtained through the equation:

$$ER_i = d_i + e_i y_i + f_i y^2 \quad (2)$$

where: d_i is a constant parameter for the *i* country and e_i, f_i are the regression coefficients and y_i is GDP per capita for the *i* country.

Then a regression equation was used to verify how the effect of education is reflected in the economic output:

$$y_i = m_i + n_i ER + o_i ER^2 \quad (3)$$

where: m_i is a constant parameter, n_i, o_i are regression coefficients and y_i is GDP per capita for the *i* country.

Finally, we can estimate the effect of both forms of human capital (education and life expectancy) trough the equation:

$$y_i = k_i + h_i ER_i + g_i LE_i \quad (4)$$

where: k_i is a constant parameter for the *i* country, h_i, g_i are regression coefficients, y_i is GDP per capita for the *i* country, ER_i is enrolment rate in secondary education and LE_i is life expectancy.

There were calculated, for the selected countries, the coefficients of partial correlation between growth rate, GDP per capita, on one hand, and enrollment in secondary education rate and life expectancy on the other hand and finally, the correlation between the two types of human capital (education and life expectancy).

4. Results and discussion

4.1. Life expectancy and economic output

In all countries included in the survey, except Botswana, the quadratic model of life expectancy as function of GDP per capita (equation 1) is statistically validated (Table 1), for a significance threshold of 95%. In a graphic representation, the function is a flattened ∩-curve, meaning that life expectancy has limited growth when GDP per capita increases and after the maximum point, the economic growth cannot produce positive effects on the life expectancy.The evolution of the indicator 'Life expectancy' is explained in proportion of 40-97% by the evolution of GDP per capita, in selected countries, if all other factors are constant. Furthermore, life expectancy is positively associated with the evolution of GDP per capita, except Botswana and Lesotho (Table 2).

4.2. Education and economic output

In most of the selected countries (16 of 17), the correlation between education (expressed by the rate of secondary enrollment) and GDP per capita is strong and positive (0,8-0,94). In India the association of the two variables is moderate (0,4).

The increase of the enrollment rate in secondary education, in selected countries, during 1960-2010, could be explained by the dynamic of the income per capita, in proportion of 45-94%, if other factors are constant. The graphic representation of the function is a flattened ∩-curve.The model of quadratic function (equation 2) is statistically totally validated in 12 countries of 17 and in other 5 could not be validated for all coefficients, for a significance threshold of 95%.Therefore, this model has to be treated with precaution in further studies.

In reverse, I tested if the evolution of GDP per capita is significantly influenced by education. In the table 2, we can see that in a quadratic model (equation 3), the coefficients of multiple correlation show a strong association between ER (enrollment rate) and *y (*GDP per capita) and y^2 . But the model is statistically totally validated only in 5 countries and, in other 11, cannot be validated for all coefficients of the regression equation.

4.3. The effect of human capital accumulation in the economic output

The fourth model (equation 4) tests the effect of human capital (expressed by life expectancy and enrollment rate in secondary education) in the dynamics of GDP per capita. In all countries, the increase of GDP per capita could be explained in proportion of 69-94% by the increase of life expectancy and of enrollment rate, if other factors are constant, the multiple correlation being very strong. For 7 of 11 countries the model is totally validated and for 10, the model is only overall validated (not for all variables), for a significance thresold of 95%.

4.4. Life expectancy and education

As we can see in Table 2, for the selected countries, these variables are strongly and positively associated, except for Botswana and Lesotho, where life expectancy is negatively correlated with economic output.

As two components of human capital, life expectancy and education are interrelated and supportive for each other. A healthy and long life is an incentive for more education and more educated people are preserving their health status and have a longer life.

5. Conclusions and further research

In fast-growing countries, economic growth, expressed by GDP per capita, positively influences life expectancy and enrollment rates in secondary education. On the other hand, the assumption that human capital determines economic growth is verified. Both expressions of human capital, the enrollment rate in secondary education and the life expectancy, have a positive impact on GDP per capita. Education and life expectancy are positively and strongly associated in most countries.

For a significance thresold of 95%, a quadratic dependence of life expectancy on GDP per capita is validated for all regression variables. The rest of the models are overally validated, the validation for all variables being under discussion.

Based on these findings, other research can be conducted, for groups of developing and developed countries, by testing log models of aggregate income. Further researches are needed as well, to explore all the channels of economic growth through which accumulation of human capital can be stimulated in economy.

References

Barro, Robert,(1991) "Economic Growth in a Cross Section of Countries", *The Quarterly Journal of Economics,* MIT Press, Vol.106(2), pp.407-443.

Barro, R.J. and Lee, Jong-Wha (2000) *International Data on Educational Attainment: Updates and Implications,* Center for International Development at Harvard University, Working Paper 42, [Online], Available: http://www.cid.harvard.edu/cidwp/pdf/042.pdf [12 April 2012].

Barro, R.J. and Lee, Jong-Wha (2010) *A New Data Set on Educational Attainment World 1950-2010*, NBER Working Paper No 15902, [Online], Available: http://www.nber.org/papers/w15902.pdf [10 April 2012].
Barro, R., Sala-i-Martin, X.(1995) *Economic Growth*, McGraw-Hill, New York
Becker, G.S.(1994) *Comportamentul uman-o abordare economică*, Editura All, București.
Becker,G.S.(2007) *Health as human capital:Syntesis and extensions*, Oxford Econ Papers 59, pp.379-410.
Bils, M. and Klenow, P.(2009) "Does Schooling cause Growth?", *American Economic Review*, Vol.90, No 5, pp.1160-1180.
Birsdall, N., Pinckney, T. and Sabot, R (1999) *Natural resources, human capital and growth*, [Online], Available: http://tcpiii.tripod.com/wider.pdf. [16 April 2012].
Bloom,D.E, Canning,D., Sevilla J.(2001)*The Effect of Health on Economic Growth: Theory and Evidence*, NBER Working Paper No 8587, [Online], Available: http://www.nber.org/papers/w8587.pdf [12 April 2012].
Bloom,D.E, Canning,D., Sevilla J.(2004) "The Effect of Health on Economic Growth: A Production Approach", *World Development,* Vol.32 issue 1, pp.1-13.
Cohen, D., Soto, M.(2001*) Growth and human capital: Data good results*, Technical Paper No 57, OECD, [Online], Available: http://www.oecd.org/daraoecd/33/12/2669509.pdf [10 April 2012].
Grossman, M.(1972) "On the concept of health capital and the demand for health", *The Journal of Political Economy*, 80, pp. 223–255.
Grossman, M.(1999)*The Human Capital Model of Demand for Health* , NBER Working Paper No.7078, [Online], Available:http://www.nber/w7078.pdf [10 April 2012].
Hanushek, E., Dongwook, K.(1995) *Schooling, labour force quality and economic growth*, NBER Working Paper No. 5399, (http://www.nber.org/papers/w5399.pdf)
Hanushek, E., Kimko, D. (2000) "Schooling , labour force quality and the growth of nations", *American Economic Review* 90, No 5, pp.1184-1208.
Hanushek E.A., Woessmann, L. (2009) *Do Better Schools Lead to More Growth? CognitiveSkills, Economic Outcomes, and Causation*, NBER Working Paper No. 14633, [Online], Available: http://www.nber.org/papers/w14633.pdf [15 April 2012].
Hicks, N.L.(1987) 'Education and Economic Growth' in George Psacharopoulos(ed.), *Economics of Education*,Pergamon Press, 1987,pp.101-107.
Krueger, A.,B. and Lindahl, M.(2000) *Education for Growth: Why and for Whom*?. Cambridge: National Bureau of Economic Research, Working Paper No 7591, March 2000, [Online], Available: http://www.nber.org/papers/w7591.pdf [10 April 2012].
Lucas, Robert E.Jr., (1988) "On the Mechanics of Development Planning"*, Journal of Monetary Economics,* XXII,1, pp.3-42.
Mamuneas, Theofanis, P.; Stavvides, Andreas; Stengos, Thanasis (2006) "Economic Development and Return to Human Capital Investments: a smooth coeficient semiparametric Approach", *Journal of Applied Econometric,* Volume 21, Issue 1, pp.111-132.
Mankiw, N.Gregory and Romer, David and Weil, David N.(1992) "A contribution to the Empirics of Growth", *The Quarterly Journal of Economics*, MIT Press, Vol. 107(2), pp. 407-437.
Mushkin, Selma J.(1962) *Health as an Investment,* Journal of Political Economy, Vol.70, No.5, pp.129-157.

Neagu, O.(2010) *Capitalul uman și dezvoltarea economică*, Editura Risoprint, Cluj Napoca.
Romer, Paul, M.(1989)*Human Capital and Growth*, Working Paper No.3173, National Bureau of Economic Research, November, 1989, [Online], Available: http://www.nber.org/papers/w3173.pdf [15 April 2012].
Schultz, T.W.(1961) "Investments in human capital", A*merican Economic Review* 51, pp.1–17.
Schultz, T. W.(1962a) "Reflection on Investment in Man", *The Journal of Political Economy*, Vol.70,No.5 Part 2, Investment in Human Beings, Oct.1962, p.1-8.
Schultz, T.W. (1962b) *Investment in Human Beings*, University of Chicago Press, Chicago.
Schultz, T.P.,(1963)*The Economic Value of Education,* Columbia University Press,The European Institution for Life Long Learning, La théorie du capital humain et le gouvernement d'entreprise, pp.2-7.
Schultz, T.P.(2003)"Human capital, schooling and health", *Economics and Human Biol*ogy 1, pp.207-221.
Soto,M.(2009)*The causal effect of education on aggregate income*, Instituto de Analisis Economico, UAB, Barcelona Spain, [Online], Available: http://handle.digital.csic.es/bitstream/10261/17705/1/77909.pdf [15 April 2012].
Weil, D.N.(2005) *Accounting for the effect of health on economic growth*, NBER Working Paper No 11455, [Online], Available: http://www.nber.org/papers/w11455 [15 April 2012].
www.world.bank.org.

TABLES

Table 1: Regression statistics results (1)

Country	Botswana	Brazil	China	Colombia	Costa Rica	Dominican Republic
Eq.(1)LE (Life expectancy)						
Multiple R	0,27	0,95	0,63	0,96	0,95	0,94
R squared	0,07	0,92	0,4	0,92	0,93	0,89
No. observations	49	49	49	49	49	49
Coefficients						
Intercept	53,53	55,6	60,05	58,01	63,08	54,51
GDP	0,056	0,005	0,01	0,0067	0,0067	0,01
GDP squared	-0,01	-3,7E-07	-3,5E-06	-6,98E-07	-6,98E-07	-1,4E-06
Model validation	not valid	totally valid	totally valid	totally valid	totally valid	totally valid
Eq.(2)ER (Enrollment rate in secondary education)						
Multiple R	0,97	0,67	0,87	0,97	0,95	0,84
R squared	0,94	0,45	0,76	0,94	0,91	0,71
No. observations	40	40	40	40	40	40
Coefficients						
Intercept	2,08	26,65	41,35	20,45	29,78	25,51
GDP	0,02	0,01	0,02	0,025	0,06	0,01
GDP squared	-1,7E-06	-1E-07	-3,7E-06	-2,22E-06	5,5E-07	-8,1E-07
Model validation	overall valid	overall valid	totally valid	totally valid	totally valid	overall valid
Eq.(3) y (GDP per capita) (explained by ER)						
Multiple R	0,94	0,66	0,95	0,96	0,95	0,89
R square	0,89	0,44	0,92	0,93	0,90	0,79
No. observations	40	40	40	40	40	40

Coefficients						
Intercept	47,88	-3689,35	7331,06	1367,05	-2998,01	1623,06
ER	30,57	160,32	-304,87	-54,89	126,87	-65,88
ER squared	0,44	-0,75	3,19	1,01	-0,28	1,31
Model validation	overall valid	overall valid	totally valid	totally valid	overall valid	overall valid
Eq.(4)y (GDP per capita) (explained by LE and ER)						
Multiple R						
R squared	0,94	0,85	0,85	0,94	0,97	0,87
No. observations	0,88	0,72	0,83	0,88	0,94	0,77
Coefficients:	39	39	39	39	39	39
Intercept						
ER	27,04	-26092,21	-9624,94	7397,78	-12931,8	9669
LE	69,8	453,2	119,68	-158,59	166,17	151,09
Model validation	-9,44 overall valid	-12,9 overall valid	38,56 totally valid	92,11 overall valid	61,40 totally valid	28,42 totally valid

Source: author's calculations based on equations (1)-(4) by using Excel Data Analysis Tool

Table 1: Regression statistics results (2)

Country	Egypt	Hong Kong	India	Indonesia	Israel	Korea
(1)LE (Life expectancy)						
Multiple R	0,98	0,96	0,96	0,94	0,97	0,94
R squared	0,97	0,92	0,92	0,89	0,95	0,88
No. observations	49	49	49	43	49	49
Coefficients						
Intercept	44,23	70,33	42,28	50,44	69,8	60,32
GDP	0,02	0,0007	0,05	0,02	0,0008	0,002
GDP squared	-7,6E-06	-1,4E-08	-3,5E-05	-6,2E-06	-1,51E-08	-6,2E-08
Model validation	totally valid	totally valid	totally valid	totally valid	totally valid	totally valid
(2)ER (Enrollment rate in secondary education)						
Multiple R	0,96	0,90	0,85	0,88	0,93	0,86
R squared	0,93	0,82	0,73	0,78	0,87	0,75
No. observations	40	40	40	41	34	38
Coefficients						
Intercept	16,9	43,66	12,42	14,12	67,95	58,91
GDP	0,07	0,0033	0,09	0,049	0,003	0,0702
GDP squared	-1,9E-05	-7,2E-08	-6,2E-05	-1E-05	-9,46E-08	-2,7E-07
Model validation	totally valid	totally valid	totally valid	totally valid	totally valid	totally valid
Eq.(3) y (GDP per capita) (explained by ER)						
Multiple R	0,87	0,92	0,44	0,91	0,89	0,75
R square	0,75	0,86	0,19	0,83	0,90	0,56
No. observations	40	40	40	41	34	38
Coefficients						
Intercept	500,96	57383,02	-867,54	935,16	221099	20312
ER	-19,43	-2383,63	56,72	-49,78	-583,686	-725,239
ER squared	0,38	24,64	-0,55	0,94	39,10	6,38
Model validation	overall valid	totally valid	overall valid	totally valid	overall valid	overall valid
Eq.(4)y (GDP per capita) (explained by LE and ER)						
Multiple R						
R squared	0,93	0,97	0,92	0,83	0,96	0,96
No. observations	0,86	0,94	0,85	0,69	0,92	0,93
Coefficients:	39	39	39	40	34	38
Intercept						
ER	500,96	-270556	-420,97	-2736	-176679,2	-84629
LE	-19,43	3926,03	91,64	48,10	2524,31	1434,38
Model validation	0,38 totally valid	-282,75 totally valid	-18,8 totally valid	12,52 overall valid	-108,73 overall valid	-116,79 overall valid

Source: author's calculations based on equations (1)-(4) by using Excel Data Analysis Tool

Table 1: Regression statistics results (3)

Country	Lesotho	Malaysia	Pakistan	Thailand	Turkey
(1)LE (Life expectancy)					
Multiple R	0,64	0,96	0,96	0,95	0,96
R squared	0,42	0,93	0,93	0,90	0,93
No. observations	49	49	49	49	49
Coefficients					
Intercept	46,46	61,62	46,03	57,67	46,7
GDP	0,04	0,003	0,05	0,01	0,07
GDP squared	-6,3E-05	-3,3E-07	-3,4E-05	-2,4E-06	-5,5E-06
Model validation	totally valid	totally valid	totally valid	totally valid	totally valid
(2)ER (Enrollment rate in secondary education)					
Multiple R	0,94	0,83	0,92	0,90	0,93
R squared	0,89	0,70	0,84	0,81	0,86
No. observations	41	41	40	40	40
Coefficients					
Intercept	4,26	34,76	10,21	13,87	11,9
GDP	0,071	0,01	0,03	0,02	0,019
GDPsqd	-3,1E-05	-7,6E-07	-1,1E-05	-1,5E-06	-1,2E-06
Model validation	totally valid	totally valid	overall valid	overall valid	totally valid
Eq.(3) y (GDP per capita) (explained by ER)					
Multiple R	0,95	0,84	0,95	0,89	0,84
R squared	0,91	0,71	0,91	0,80	0,71
No. observations	41	41	40	40	40
Coefficients					
Intercept	104,78	-407,3	874,79	-556,59	-931,4
ER	-2,06	-50,77	-75,65	48,92	49,2
ER squared	0,43	1,94	2,31	0,045	0,49
Model validation	overall valid	overall valid	totally valid	overall valid	overall valid
Eq.(4)y (GDP per capita) (explained by LE and ER)					
Multiple R					
R squared	0,92	0,92	0,92	0,91	0,85
No. observations	0,86	0,85	0,84	0,84	0,73
Coefficients:	40	41	40	39	39
Intercept					
ER	63,04	-54501,2	-1519	-5225,58	-54792,33
LE	-3,04	888,87	23,88	75,12	79,98
Model validation	18,2	-78,37	21,89	37,47	74,08
	overall valid	overall valid	totally valid	overall valid	overall valid

Source: author's calculations based on equations (1)-(4) by using Excel Data Analysis Tool

Table 2: Partial correlation coefficients

Country	Correlation coefficient between GDP per capita and life expectancy	Correlation coefficient between GDP per capita and enrolment rate in secondary education	Correlation coefficient between life expectancy and enrolment rate in secondary education
Botswana	-0,27	0,94	-0,6
Brazil	0,87	0,64	0,82
China	0,49	0,80	0,63
Colombia	0,85	0,92	0,91
Costa Rica	0,87	0,95	0,75
Dominican Republic	0,85	0,84	0,85
Egypt	0,88	0,84	0,98
Hong Kong	0,93	0,83	0,92
India	0,81	0,41	0,83
Indonesia	0,83	0,82	0,97
Israel	0,95	0,86	0,91
Korea	0,89	0,69	0,83
Lesotho	-0,09	0,92	-0,30

Country	Correlation coefficient between GDP per capita and life expectancy	Correlation coefficient between GDP per capita and enrolment rate in secondary education	Correlation coefficient between life expectancy and enrolment rate in secondary education
Malaysia	0,89	0,83	0,96
Pakistan	0,85	0,91	0,89
Thailand	0,83	0,89	0,74
Turkey	0,85	0,84	0,95

Source: author's calculations, based on World Bank Data