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# HUMAN CAPITAL, LIFELONG LEARNING AND ECONOMIC PERFORMANCE

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## ABSTRACT:

The importance of human factor in attaining performance is recognized as a fundamental truth by most of the economists. Even not very old the theory of human capital became very consistent in latest time. Human capital consists in educational capital (skills acquired by individuals in the scholar teaching process, and lifelong learning) as well as from biological capital (physical abilities of the individuals, synthesized more often through the health state). The main advantage of human capital is the increased productivity of more skilled employees. Human capital reflects the quality of labor input. An analysis of Deutsche Bank Study shows that a 10% rise in human capital leads to a 9% rise in GDP per capita over the long run. The human capital can be measured as inputs: money spent on education, average time of enrolment and output: the increase in revenue of the employee. In this paper we made a statistical analysis on data from Human Development Index. The results show a medium strength relationship between GDP/capita and Adult Literacy Rate (correlation coefficient - 0,677) and between GDP/capita and Combined gross enrolment ratio (correlation coefficient - 0,765). Thus we can say that the theories of human capital have strong arguments to emphasize the important role of human capital in fostering long term GDP growth.

# I. INTRODUCTION

The aim of this paper is to present the concept of human capital and to analyze and argue its importance for the economic performance in general and for GDP growth in particular. The paper argue that education represent an investment in human capital that will pay on long term. The analyze is made on data from OECD databases, Human Development Index Report 2004 and EUROSTAT. They provide extensive information about the elements that compose human capital.

In the second part we define human capital and the components of Human Development Index.

The third part is dedicated to presenting the concept of training and lifelong learning.

The fourth part is analyzed the relationships between educational level, human development and economic performance.

Conclusions are drawn in the fifth part.

#### **II. HUMAN CAPITAL AND HUMAN DEVELOPMENT INDEX**

Human capital represents an important element for analyzing economic performance. It consists in individual's abilities that are characteristic to them and can be valuable on the labor market. Calitatea fortei de munca reflecta gradul de pregatire profesionala, fiind cunoscuta si sub denumirea de capital uman.

Human capital consists in educational capital (kills acquired by individuals in the scholar teaching process, and ...) as well as from biological capital (physical abilities of the individuals, synthesized more often through the health state). The main characteristic witch defines the human capital is the instruction degree of people even if that involves aspects that

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are related to the state of health of the population. According to the definition of Tom Schuller the human capital is defined as representing "the knowledge, skills, competences and other attributes embodied in individuals that are relevant to economic activity." (OCDE, 1998)<sup>1</sup>

Although a consistent theory of the human capital was elaborated late, in the second half of XX century, elements and ideas witch reflected acknowledgement of this concept can be found in the papers of the first important economists. So, Adam Smith was observing that "A man educated at the expense of much labor and time to any of those employments which require extraordinary dexterity and skill, may be compared to one of those expensive machines." (Smith, 1776)

The importance of human capital for the economic process is emphasized by other great economist, Alfred Marshall. He considered, in his work "Principles of political economy", that "the most valuable all capital is that invested in human beings." (Marshall, 1890)

The foundation of human capital theory was elaborated in '60, by a number of American economists, the most prominent of which were Theodore W. Schultz, Milton Friedman and Jacob Mincer. Its importance for economic theory was recognized through the awarding of Nobel Prize for contribution in this field. Thus Theodore W. Schultz was awarded in 1979 for contribution to growth theory based on human capital. Other Nobel Prize went to Gary Becker who developed this theory and then applied the methodological apparatus of economics to other social sciences. Becker demonstrated that investment in human capital, respectively in education, instruction and medical assistance lead to significant increase in labor productivity and finally to the growth of GDP.

At the microeconomic level the human capital theory is synthesized by the idea that individual income increase substantially with the higher level of education and training of people.

These theoretical concepts were put into practice in the development strategies both at the firm and the national economies level, and even at the regional structures as European Union. These strategies are those which can validate the theoretical demarche or can invalidate this in the opposite case. For instance in the European Employment Strategy the concept of human capital have a central place as an essential factor for an efficient functioning of the labor market. This strategy focuses on the areas where there are shortcomings of skills and to offer to all people the necessary skill to make all people competitive on the labor market. The way of doing this is the investment in training and long life learning.

Even it is difficult to asses accurately the human capital, the ways of measuring human capital are various:

- quantity and quality of human capital measured by the number of schooling years

- the percent of GDP spent for education

- ratio of schooling, results, performances

- differences in income due to different education

An indicator used for assessing the quality of life, but which is related with human capital is Human Development Index (HDI), proposed by United Nations Organization. It is a complex indicator calculated by aggregating three others. They are:

1. GDP/capita at Parity Purchasing Power – measure the average level of the material resources an individual have for his basic needs.

2. Literacy rate – the percent of adults (age more that 15 years) who can write and read simple propositions about their daily life. It measures the ratio of the people who went to school and reflect indirectly the knowledge level of individuals.

<sup>&</sup>lt;sup>1</sup> Tom Schuller – Les rôle complémentaires du capital humain et du capital social, www.OCDE.org



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3. Life expectancy at birth - is defined as the number of years a new born would live if the mortality causes would remain unchanged. It takes into account the level of sanitary conditions, the level and quality of medical assistance, etc.

An important part of knowledge, qualifications is acquired in school, through the instruction, and thus it contributes to development of human capital. In order to maximize the effects of education on human capital development the differences between incomes hate to correspond to differences in human capital.

## III. TRAINING AND LIFELOG LEARNING

A definition of training is "the systematic development of the knowledge/attitude/skill/behaviour pattern required by an individual to perform adequately a given task or job." (Department of Employment Glossary of Training Terms, 1971)

The training can be viewed from two points of view. On the one hand there is an individualistic approach of this process in which is emphasized the skills acquisition regardless the context people are working in.<sup>2</sup> The training process success, and the formation of human capital is reflected by the increasing performances at the workplace.

On the other hand there is an approach that emphasizes the organizational development and performances. The training is defined from this perspective as "Any organizationally initiated procedures which are intended to foster learning amongst organizational members in a direction contributing to organizational effectiveness." (Hinrichs, 1976)

Other writers place emphasis on the processes involved in the training activity. Goldstein (1986) defines training as "The systematic acquisition of skills, rules, concepts, or attitudes that result in improved performance in another environment.", which is, from our perspective, the working environment.

Training is a consciousness learning method used for attaining the following main goals:

- knowledge acquisition
- skills gaining
- behavior shaping

Other concept regarding human capital is lifelong learning. According to Eurostat, lifelong learning refers to persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the survey. This number is related to the total population of the same age group, excluding those who did not answer the question on 'participation in education and training'. This concept relates to all education or training of people whether it is or it is not useful for the respondent's current job. The importance of lifelong learning for the competitiveness of European Union Economy is emphasized by the Lisbon European Council which confirmed this as "a basic component of the European social model". The value of this indicator is presented in Table 1.

We can see that in the most cases the number of people who participate at training increase in time. On the other hand this indicator is higher in Nordic countries which show the best economic performances. The former communist countries which entered in the European Union in 2004 show medium value figures those are consistent with their performances. In Romania and Bulgaria the percentages of the adult population participating in education and training are between 1 - 2 % three or four times lower that in other former communist countries and more that ten times lower than in the most developed European

 $<sup>^{2}</sup>$  This definition is used mainly by human resources specialists who emphasize individual learning, behavior and performance. (n.a.)

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countries.

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Year						
Country	1999	2000	2001	2002	2003	2004
Belgium	6,9	6,8	73	6,5	8,5	9,5
Czech Republic				5,9	5,4	6,3
Denmark	19,8	20,8	17,8	18,4	25,7	27,6
Germany	5,5	5,2	5,2	5,8	6,0	6,0
Estonia	6,5	6	5,2	5,2	6,2	6,7
Greece	1,2	1,1	1,4	1,2	3,7	3,7
Spain	5,1	5,1	4,9	5	5,8	5,2
France	2,6	2,8	2,7	2,7	7,4	7,8
Ireland				7,7	9,7	7,2
Italy	5,5	5,5	5,1	4,6	4,7	4,7
Cyprus	2,6	3,1	3,4	3,7	7,9	9,3
Latvia				8,2	8,1	9,1
Lithuania	3,9	2,8	3,6	3,3	4,5	6,5
Luxembourg	5,3	4,8	5,3	7,7	6,3	6,3
Hungary	2,9	3,1	3	3,2	6,0	4,6
Malta		4,5	4,6	4,4	4,2	5,0
Netherlands	13,6	15,6	16,3	16,4	16,5	16,5
Austria	9,1	8,3	8,2	7,5	12,5	12
Poland			4,8	4,3	5	5,5
Portugal	3,4	3,4	3,4	2,9	3,7	4,8
Slovenia			7,6	9,1	15,1	17,9
Slovakia				9	4,8	4,6
Finland	17,6	19,6	19,3	18,9	25,3	24,6
Sweden	25,8	21,6	17,5	18,4	34,2	35,8
United Kingdom	19,2	21,1	21,7	22,3	21,3	21,3
Bulgaria			1,4	1,3	1,4	1,3
Romania	0,8	0,9	1,1	1,1	1,3	1,6
Iceland	20,2	23,5	23,5	24	24,0	
Norway		13,3	14,2	13,3	19,6	19,1

Table 1. Lifelong learning - Percentage of the adult population participating in education and training

Source: Eurostat

Other measure of human capital is based on the expenditure on education. This indicator is measured as the total public expenditure on education as a percentage of GDP. Data from European countries are presented in Figure 1. Again the ranking is very similar with that representing the lifelong learning. Values about 7 - 8% are found in Nordic countries, while Bulgaria and Romania are at the end of the scale.

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Fig. 1 Total public expenditure on education as a percentage of GDP, in 2002 (%) Source: Eurostat

High amount of expenditure for education does not reflect a high level or an important increase of human capital. The efficiency of this investment depends on the quality of this process. Other measure of human capital is the average years of education of the working-age population. The values of this indicator in the world are shown in Fig. 2.





Fig. 2 Average years of education of the working-age population in 2000 Source: OECD **IV. EDUCATIONAL LEVEL, HUMAN DEVELOPMENT AND ECONOMIC PERFORMANCE** 

Learning is no longer given weight only in the area of education; it is also seen as a critical factor in the areas of employment and social security, economic performance and competitiveness extended to the whole life cycle.

Education, training and lifelong learning play an important role for the European Union long term strategy. The objectives established at Lisbon emphasize the necessity of knowledge creation and diffusion, and this can be done by improvements in education and vocational training and lifelong learning. In order to be effective the educational offer has to match the actual and future requirements on the labor market.

Official data shows that the EU-15 Member States spent in 2003 a more than 25 billion Euros on training measures for the unemployed and other disadvantaged groups on the labor market.

But the human capital deals not only with education expenditures and labor force training. It is concerned also with public health, basic education, environment protection, public order, etc. All these expenditures depend largely on public budget, and thus the human capital investments represent a major public long term option.

The most obvious advantage of human capital is the increased productivity of more skilled employees. Others refer to more flexibility on the labor market and even a better cooperative capability of more educated people. The empirical analysis of a panel estimates from a Deutsche Bank Study shows that a 10% rise in human capital leads to a 9% rise in GDP per capita over the long run.

In order to be useful human capital has to reflect the quality of labor input. But often the average years spent in school do not reflect how much is actually learned during that time. An attempt to correct this failure is to asses the quantity and quality of knowledge gained and was made by the OECD. It was tested an questionnaire - Program for International Student Assessment – PISA.

The data used for the statistical analyze were found in the Human Development Report and are shown in Table 2.

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Table. 2 Liements of the Human Capital, and GDF per capita, across the world, 2002									
Region	Life expectancy (years)	Adult literacy rate (%)	Combined gross enrolment ratio for primary, secondary and tertiary schools 2001/2002 (%)	GDP per capita (PPP US\$)					
Least developed countries	50,6	52,5	43	1.307					
Arab States	66,3	63,3	60	5.069					
East Asia and the Pacific	69,8	90,3	65	4.768					
Latin America and the Caribbean	70,5	88,6	81	7.223					
South Asia	63,2	57,6	54	2.658					
Sub-Saharan Africa	46,3	63,2	44	1.790					
Central and Eastern Europe and the CIS	69,5	99,3	79	7.192					
OECD	77,1		87	24.904					

Table. 2 Elements of the Human Capital, and GDP per capita, across the world, 2002

Source: Human Development Report, hdr.undp.org/reports/global/2004

The analyzes consists in determining the correlation between human capital elements and GDP/capita.

The correlation coefficient between GDP/capita and Adult Literacy Rate is 0,677, and R-square is 0,46 indicating the variation of GDP/capita that can be explained by the variation of literacy rate.



Fig. 3. The linear regression between literacy rate and GDP/capita.

The correlation coefficient<sup>3</sup> between GDP/capita and Combined gross enrolment ratio for primary, secondary and tertiary schools is 0,765, and R-square is 0,59.

<sup>&</sup>lt;sup>3</sup> Correlation is significant at the 0.05 level (2-tailed).



Fig. 4. The linear regression between gross enrolment ratio and GDP/capita.

The correlation coefficient between GDP/capita and Life expectancy is 0,697, and R-square is 0,49.



Fig. 5. The linear regression between life expectancy and GDP/capita.

The analysis can be made on indexes of these variables. They are presented in Table 4.

Table. 4 Elements of the Human Development Index, across the world, 2002

Region	Life expectancy index	Education index	GDP index	Human Development Index
Least developed countries	0,43	0,49	0,42	0,446
Arab States	0,69	0,61	0,65	0,651
East Asia and the Pacific	0,75	0,83	0,64	0,74
Latin America and the Caribbean	0,76	0,86	0,72	0,777
South Asia	0,64	0,57	0,55	0,584
Sub-Saharan Africa	0,35	0,56	0,48	0,465
Central and Eastern Europe and the CIS	0,74	0,93	0,72	0,796
OECD	0,87	0,94	0,92	0,911

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Source: Human Development Report, hdr.undp.org/reports/global/2004

The correlation coefficient<sup>4</sup> between GDP index and Education Index is 0,879, and R-square is 0,77.



Fig. 6. The linear regression between education index and GDP index.

## **V. CONCLUSIONS**

<sup>&</sup>lt;sup>4</sup> Correlation is significant at the 0.01 level (2-tailed)

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In conclusion we can say that the theories of human capital have strong arguments to emphasize the important role of human capital in fostering GDP growth. The main element of human capital is education, both basic instruction and lifelong learning. Even if human capital theories are relatively new, ideas about the importance of human factor, skills and training can be found in the works of many economists from the beginning of the economics as science. The impact of human capital on economic performance is obvious at the macroeconomic level. The data analyzes show the strong correlation between GDP/capita and the elements of human capital. The theories of economic growth cannot neglect any longer this factor.

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