RELATIONSHIP BETWEEN ECONOMIC GROWTH AND HUMAN CAPITAL

CATEGORIES OF INDICATORS

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Abstract

Recognizing the importance of influence exerted by human capital on economic growth of a country, to base decisions regarding the need to invest in such type of capital there are conducted studies and used different models for analysis related to a series of macroeconomic and demographic indicators.

We present the main indicators and dynamics of human capital, placed in the economic context of Romania, with reference, in bringing out statistics data, to an average period of time (between 1994-2008) characterized at macroeconomic level, both by recession and economic growth periods.
There were also highlighted indicators and dynamics, both at national and individual level.

Keywords: human capital, indicators of human capital, dynamics of human capital, macroeconomic indicators, individual indicators

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In a market economy it is necessary, in our view, regardless of activity domain, a process of conscious economic adjustment, aimed at reducing the amplitude of oscillations between demand and supply, the process resulted in the establishment of a favourable legal framework, the use of economic and financial levers, as well as some prevision, by which the activity is anticipated and guided. One can say that various types of prevision - prognoses, strategies and socio-economic policies, plans, programs and projects – have a complementary nature to the market mechanism, supporting it and enhancing its valences, by reducing the risk and uncertainty. At the same time, the previsions can contribute to solving interrelated economic, social and environmental matters by developing the capacity to address these issues in an integrated manner and a global perspective, thus contributing to the durable development of the country.

In determining the period of time for what the main indicators and dynamics of human capital are presented, we started from the following considerations:

- in the last decade, Romania has experienced a fairly turbulent macroeconomic way with episodes of recession (1990-1992, 1997-1999, 2009-present), return (1993-1996) and growth (2000-2008);

- the most important reforms started only in 1997, as mentioned in the monograph on professional training and employment services in Romania (by European Training Foundation - ETF);

- the effects of investment in educational capital (the most important component of human capital) are visible on the medium and long term;

- lack of data or inconsistent data from different sources as well as reviewing the definitions and coverage domain for a data series aiming at, in particular, labour power (in 2002), making it impossible to compare with previous years data series.

Given all these issues we considered the period 1993-2008 is representative of a study on human capital, except that not all statistics presented cover the whole period.

The evolution of main macroeconomic indicators characterizing socio-economic development of Romania during 1993-2008.

in percentage

	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Real GDP growth	1,5	3,9	7,1	3,9	-6,6	-5,4	-3,2	1,6	5,3	4,9	4,9	7,5	4,2	7,9	6,3	7,3
Inflation	295,0	61,7	27,8	57,0	151,0	40,6	51,4	40,7	30,3	17,8	14,1	9,6	9,1	6,6	4,9	7,9
Unemp-loyment	10,4	10,9	9,5	6,6	8,8	10,3	11,5	10,5	8,6	8,1	7,6	7,0	7,2	7,3	6,4	5,8
Gross fixed capital formation, %GDP\	17,9	20,3	21,4	23,0	21,2	18,2	17,7	18,9	20,5	21,1	23,5	24,0	23,0	26,0	30,0	33,0
Deficit / GDP	2,6	4,2	4,1	5,0	3,6	2,8	2,5	3,6	3,1	2,5	2,4	1,6	7,5	3,0	3,8	3,9

The main demographic indicators in the years 1993-2008

	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Population (million)	22,75	22,73	22,68	22,61	22,54	22,53	22,49	22,44	22,4	21,8	21,7	21,7	21,65	21,61	21,56	21,53
Natural increase of population	-13,3	-19,4	-35,0	-54,8	-42,4	-31,9	-30,59	-21,3	-39,2	-59,1	-54,1	-	-41,1	-38,6	-37,3	-31,3

Source: National Institute of Statistics.
Social Trends – NIS – UNICEF, Bucharest, 1998;
Romania in figures – NIS, Bucharest, 2005

It results that reducing of the natural increase caused the decrease of absolute number of people, taking place major changes in the structure of the population by age groups. The average age of the population has increased in recent years, reaching in 2004 to 38.3 years, an age that characterizes the adult population countries, this age is higher in the female population, and, respectively, in the rural areas. It is estimated that by 2020, while maintaining constant the level of the main events, the Romanian population will diminish by almost 2.9 million inhabitants, the reduction being particularly marked in relation to school-age population.

Correlating respective indicators with the indicators of material resources shown above (providing a picture of the economic development of society) it can say that the presence of well-educated and with a healthy condition human resources causes a high productivity of labour, a better organization of economic activity, a higher production and higher incomes which in turn allow new investments in education and health, causing the production of a better educated and healthy human resources.

Referring to human capital we should keep in mind, in particular, its two components namely: biological capital and educational capital.

Biological capital consists of physical abilities of individuals, most often synthesized by **health**.

At the aggregate level, many indicators can be used to characterize the health of a group, community or society, but those most often found in international statistics are tied to life expectancy, mortality by age groups and incidence of some diseases, usually associated with poverty (tuberculosis) or contemporary epidemics (HIV / AIDS, SARS, etc.).

Regarding *life expectancy*, this indicator reflects quite accurately the effect of care accumulated over many generations, depending on a complex of factors related to economic development, living standards, cultural traditions regarding medical treatment etc.

Life expectancy in the period 1991-2008

	1991-1993	**1992-1994**	**1993-1995**	**1994-1996**	**1995-1997**	**1996-1998**	**1998-2000**	**1999-2001**	**2000-2 2002**	**2001-2003**	**2002-2004**	**2004-2006**	**2006-2008**
Life expectancy	69,52	69,48	69,40	69,05	68,95	69,20	70,6	71,25	71,3	71,1	71,4	72	72,75

Source: National Institute of Statistics
Social Trends – NIS – UNICEF, Bucharest, 1998;

It results that life expectancy has experienced a decrease until 1997, after which, with economic growth, has taken a slightly upward trend.

Of indicators that reflect the extent to which medical care that most people have access ensures good health, we mention: *mortality rate* (calculated as the number of deaths per 1000 inhabitants) and *infant mortality* (representing the number of deaths under one year to 1000 live births). These indicators may be associated *birth rate* (per 1000 inhabitants), reflecting both the effect of education, progress of medicine and health system development and the quality of life and social development levels.

Health indicators in the years 1993-2008

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Mortality rate	11,6	11,7	12,0	12,7	12,4	12,0	9,1	8,9	9,0	9,8	9,7	11,9	12,1	12,0	11,7	11,8
Infant mortality rate	23,2	23,9	21,2	22,3	22,0	20,5	15,2	16,1	15,6	14,5	13,7	16,8	15,0	13,9	12,0	11,0
Birth rate	11,0	10,9	10,4	10,2	10,5	10,5	8,9	8,09	8,4	8,5	8,7	10,0	10,2	10,2	10,0	10,3

Source: National Institute of Statistics
Social Trends – NIS – UNICEF, Bucharest, 1998;

Birth rate had a very low level making the final descent of the younger generations to remove more from necessary level of simple replacement of generations. Also it results a very high rate of general and infant mortality.

Regarding **educational capital,** it can be argued that this conditions economic progress but it is also determined by it. Indicators reflecting the accumulated stock of education are, however, difficult to determine, especially if we consider the aspect of non-formal and informal or qualitative aspect of it.

We present the most important indicators covering the formal and quantitative component of educational capital.

Based on financial resources from public and private contributions to education and professional training, there are presented in Table 5 the public expenditure on education. Although the law stipulates that a minimum rate of 4% of GDP to be allocated to education, the education system was a long time under-funded, the objective being achieved only in recent years. However, we can say that investment in education remains very low in real and relative terms. Following a temporary increase of participation in education, by extension of compulsory education from 8 to 10 years, it should consider education as a national priority in the next period, while implementing a strategy of decentralizing education and mobilization of financial resources.

Public expenditure on education in the years 1993-2008

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
As % of GDP	3,2	3,1	3,4	3,6	3,3	3,6	3,4	3,4	3,1	3,0	3,5	3,4	3,5	4,3	5,5	6,0
% of total public expenditure	-	-	-	13,5	13,0	13,2	10,9	14.0	15,6	-	8,2	-	-	8,8	17,54	-

Source: National Institute of Statistics
Social Trends – NIS – UNICEF, Bucharest, 1998;
Romania in figures – NIS, Bucharest, 2005
ETF data base

Another aspect of funding education is related to the distribution of expenditures by level of education, given the different importance that funding represents it, depending on educational level, for society or for individual. Information on this issue can be obtained by aggregating of existing data: the share of expenditure for higher education in total public expenditure on education, respectively, the evolution of average cost / pre-university student, in conjunction with the school population.

Public expenditure on higher education in the period 1993-2007

	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
% of public expenditure on education	11,7	14,0	14,2	17,8	15,9	18,6	-	-	-	-	-	-	22,8	22,1

Source: Social Trends – NIS – UNICEF, Bucharest

Public expenditure on pre-university education in the period 1993-2008

absolute data

	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Average cost / student *)	180	217	222	163	202	-	-	-	232	279,66	291,42	339,16	486	682	855
Total students (thousands)	4319	4339	4367	4333	4282	-	-	-	4554	4497	4473	4404	4361	4346	4405

**) expressed in: USD (period 1993-2001) and EURO (period 2002-2008)*
Source: National Institute of Statistics
Social Trends – NIS – UNICEF, Bucharest, 1998;

The main indicators regarding the *participation in education and professional training* are: the school population by educational levels and school enrolment rate by educational levels.

Another indicator used in international statistics is the *participation rate in education of young people aged between 15 and 24 years.* According to EUROSTAT data base, in the year 2003 (reference for university education due to its restructuring and increase the duration of compulsory education), Romania is placed at a rate of 41.9%, below the average EU countries -15 (57.4 %) and countries of the region: Hungary (51.6%) and Poland (63.4%). It has not to be neglected the qualitative aspect of education in Romania, compared with recorded performances of education systems in Europe.

School population by educational levels in the period 1993-2004, number

	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
School population in which:	4569285	4594513	4703277	4688311	4643351	4631164	4578383	4565279	4554466	4496786	4472493
Preschool education	712136	715514	697888	659226	623553	624778	616313	611036	616014	629703	636709
Primary and gymnasium education	2533491	2532169	2541945	2546231	2559766	2556930	2498139	2411505	2320536	2198312	2122226
High school education	722421	757673	787211	792788	765903	718017	694376	687919	710663	740404	758917
Vocational education	300443	288674	285450	262057	247239	227585	222234	239550	252347	270215	279124
Post high school education	50707	45321	54642	73521	86300	96134	94700	82117	72685	61855	54732
Higher education	250087	255162	336141	354488	360590	407720	452621	533152	582221	596297	620785

Source: National Institute of Statistics
Social Trends – NIS – UNICEF, Bucharest, 1998;

School enrolment rate by educational levels in the period 1993-2008

	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Primary education	96,9	99,7	99,5	99,1	97,5	99,8	95,5	94,2	97,2	96,5	98,2	106,1	103,8	97,8	97,3
Gymnasium education	86,5	84,3	86,7	86,4	92,3	94,3	96,9	95,5	93,2	94,1	94,2	97,4	96,7	100,5	99,5
High school and vocational education	63,7	66,1	68,6	69,1	68,6	67,8	65,9	74,6	73,9	73,7	73,0	75	80	84,9	89,3
Higher education *)	22,7	22,7	20,9	22,2	22,7	25,4	28,9	32,9	36,4	40,7	43,3	47,5	49,5	56,3	54,9

**) including non-university tertiary education (Post high school education)*
Source: National Institute of Statistics: www.insse.ro;
Social Trends – NIS – UNICEF, Bucharest, 1998;
Romania in figures – NIS, Bucharest, 2005

Training participation rate of population aged 25-64 years

(period 1997-2008)

	1997	1998	1999	2000	2001	2002	2004	2006	2008
UK	-	-	19,2	21,1	21,7	22,3	29	26,7	19,9
EU -15	**5,8**	**-**	**8,2**	**8,5**	**8,4**	**8,5**	**10,7**	**11,2**	**10,9**
Spain	4,5	4,3	5,1	5,1	4,9	5,0	4,7	10,4	10,4
Poland	-	-	-	-	4,8	4,3	5	4,7	4,7
Hungary	2,99	3,3	2,9	3,1	3,0	3,3	4	3,8	3,1
Romania	0,9	1,0	0,8	0,9	1,1	1,1	1,4	1,3	1,5

Source: EUROSTAT

For *workplace training*, according to EUROSTAT data, Romanian companies invest on average only 0.5% of the human resources in vocational training, which is the lowest among countries in the region (Czech Republic – 1.9%, Hungary – 1.2%, the average EU countries – 1.15%).

To provide sufficient information on educational capital it is added formal unauthorized components, of which the most important are the use of computers, Internet access and use (with indicators such as, for example: the level of investment in information and communication technology - ICT).

Indicators have to be corroborate with **key indicators of labour power**. Data are presented only for the period 2001-2008, because they are not comparable with data series from previous years.

Key indicators of labour power in the years 2001-2008, thousand of persons

	2001	2002	2003	2004	2005	2006	2007	2008
Active population	11447	10079	9915	9957	9851	10041	9994	9944
Employed population	10697	9234	9223	9158	9147	9313	9353	9369
Unemployed ILO (in accordance with methodology of International Labour Office)	750	845	692	799	704	728	641	575

Source: Romania in figures – NIS, Bucharest, 2005

1990 was characterized by the highest migration rate in the last decades (33.9% 0). Profound transformations in the socio-political system in Romania after 1989, which led to the emergence of rules that favour the free movement of persons, constituted/represented the premises of an unprecedented growth of the level of international migration (particularly emigration) at the beginning of the decade.

Indicators of internal and external migration in the years 1993-2008

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Internal migration rate (1000 inhabitants)	10,6	11,7	12,8	13,0	13,4	12,3	-	-	12,7	14,7	15,3	17,1	12,6	15,5	17,4	18,1
Emigration rate (1000 inhabitants)	0,81	0,75	1,13	0,95	0,88	0,78	-	-	9,9	8,2	10,7	13,1	10,9	14,2	8,8	8,7

Other categories of indicators

At the individual level, the main indicator is the monthly personal income of an individual, correlated with his level of training.

In general, in European countries, income level is well related with level of training (education). There is an increasing trend, although the relationship is influenced by many factors such as age, individual skills, inherited wealth, distributional inequities etc.

The relationship between education and income at the individual level in Europe

Level of education	Income decile									
	1	2	3	4	5	6	7	8	9	10
Primary	**31%**	**24%**	17%	12%	7%	4%	3%	1%	1%	1%
Gymnasium	13%	**20%**	**23%**	17%	11%	7%	5%	2%	2%	1%
Lower secondary – level 1 qualification	15%	13%	**16%**	**16%**	14%	10%	8%	4%	2%	2%
Secondary – level 2 qualification	7%	8%	10%	11%	10%	**13%**	**14%**	11%	10%	8%
Upper secondary – level 3 qualification	7%	10%	12%	**15%**	**16%**	10%	10%	8%	5%	5%
Tertiary non-university	4%	5%	8%	10%	12%	**15%**	**14%**	**14%**	9%	9%
University	5%	5%	9%	11%	**13%**	**13%**	11%	11%	9%	**14%**

Source: EVS 1999

From researches undertaken in Romania result the same relationship, although the groups given by level of education are not homogeneous in terms of income, especially for categories that have a lower education level.

The relationship between education and income at the individual level in Romania

Level of education	Monthly personal income (millions lei)				
	Average	Median	Maximum	Standard deviation	Coefficient of variation
Without education	0,7	0,5	2,5	0,7	106%
Primary	1,2	1,0	8,0	1,1	91%
Gymnasium	1,6	1,4	10,0	1,4	87%
Lower secondary	1,9	1,8	12,0	2,0	103%
Vocational	2,5	2,4	12,0	1,8	75%
Upper secondary (high school)	2,6	2,5	35,0	2,9	111%
Tertiary non-university (Post high school)	3,9	3,0	20,0	3,1	80%
University – short duration	5,2	4,5	20,0	3,9	75%
University – long duration	5,2	4,0	25,0	3,8	73%

Source: BOP – OSF – october 2003

Correlations are also confirmed by statistic data, resulting that the higher income is received by employees working in banking, financial and insurance activities, as well as in public administration, post and telecommunications, where are usually imposed studies conditions, too.

Salary disparities are also evident in urban areas compared to rural areas, as well as on the macro-regions of socio-economic development.

Another factor that expresses strong impact on the *level of education* attained by an individual is the education level of parents. Studies show that socio-cultural structures are reproduced so that the present educational structure will depend on the past, people from educated families tend to become more educated and vice versa. Also it results an increase of the average level of school training, the trend being determined by cultural modernization, technological progress, quality of life and level of aspiration etc.

The relationship between education of parents and highest level of education attained, according to research BOP - OSF (Public Opinion Barometer – Open Society Foundation) in October 2003, on a sample of the population aged over 25 years (whose studies are generally completed), is presented below.

The relationship between education of parents and highest level of education attained

in percentage

Education level of the subject	Education level of most educated parent						Total
	Primary	Gymnasium	Lower secondary	Upper secondary (high school)	Tertiary non-university	University and post university	
Primary	**27**	3	1	2	3	0	14
Gymnasium	**29**	19	7	2	0	0	20
Lower secondary	26	**31**	26	7	12	0	25
Upper secondary (high school)	11	**28**	**38**	**37**	22	21	21
Tertiary non-university	5	12	**19**	**23**	**29**	15	11
University and post university	2	7	10	**29**	**35**	**64**	9
Total	100	100	100	100	100	100	100
	46	28	12	7	5	3	100

From statistical data also follows that employment status and level of education of household head significantly influences the level and structure of disposable income, being an important factor of poverty distribution. Integrated survey in households conducted by the National Institute of Statistics - NIS shows that the most exposed at risk of poverty are members of households headed by unemployed or farmers (60%), while members of employers households are the least exposed to below the poverty line (10%). In terms of education level, the survey shows that households headed by graduates from primary, lower secondary or vocational education are greater below the poverty line (40%), the risk of these categories of members to be in the poor category is double that of households headed by persons with secondary education. The least affected by poverty are members of families where the reference person has university education, with a constant poverty rate of about 5-7 times lesser than the overall average.

In the case of aggregate indicators, it is worth highlighting the importance that may have information on the extent to which individuals possess skills related to the use of information and communication technology as well as communication skills in one or more languages.

Conclusion

The evolution of categories of indicators presented leads to the conclusion that the decision to invest in human capital influences significantly the level of socio-economic development of a country, justifying the approach of such an investment not only as an individual decision or at the level of an organization but also having in attention its implication at macroeconomic level.

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