

Centre for European Studies, Alexandru Ioan Cuza University of Iași, Romania

**Ramona Frunză • Gabriela Carmen Pascariu • Teodor Moga**

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# **THE EU AS A MODEL OF SOFT POWER IN THE EASTERN NEIGHBOURHOOD**



EDITURA UNIVERSITĂȚII „ALEXANDRU IOAN CUZA” IAȘI

**Ramona FRUNZĂ**

**Gabriela Carmen PASCARIU**  
(coordinators)

**Teodor MOGA**

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700109 – Iași, str. Pinului, nr. 1A, tel./fax: (0232) 314947  
[http:// www.editura.uaic.ro](http://www.editura.uaic.ro) e-mail: [editura@uaic.ro](mailto:editura@uaic.ro)

# THE PATH TOWARDS COHESION: REFLECTIONS ON RESEARCH AND DEVELOPMENT SECTOR IN THE EUROPEAN UNION

Ramona FRUNZĂ (ȚIGĂNAȘU)

Alexandru Ioan Cuza University of Iasi, Romania

ramona.frunza@uaic.ro

Gabriela Carmen PASCARIU

Alexandru Ioan Cuza University of Iasi, Romania

gcpas@uaic.ro

**Abstract:** *The reducing of the development gaps is a goal pursued by all emerging European states in the common effort to achieve an increased cohesion. The ways through which the economic disparities could be diminished are varied but in this paper we will focus on the importance of scientific research. The target of allocating at least 3% of GDP, from both public and private sources, for research and development (R&D) activities, stipulated in the EU 2020 Strategy, represents a fundamental milestone in our analysis, the main purpose being to answer to the following questions: Which is the potential of convergence on scientific research line of the least developed countries in the EU27?; How does the Cohesion Policy, through the structural funds, improve the quality of scientific research?; Which are the perspectives of cooperation between the research institutes and the private sector in order to generate a higher level of innovation in society?; It is possible to create new innovative clusters in Romania, bringing added value to the economy and thus reducing the development discrepancies? Answering these questions in a comparative manner, it will be emphasized the need for giving a major significance to scientific research, especially through a sufficient funding in all countries.*

**Keywords:** cohesion, scientific research, innovation, competitiveness, European Union

## 1. STATE OF THE ART ON HUMAN RESOURCES MATTER

In the actual context of economic development, human resources are essential elements of competition, both nationally and internationally. In a competitive, computerized, global economy, the quality of human resources is the main factor underlying the differences between states. In what is concerning the concept of “human capital”, it is used, in the incipient stage, in the classical economic school, at Adam Smith, who appreciate that “a man who spent a lot of work and time in training must prove a higher level of skill and dexterity, being compared with an expensive car, but with great performances. The investment in

human resources means the increasing of the results. For example, an untrained worker in the production of needles could do with all his diligence only one needle per day and no doubt he could not make twenty” (Pohoată, 2007, p. 4). In the paper *Principles of Political Economy*, the representative of neoclassical school, Alfred Marshall, considered “the most valuable of all is the capital invested in the human being” (Marshall, 1890). Although it has only known assertion and conceptual structure after the 7<sup>th</sup> decade of the XX century, the term of human capital was used much earlier in economy. Two methods were used in order to estimate the monetary value of the human being: the procedure of production cost and that of capitalized incomes. The first method resides in estimating the net costs of human being “production” in its development, excluding the maintenance costs, William Petty and Ernst Engel being among the promoters. The second method consists in evaluating the present value of past and future incomes of individuals, Shield Nicholson and Alfred de Foville were those who used the method (ICCV, 2009). The modern theory of the social capital was developed around the intellectual group from the Chicago University, coordinated by Theodore Schultz<sup>1</sup>, president of the American Economy Association. Postulating the rationalization of individuals, Schultz and his collaborators treated the educational and health expenses as investments with the purpose of increasing work productivity and generating economic growth. Jacob Mincer, Gary Becker and those who followed them focused especially on the study of relationships between the human capital and the work incomes, more exactly on the analysis of incomes variations according to the individuals’ degree of education. This is the object of human capital theory, whose remarkable exposal is achieved by G. Becker (1962, 1994)<sup>2</sup>. The theory essence is simple: the incomes of people substantially grow according to their degree of education. The author demonstrates that the investment in human capital, education, training and healthcare generates the largest increase in labor productivity and has an important contribution to growing of GDP. Thus, the human capital is a mean of production in which investments may lead further increasing production (Skelton and Gorard, 2011; Lubinski et al., 2006; Krueger and Lindahl, 2000; Frunză, 2010). Mincer and Becker have generally restricted their approaches regarding the human capital when analyzed the educational capital<sup>3</sup>, emphasizing the costs

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<sup>1</sup> In 1963, Theodore W. Schultz, Nobel Prize winner (1979) for contribution to growth theory evaluated in the light of human capital, published the paper “The Economic Value of Education” and in 1971 “Investment in Human Capital”.

<sup>2</sup> On the ground of economy, the best interpretation of human capital belongs to G. Becker, Nobel Prize winner for Economics in 1992, for his work and analysis on the role of human capital in the economic growth.

<sup>3</sup> The educational capital is presented in two distinguished forms: on the one hand it represents the abilities acquired after participating to formal educational systems, knowledge certified by diplomas; and on the other hand it is any other knowledge and

associated to the training investment, and the relationship between school and post-school investments.

In the last decades, the analyses regarding the human capital have begun defining it as educational capital especially as a result of the human capital theory impact. The education represents in fact the essence of human capital, its importance being superior to the components associated to the state of health (Bedrule-Grigoruță, 2006). More than ever, the performances obtained through human development depend on the production and the assimilation of knowledge in the processes of creating earnings, on the man's capacity to take a step forward through innovation, on the efficiency of mobilizing the resources put at the disposal by the precious capacities of man. We must learn that the prosperity that we all dream primordially depends on an inestimable treasure, our capital resource, the man (Mursa, 2006)<sup>2</sup>. To summarize in a few words, the contribution of education to the improvement of the quality of human capital and of the growth can be seen from multiple angles. From the perspective of microeconomics, education increases the productivity per worker, and from macroeconomic point of view, the stock of existing human capital contributes to increasing GDP by crossing several levels of education (from the lower level - primary education, to higher education - university and post-university education) (Björklund and Kjellström, 2002; Castelló and Doménech, 2002). G. Jones and W.J. Schneider have calculated in their studies the average of IQ in 81 countries and have highlighted the correlation between results and economic growth. The conclusion reached is that at one unit increase of the level of intelligence of a nation will entail, on average, an economic growth of approximately 0.11% per year (Jones and Schneider, 2006; Hanushek and Kimko, 2000). Therefore, we can say that the intelligence is a measure of human capital. This statement is completed by an OECD study which shows that the participation in an additional year of education increases the average growth by up to 5% and to 2.5% on the long term. Moreover, a further year of schooling increases the level of individual wages by approximately 6.5%. The experience showed that the unemployment rate declines with higher education levels, reducing the social costs involved (OECD, 2012). In conclusion, we can affirm on the one hand that among the factors that influence investment in human capital are included the general state of a economy, the length and stability of income flow, the differences in income, direct and indirect costs, rent of ability, the recovery of investment in human capital, the marginal income of it etc., and on the other hand that the employment rate increases with the level of education attained.

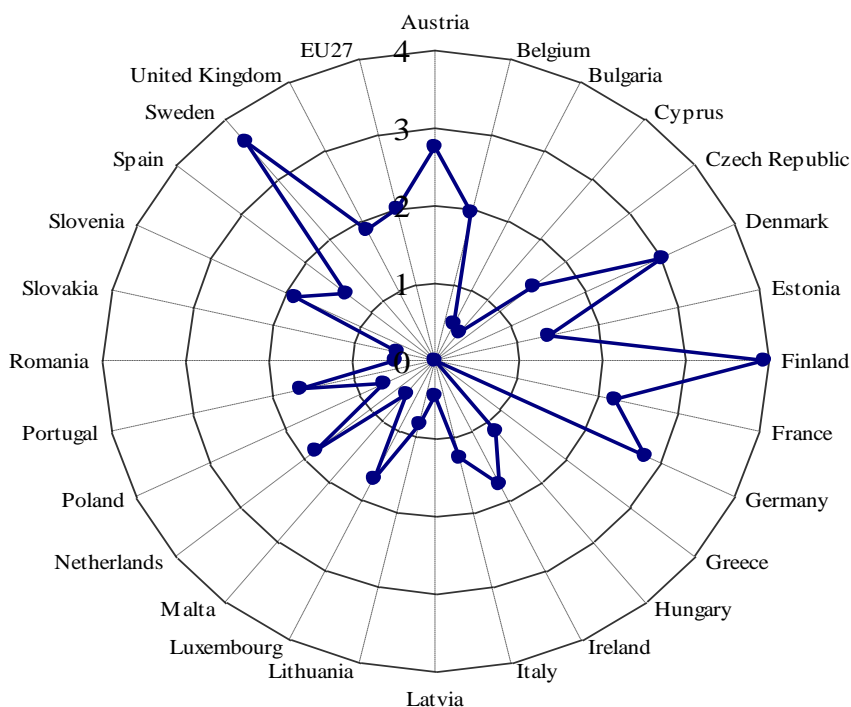
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abilities acquired during life, through own efforts or contacts with experts in different fields, assimilating information by interacting with them.

## 2. ANALYSIS OF R&D ACTIVITY IN THE EU COUNTRIES

The qualities of human resources in general and the educational factor in particular are determinant factors for the overall economic growth. The specialists in the field believe that there is a very close relationship between the technological progress and the investment in education, with implications for all areas of life: economic, social, political, cultural. In Figure 1, there are emphasized the differences that occur between the EU27 member states concerning the expenses in R&D sector.

**Figure 1. Expenditure with R&D in GDP (%), year 2011**

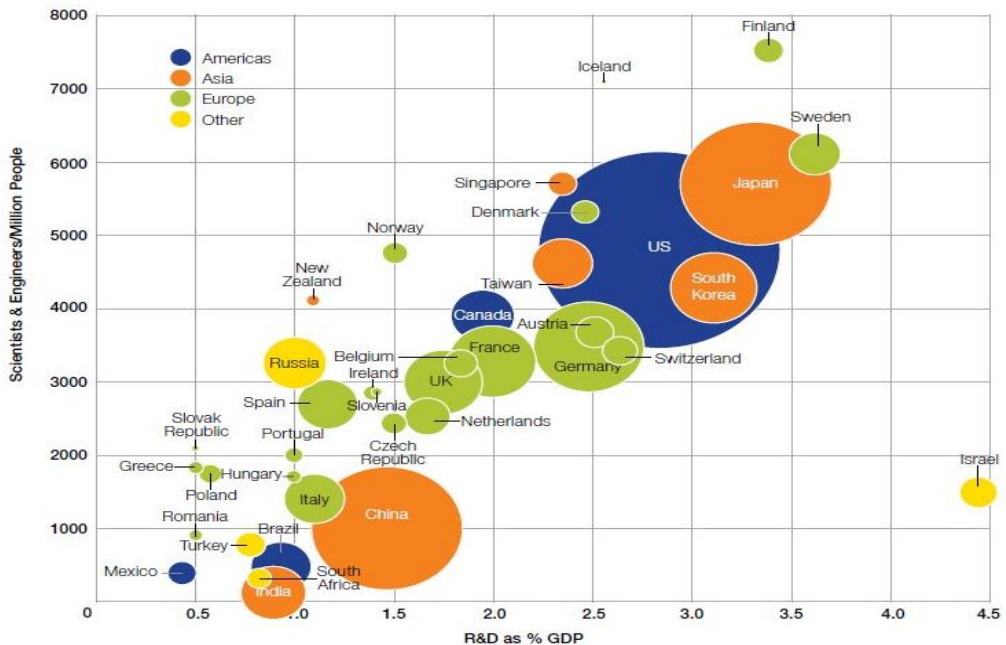


*Source:* authors' representations based on Eurostat data, 2011

Looking at Figure 1, can be seen that the highest percentages in the direction of R&D expenditure are found in Finland (3.96%), Sweden (3.62%), Denmark (3.02%), Germany (2.82%), Austria (2.75%), France (2.21%). In terms of this investment, these countries are over the EU27 average, which is of 2.01%. In such circumstances, it is understandable that the EU27 average is raised by the member states mentioned, some of them exceeding the target set by the Europe 2020 Strategy, according to which by 2020 the rate of investment in R&D should

be at least 3% of GDP. This objective is very ambitious when we think of some European countries, which currently spend very little on this sector, less than 1%. We specify here Latvia and Cyprus, both with 0.46%, Romania (0.47%), Slovakia (0.48%), Bulgaria (0.53%), Malta (0.54%), Poland (0.68 ) and Lithuania (0.84%). At global level, the picture of R&D expenses related to the number of scientists and engineers looks that in Figure 2.

**Figure 2. R&D expenses, at global level, 2011**

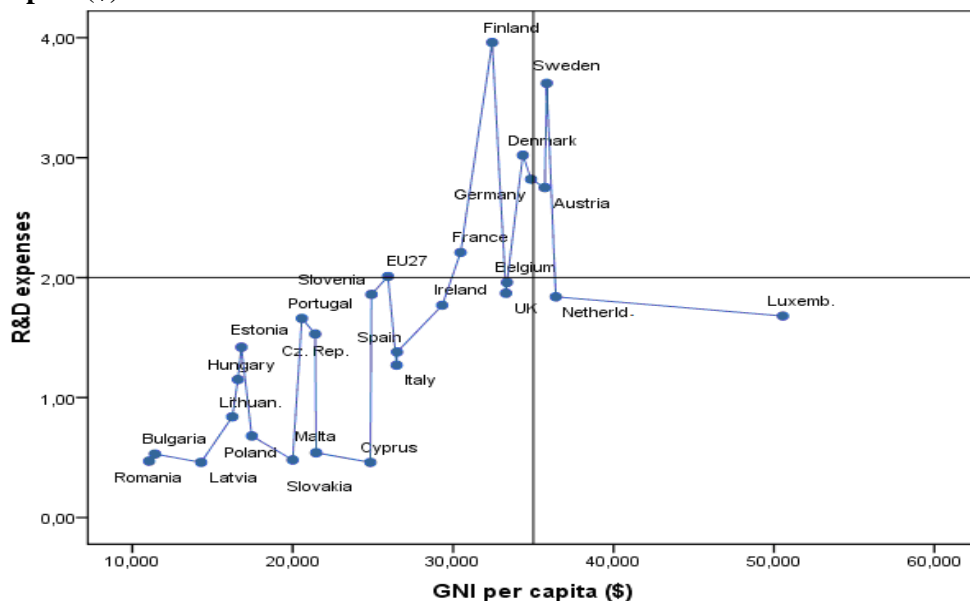


*Source:* after OECD, IMF, CIA data, 2011

Thus, it is gratifying that in the world rankings stands out the EU countries, namely Finland and Sweden. We can also see that as R&D expenditure, globally, Romania is comparable to Mexico. Usually, the more countries are rich, both public and private expenditure allocation to this sector is more consistent. But we must to point out the fact that countries that are currently on the top of the hierarchy at this chapter have understood since the '70s and '80s years that the investment in R&D is an essential need in order to advance towards an economic and technological progress. In Figure 3 we observe that the Nordic countries have realized the importance it holds research in economy, creating spillover effects.



**Figure 3. The relationship between R&D expenses (% of GDP) and GNI per capita (\$)**



Source: after Eurostat and HDR data, 2011

The leading position is occupied by Finland (3.96% of GDP), followed by Sweden (3.62%) and Denmark (3.02%). Romania, which has according to Human Development Report (HDR) the lowest level of GNI per capita (11.045\$), invested in 2011 only 0.47% of GDP in R&D direction. Somewhat on the same path with Romania is Bulgaria and Latvia.

To highlight the degree of interaction between the development level of a nation and the R&D expenditure, we present in Table 1 and Table 2, the results obtained in different regression models.

**Table 1. Model Summary**

Models	R	R Square	Adjusted R Square	Std. Error of the Estimate
Linear	.682	.465	.444	.725
Logarithmic	.710	.504	.484	.698
Quadratic	.745	.554	.517	.675
Cubic	.806	.649	.603	.612
Exponential	.715	.512	.492	.480

The independent variable is GNI per capita (\$).

Source: own calculations, based on Eurostat and HDR data, 2011

We note that across all models (linear, logarithmic, quadratic, cubic, exponential) there is a direct relationship between the dependent variable (R&D expenses) and the independent variable (GNI per capita), the value of R being over 0.500 in each case, which points out that the two variables influence each other in a proportion of over 50%.

**Table 2. Regression models**

Models	Description	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
<b>Linear</b>	GNI per capita (\$)	.071	.015	.682	4.663	.000
	(Constant)	-.213	.421		-.507	.617
<b>Logarithmic</b>	ln(GNI per capita (\$))	1.813	.360	.710	5.039	.000
	(Constant)	-	1.157		-	.001
<b>Quadratic</b>	GNI per capita (\$)	.213	.066	2.039	3.217	.004
	GNI per capita (\$) **				-	
	2	-.003	.001	-1.390	2.192	.038
	(Constant)	-			-	
<b>Cubic</b>		1.966	.890		2.208	.037
	GNI per capita (\$)	-.372	.242	-3.564	1.536	.138
	GNI per capita (\$) **					
	2	.019	.009	10.131	2.175	.040
	GNI per capita (\$) **				-	
<b>Exponential</b>	3	.000	.000	-6.175	2.493	.020
	(Constant)	2.838	2.089		1.359	.187
<b>Exponential</b>	GNI per capita (\$)	.052	.010	.715	5.119	.000
	(Constant)	.351	.098		3.588	.001

The dependent variable is ln(R&D expenses).

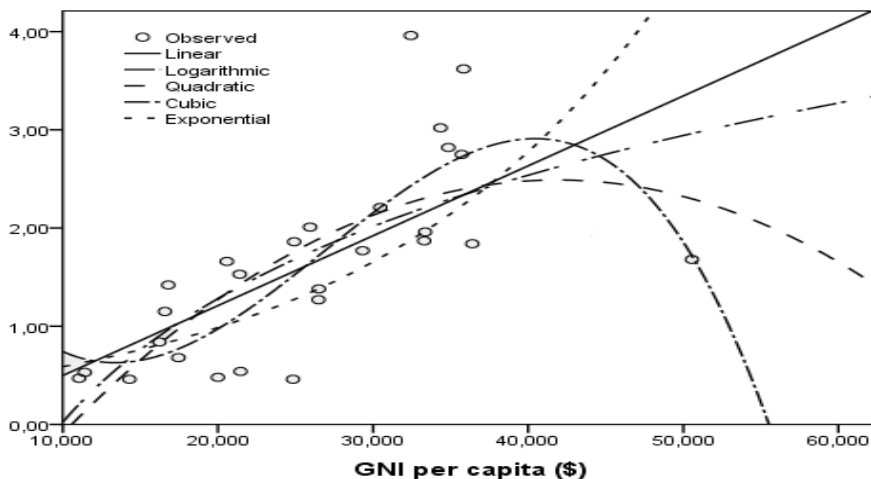
*Source:* own calculations, based on Eurostat and HDR data, 2011

Out of the five regression patterns we determined, the one which describes the best the relationship between the representative variables is the exponential one because it meets the following conditions at the same time:

a) the correlation ratio ( $R=0.715$ ) goes towards 1, which means that the more high the level of development of a country is, the tendency to allocate more financial resources in the direction of research is higher;

b) the significance level (*Sig.*) is smaller than 0.05 in the case of the exponential regression (0.000), which means that the regression parameters explains the connection between variables with a probability of over 95%. Thus, the regression equation appears like:  $Y=0.351+0.052*X$ , namely: GNI per capita= $0.052*R\&D$  expenses + 0.351, which denotes that for an increase by 0.3 \$ in the GNI per capita, the R&D expenses could increase by about 0.05%. This regression equation expresses only a trend which does not require a precise transposition in the real economy. In Figure 4 are represented the graphical representation of these models.

**Figure 4. The interdependence between R&D expenses and GNI per capita (\$)**



*Source:* own representation, based on Eurostat and HDR data, 2011

As a result of these findings, we can easily answer why Romania have not succeed to increase research spending even to be near the value of 3% of GDP, of which 1% to be obtained from the state budget and 2% from other sources. This value is an ambitious target but the Ministry of Education and Research made in 2007 some estimations concerning the sources of funding for

Romanian research in order to realize the Lisbon Strategy objective. The situation is presented in Table 3.

**Table 3. Sources of funding for Romanian research (% of GDP)**

Year	<i>State budget</i>	<i>Economic environment</i>	FP6/FP7 <sup>*)</sup>	Structural funds <sup>*)</sup>
2002	0.21	0.16	0.01	
2003	0.20	0.18	0.01	
2004	0.21	0.19	0.01	
2005	0.27	0.30	0.02	
2006	0.38	0.40	0.03	
2007	0.56	0.40	0.04	0.20
2008	0.75	0.60	0.10	0.50
2009	1.00	1.00	0.15	0.60
2010	1.00	1.20	0.20	0.60

*Source:* Ministry of Education and Research, 2007

These estimations of Ministry proved to be unrealistic, the investment in research being currently less than 1% of GDP. Concerning the distribution on the sources of funding, we consider that, in a large proportion, this goal is difficult to achieve even by 2020. It is supposed that by then, Romania will allocate up to 2% of GDP in R&D sector, so it will be unable to achieve this goal stipulated in the EU development strategy. Therefore, we conclude that when are taking decisions regarding the allocation of expenditure in the economy, the calculations are often focusing less on sectors that generate higher added value on long term. Without a coherent strategy based on the real needs of the economy, without a long-term vision and without the existence of some tools appropriate to the implementation of measures taken as a result of rational economic calculations, certainly the R&D spending will not increase significantly in Romania in the near future (Brouthers et al., 2001). That's why it is not hard to understand why at the education index chapter our country is positioned at the bottom of the European ranking (Table 4).

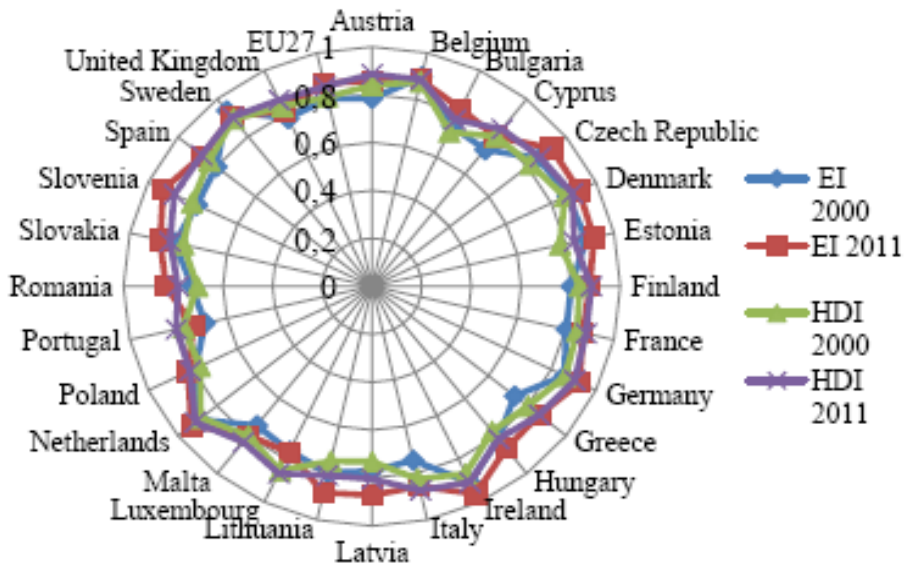
**Table 4. Education index in 2011 in the EU27 states**

Country	Education index	Country	Education index
Ireland	0.909	France	0.802
Slovenia	0.783	<b>EU27</b>	<b>0.803</b>
Netherlands	0.892	Hungary	0.816
Germany	0.928	Greece	0.734
Czech Republic	0.857	Austria	0.785
Denmark	0.872	Italy	0.745
Estonia	0.884	<b>Romania</b>	<b>0.725</b>
Sweden	0.937	Bulgaria	0.742
Lithuania	0.799	Poland	0.789
Belgium	0.896	United Kingdom	0.778
Finland	0.803	Cyprus	0.798
Slovakia	0.814	Malta	0.744
Spain	0.801	Luxembourg	0.764
Latvia	0.771	Portugal	0.691

*Source:* data collected from Human Development Report, 2011

If until 2010 year, the education index (EI), which is a component of Human Development Index (HDI), along life expectancy index (longevity) and standard of living (expressed in GNI), was calculated as a weighted arithmetic average between the degree of literacy of adults (with a share of two thirds) and the gross coverage rate in education at all levels (one thirds), in 2011 year it was calculated as a average between the Mean Years of Schooling (MYS), that a 25 years old person or older has spent in schools and Expected Years of Schooling (EYS), that a child that has over 5 years old will spend with his education during his whole life. This index varies on a scale between 0 and 1, the level of human development is even higher if it is closer to the value 1. Compared to year 2000, both education index and HDI have known a growth by 2011 year. For the education index the highest values occurring in Ireland (0.963) compared to 0.909 in 2000, Slovenia (0.933) versus 0.783; Netherlands (0.931) versus 0.892; Germany (0.928) versus 0.860; Denmark and Czech Republic (0.924), compared of 0.872 and respectively 0.857.

In Figure 5 is represented the dynamic of EI and of HDI in year 2011, compared to year 2000.

**Figure 5. EI versus HDI, 2000 and 2011 year**

*Source:* own representation, based on HDR data, 2011

We note that a significant step has been made by Slovenia, which seems to know how to define the national development program, focusing, as it should happen in any economy, on education. This fact gives it, according to Eurostat data, the 12<sup>th</sup> position concerning the GDP (86 points in PPS) of the 27 European Union nations. Bulgaria and Romania, countries with the lowest GDP in the EU, scored on the EI the following values: 0.822 in 2011 and 0.742 in 2000, respectively 0.831 in 2011 and 0.725 in 2000. Considering the HDI we can see the same trend as for the EI: when the EI register a growth or a decrease this involves a change in the same direction of HDI.

In Table 5 are presented the correlations between the indicators: GNI per capita, R&D expenses, HDI, MYS and EYS.

**Table 5. The correlations between indicators**

Coefficients				GNI per capita (\$)	R&D expenses	HDI
		MYS	EYS			
<b>MYS</b>	Pearson	1.000	.188	.036	.183	
	Kendall's tau_b	1.000	.132	.078	.165	.313*
	Spearman's rho	1.000	.183	.078	.237	.393*
<b>EYS</b>	Pearson	.188	1.000	.177	.484*	
	Kendall's tau_b	.132	1.000	.275*	.396**	.462**
	Spearman's rho	.183	1.000	.391*	.581**	.621**
<b>GNI per capita (\$)</b>	Pearson	.036	.177	1.000	.682**	
	Kendall's tau_b	.078	.275*	1.000	.576**	.723**
	Spearman's rho	.078	.391*	1.000	.782**	.881**
<b>R&amp;D expenses</b>	Pearson	.183	.484*	.682**	1.000	
	Kendall's tau_b	.165	.396**	.576**	1.000	.546**
	Spearman's rho	.237	.581**	.782**	1.000	.770**
<b>HDI</b>	Kendall's tau_b	.313*	.462**	.723**	.546**	1.000
	Spearman's rho	.393*	.621**	.881**	.770**	1.000

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Source: own calculations, based on Eurostat and HDR data, 2011

Can be observed that the strongest interdependencies are on the one hand between GNI per capita and HDI (Spearman index has a value of 0.881) and on the other hand between GNI per capita and R&D expenses (Spearman index has a value of 0.782), in consequence determining a strong connection between HDI and R&D expenses (0.770). This means that the more a country will invest in research and development, both HDI and GNI per capita will increase on long term, which will generate multiplier effects in economy, felt especially through the growing of the Expected Years of Schooling (EYS: Spearman index 0.621).

### 3. WHERE ROMANIA IS HEADING IN TERMS OF RESEARCH AND INNOVATION?

Referring to Romania, there are two conclusions stipulated in the Human Development Report: 1) the research system is very complicated and fragmented and 2) the funding of research is scanty. In addition, it occurs a poor integration of Romanian research in the European Research Area, reflected by low amounts that our country absorbs from the budget of the Framework Program (FP) of the European Union. In Table 6, it is exposed the Romanian participation with projects and the success rate obtained from the FP:

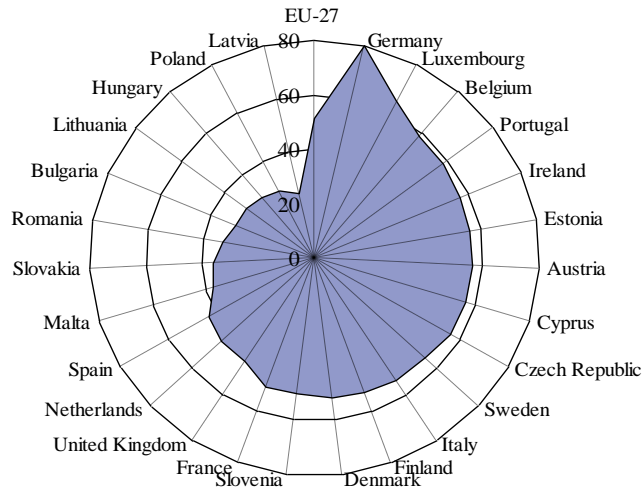
**Table 6. Romanian participation in FP and the success rate**

Country	No. of proposed projects	Projects retained for funding	Success rate (%)
<b>Romania</b>	<b>1.066</b>	<b>108</b>	10.27
Bulgaria	621	70	9.41
Czech Republic	1687	220	15.20
Hungary	1576	226	16.76
Poland	2774	363	13.96
Slovakia	741	97	15.42

*Source:* Ministry of Education and Research, 2011

We observe that the success rate of funding is relatively low (10.27%), compared with the number of projects submitted (1.066), after countries as Hungary, Slovakia, Czech Republic, Poland. Therefore, we can explain the low proportion of innovative enterprises in Romania (only 24.82%) compared to other countries at the European level (Figure 6).



**Figure 6. Innovative enterprises (% of all enterprises), 2011**

*Source:* own representation based on Eurostat data, 2011

At the EU level should be fully aware that the sustainable growth process is directly proportional with the innovation (Melnyk, 2012; Von Zedtwitz and Gassmann, 2002). For this reason, in the Union strategy concerning the innovation, supporting innovative clusters is defined as a major priority for promoting innovation (COM (2006) 502). In this respect, an important role is held by the initiative “INNOVA Europe”, launched in 2006, within the Competitiveness and Innovation Programme, which focuses primarily on the development of new or better tools, useful to clusters in their approach to support innovation. In year 2008, through the Small Business Act, the European Commission has regulated the first comprehensive policy framework for the SMEs of the European Union, promoting repeatedly the concept of innovative enterprises (COM(2008) 394). In Table 7 we represent a detailed picture of the innovative enterprises from the EU countries.

**Table 7. Innovative enterprises (% of all enterprises), 2011**

Innovations developed by an enterprise or by an innovative cluster					Innovations applied on market			
Countries	Total	With 10 to 49 employees	With 50 to 249 employees	With > 250 employees	Total	With 10 to 49 employees	With 50 to 249 employees	With > 250 employees
Belgium	42.24	42.73	39.25	47.5	47.46	47.13	45.48	59.25
Bulgaria	41.27	40.7	43.75	38.07	25.88	23.27	30.75	30.82
Czech Republic	38.99	40.09	35.36	41.17	39.14	34.04	46.96	54.13
Denmark	:	:	:	:	44.37	44.06	42.28	54.05
Germany	30.07	27.07	35.61	42.03	26.04	23.18	29.51	43.67
Estonia	40.52	37.87	44.27	55.98	25.84	24.21	27.99	36.11
Spain	50.7	50.58	49.4	57.37	21.45	18.01	28.12	43.61
France	50.77	50.84	49.07	55	43.24	39.92	46.32	60.04
Italy	44.94	44.04	48.7	47.92	47.65	45.45	55.52	61.43
Cyprus	50.93	53.46	47.33	22.73	26.75	23.96	33.59	40.91
Latvia	33.89	31.26	36.11	50.57	23.36	22.69	21.5	35.63
Lithuania	51.77	55.02	47.25	46.43	37.16	40.16	28.84	47.14
Luxemb.	51.66	48.03	53.19	69.67	40.62	35.32	47.6	55.79
Hungary	24.84	24.95	21.04	32.58	33.12	31.2	32.02	45.2
Malta	47.72	46.88	46.94	55	39.09	38.28	32.65	60
Netherl.	23.38	22.02	25.66	29.35	49.23	48.11	51.29	53.56
Austria	37.6	34.91	41.69	45.83	49.54	46.27	52.14	66.44
Poland	43.71	45.79	40.73	42.67	41.53	40.11	41.59	47.45
Portugal	52.02	52.35	50.74	52.24	35.63	33.09	41.66	53.73
<b>Romania</b>	<b>66.02</b>	<b>67.01</b>	<b>64.43</b>	<b>63.72</b>	<b>24.82</b>	<b>22.98</b>	<b>26.84</b>	<b>31.4</b>
Slovenia	37.2	36.17	38.83	38.73	51.27	51.25	48.08	59.54
Slovakia	34.23	34.55	31.33	39.68	35.66	34.23	33.39	48.02
Finland	39.18	40.44	35.06	40	37.33	35.46	35.85	57.74
Sweden	33.52	33.12	33.01	39.53	50.4	48.29	53.55	62.79

Source: after Eurostat, 2011

In terms of innovation, Romania is placed in a top position (66.02%) but there are weaknesses in the implementation of inventions in the economic environment. The market absorbs only 24.82% of innovations and this because there are not financial and legislative incentives in this direction. Therefore, the authorities must stimulate the clustering phenomenon not necessarily through direct interventions, but rather through indirect measures such as regulating the functioning of innovative networks, supporting the integration of enterprises into chains of clusters, strongly supporting of research and development. The innovations from Slovenia, Sweden, Austria, Netherlands, Belgium, Italy has the highest degree of implementation in the economic environment.

Having into consideration all aspects presented above, we can draw the SWOT matrix of the Romanian research-development-innovation system.

**Table 8. The SWOT analysis of Romanian R&D sector**

Strong points	Weak points
<p>The long tradition of R&amp;D sector;  The decentralization of the decision-making system and externalizing the management system of research;  Accumulating experience by creating the Research-Development National Plan, as a result of the participation to the FP6 and FP7 programs;  Human resources well trained</p>	<p>Deficiencies at the decision-making level (low transparency, weak monitoring of programs, excessive bureaucracy);  Weak correlation between the R&amp;D system and the industrial politics;  Low visibility of research;  Weak development of innovation infrastructure and funding;  Reduced mechanisms for disseminating the innovation results</p>
Opportunities	Threats
<p>The existence of R&amp;D networks;  Progressive integration of the R&amp;D system in the European system;  Existence of national and regional R&amp;D strategies;  Correlation of Romanian R&amp;D strategy with the European R&amp;D strategy</p>	<p>Reduced financing of R&amp;D by public funds;  Drastic reduction of private business in the R&amp;D field;  Reduced financial independence;  Economic and organizational difficulties of the main R&amp;D actors</p>

*Source:* after Roșca, I. Gh., 2006, p. 11

Therefore, the weaknesses are more numerous than the strong points, but we hope that through active involvement of both citizens and institutions, remain a hope: that to remedy the situation so that we can hold in country the human intelligence, which to contribute to the economic development. This needs to happen, the more so as the only engine of change is in our opinion the human capital. Starting from these considerations, in the next point of the present paper we will try to outline some steps that are required to be taken into account in order to ensure quality in education and research.

#### **4. SOME MEASURES TO ENSURE QUALITY IN THE RESEARCH SYSTEM**

An important concern of the governments from the entire world consists in adapting education according to the economy's needs, and we refer here to the needs of labor market. The correlation between education and labor market is also shared by the companies or institutions interested to employ graduates, being sensible to the educational system's capacity to offer to the potential employees sufficient abilities and competences through which to be able to answer at the challenges of global economy and competition. Considering Romania, currently appears the need for giving a major significance to scientific research and for ensuring quality in education through<sup>1</sup>:

- ✓ the increase of funds allocated to R&D sector and the linking of innovative outputs developed by the research institutes to the requirements of the labor market;
- ✓ the creation of a national system of best practices in research for assure a greater international visibility;
- ✓ the development of an evaluation system based on performance indicators;
- ✓ the increase of funds absorption (Structural Funds) from de EU in order to modernize the methods of management/governance, resources, etc.;
- ✓ the extension of innovative networks between universities and economic environment (clusters in research, business incubators and spin-off sites, the establishment of science parks and poles of excellence) by creating a legal non-bureaucratic and fiscal advantageous partnerships (Armstrong et al., 2005);
- ✓ an efficient and transparent use of public and private resources allocated in R&D sector;

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<sup>1</sup> For a detailed presentation of the Romanian education system, see The Ministry of Education and Research (2008), *Report on the Status of National Education*, <http://www.edu.ro/index.php/articles/10913>.

- ✓ the increase of the confidence of international scientific community in the ability of Romanian system to provide performance;
- ✓ the continuous improvement of the activities in all fundamental areas of competence.

## CONCLUSIONS

The governments play without doubt the central role in the direction of supporting the development of human capital. The public budgets are generally the main sources of funding, but private expenses are also rather important. The beneficiaries of human capital development are at the same time the individuals, the companies and the society. Investing in human capital supposes several types of major options: the decision regarding the level of optimal investment for the respective society and its members; the manner of distributing the costs between the public and private budgets; establishing the procedures of monitoring, measuring, evaluating and assuming the responsibilities for the short-term, medium and long-term investment results. The methods for stimulating the investments of private companies into human capital suppose, among other things, to be informed about the benefits of the investment, discounts in taxes, transparency on the labor market for emphasize the connection between education and knowledge, on the one hand, and salaries, on the other hand.

Currently, in Romania, in order to invest in human capital it is necessary to go through certain stages, not only conceptual, but also of mentality: first of all, it is necessary to understand the fact that, without a fast and thorough progress in the R&D sector, we will be able to have neither an economic growth nor an increase of the standard of living, no matter how many funds the European Union or any other international financial institution allot us; secondly, a real reformation of the entire educational system is necessary; thirdly, the change of mentality is required, the citizens of the country, businessmen, parents, young people need to understand that investing in education and research is the most important objective for the future. This great responsibility belongs to us, to all, individuals and governments at the same time. Otherwise, it will be difficult to catching-up the development gaps compared to other EU countries and to exit the peripheral economy status.

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