Scientific Research Management in Romania

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Abstract

The present paper presents the challenges of scientific research in the Romanian environment. The first part deals with current issues of the Romanian scientific research. After 25 years of searching, scientific research has not found the solution of working in correlation with major rules in EU countries. The change in the Romanian political system in 1990 found society unprepared for research work in the market economy. The second part focuses on how the research system should function. This requires a national management measure, which means the appearance of high professionalism and efficiency structures, made of specialized companies, that should operate on the principle of commissions. The last part presents the research strategy in regional, national and international framework. The conclusion is that the level of innovation and research culture in Romania is low, both in the business sector and in academia. In the field of interaction with the international environment, significant technological gaps in comparison with developed countries, stimulate technology import to the detriment of innovation.

Keywords: *research management, knowledge, performance, innovation, development.*

JEL classification: D83, I23, M10

Introduction

Science represents the human knowledge over nature, society and thought and consists of objective relationships, verified experimentally, being produced by scientific research. This, in turn, is the totality of facts and planned actions that aims to discover new knowledge. In addition, scientific research is a national, major initiative, supported by public funds (government), by companies and charitable sources. Scientific research stopped, especially after the Second World War, to be a quasi particular occupation, of passionate scholars. It has become one of the main and essential tools used by most countries to ensure sovereignty, independence and economic, social and cultural progress. Meeting the needs for improvement and increasing material production, of the economy in general and the development of the spiritual life of society, scientific research unfolds today

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according to clear and realistic programs, through the so-called research policy, where the most intelligent and competent minds of the nation are gathered.

In modern society it is more than obvious that scientific research consists in a strong development factor, and this is expected to happen in the future in the knowledge economy of the information society. “Knowledge has become a critical ingredient to gain competitive advantage in the new economic landscape”. (Nastase & Hotaran, 2011, p. 663) Research is, in today's world, the most important thing for improving living standards, health, culture and overall wealth of a nation. It is accepted the statement that, in the near future, the most important factors in dividing rich and poor countries, strong or weak will be less natural resources, the extent of territory or population size, but the increasing preparation, training and professionalism of that country citizens, their capacity of creation, discovery and development. The economic, social and cultural health of a country is not possible without a high level of education, well-structured and vigorous research. Neglect inevitably leads to stagnation and jeopardizes the long-term survival of the nation.

Basic research is a strategic activity for each country. Economic development is strongly influenced and related to fundamental research because it is a source of new knowledge, an important school for human resource training without which assimilation and use of advanced technologies is not possible, a source of prestige and acceptance standard in the international community.

It was found, in many European countries, the gap between the priorities of scientific institutions and the needs of society, scientific research goals and social demand being perceived as different universes. An important aid to equip the research system came from the European Union through the programs launched where higher education institutions submitted projects, so that they could establish and equip research laboratories with the latest generation of specialized equipment.

Once accepted the reality that social groups and individuals have many problems and scientific and technical questions, looking for resolution, the European Commission has begun to fund projects with predetermined thematic areas. It has been operated a complex interface system between research and industry, through projects dissemination of knowledge and technology transfer, centers for valuing research results. This phenomenon has also manifested in our country. To resolve the arising issues, it was released by the Ministry of Education, the National Research, Development and Innovation Plan for the period 2007-2013. This addressed three objectives of the national research, development and innovation system:

- creation of knowledge for the achievement of scientific and technological results, globally competitive in order to increase the international visibility of Romanian research and subsequently transfer the results in socio -economic practice;
- Romanian economic competitiveness through innovation, as impact on economic operators and transfer knowledge in the economic practice;
- increasing social quality, namely technical and scientific solutions that support social development and improve the human condition.

Programs of National Plan II focus on actions aimed at: Human Resources, Capacities, Ideas, Partnerships in priority areas, Innovation, Sustaining institutional performance. The structuring and defining way of programs reflect the type of policy in the research field adopted for that program. We therefore have resource-based development models that are viable on short-term, investment-based development models that can be applied with a considerable financial effort and involve selecting, acquiring and developing important technologies, and development models based on innovation, involving targeting investments to immaterial factors, i.e scientific research, information, active and adaptive management in conjunction with the development of production flows and flexible structures with high performance.

1. Current issues of the Romanian scientific research

In Romania, scientific research is for many years in a serious crisis, which every year becomes more profound because of clear disinterest of post 1990 governments. Scientific research is of vital importance for the future development of the country, and spending on science is not a subsidy but an investment. Romania has to decide what and how much research it can bear. Educational reform and the reform of scientific research are crucial, as they are best able to reduce distances and compress time.

After 25 years of searching, Romanian scientific research has not found the solution of working in correlation with major rules in EU countries. Before 1990, research in Romania was well organized and structured on economic areas, so that by its specialized institutes were solved mainly the issues raised by economy, research having, in this case, a mainly applied weight. Basic scientific and direct research was less achieved in these institutes and more in higher education institutions, here being actually concentrated the most important strengths of specialists in all economic and social areas.

The change in the Romanian political system in 1990 found society unprepared for research work in the market economy, through self-financing and operational activities at the requirements of the social and economic environment. Therefore, the management of research activities was not able to adapt to the system of self-financing, being used to budgetary financing, so that research institutions started to go bankrupt due to lack of funds. Large companies have skyrocketed, and the newly established ones lacked the financial strength to invest in research. In addition, many new established companies did not have an organized management, with adequate preparation, being actually a new economic system with other databases and operating principles and with a legislative gap that allowed anything. During these troubled times for the economy, national budget could not financially support the research activity; therefore these companies sold some of the assets in order to survive.

Applied research activity plummeted, firms being interested in importing equipment and technology rather than waiting for Romanian research results. In

these circumstances, scientific research has shifted maximum weight in higher education institutions, but applied research has not shown the chances of recovery. Scientific research developed in universities, being underfunded, could not produce spectacular results, remaining at the level of articles published in journals, at conferences, symposia and national and international congresses.

As far as research in the economic, social and humanistic field is concerned, it reached a certain level after 1990, including the establishment of new institutions in the system of Romanian Academy, centers for research in universities and some private institutes (marketing and surveys) being able to cover, even partially, the deficit of the communist period. Note that the main ways of acting in the national management of scientific research were rather to restrict than facilitate its development. The main point was to reduce public funding, while the sector was already affected by chronic underfunding. "Without underestimating the role of scientific research in the Romanian society, it is noted that Romania has a much lower potential for development in science than other EU countries, including recent entrants, or some which are still waiting for accession". (Marginean, 2007, p. 4) This low potential for development is due to extremely low status that is conferred to scientific research in Romania. This status is analyzed in terms of two indicators, which have a particular importance, especially for scientific performance, referring to human resources, on the one hand, and financial resources, on the other hand.

Table 1. National Institute of Statistics 2013

13.10 **Cheltuielile curente din activitatea de cercetare - dezvoltare, pe sectoare de performanță și tipuri de cercetare**
Current expenditure from research - development activity, by sector of performance and type of research

mii lei prețuri curente / *lei thou current prices*

	2007	2008	2009	2010	2011	2012	
Total	**1742744**	**2513439**	**2077224**	**2045132**	**2251480**	**2355492**	***Total***
Cercetare fundamentală	789518	1240289	874635	913033	943269	935201	*Basic research*
Cercetare aplicativă	800113	1072474	1047248	994602	944573	1021278	*Applicative research*
Dezvoltare experimentală	153113	200676	155341	137497	363638	399013	*Experimental development*
Sectorul mediului de afaceri	**737979**	**767604**	**830476**	**757366**	**824913**	**926145**	***Business sector***
Cercetare fundamentală	179117	202745	99713	123423	104786	52234	*Basic research*
Cercetare aplicativă	465149	445874	638670	546888	522875	612244	*Applicative research*
Dezvoltare experimentală	93713	118985	92093	87055	197252	261667	*Experimental development*
Sectorul guvernamental	**614560**	**1055808**	**745425**	**787571**	**924465**	**1000607**	***Government sector***
Cercetare fundamentală	380439	643337	446849	453391	521446	610223	*Basic research*
Cercetare aplicativă	212328	363172	256284	297500	285068	291760	*Applicative research*
Dezvoltare experimentală	21793	49299	42292	36680	117951	98624	*Experimental development*
Sectorul învățământ superior	**383305**	**684048**	**497338**	**490740**	**493722**	**418105**	***Tertiary education sector***
Cercetare fundamentală	229363	393905	325045	334701	310887	267711	*Basic research*
Cercetare aplicativă	121840	262540	151337	146871	134606	111775	*Applicative research*
Dezvoltare experimentală	32102	27603	20956	9168	48229	38619	*Experimental development*
Sectorul privat non-profit	**6900**	**5979**	**3985**	**9455**	**8380**	**10635**	***Private non-profit sector***
Cercetare fundamentală	599	302	3028	1518	6150	5033	*Basic research*
Cercetare aplicativă	796	888	957	3343	2024	5499	*Applicative research*
Dezvoltare experimentală	5505	4789	-	4594	206	103	*Experimental development*

Table 1 presents current expenditure from research-development activity, by sector of performance and type of research from 2007 until 2012.

Removing ideological control after 1989 allowed the free expression of Romanian researchers; unfortunately, financial constraints reduced substantially their potential for affirmation, as well as for institutes. It largely lacked the support of state in order to restructure and reshape technical institutes. However, this was essential for the subsequent transition to successful privatization. Privatization of these institutes, as well as enterprises, in the situation of advanced technical degradation and severe financial difficulties, is doomed to failure. Postwar Western European experience of privatizations focused on profitable business units and contributed to the development of the private sector, which was not the case, with some exceptions, in Romania. Moreover, contrary to natural evolution, in Romania, public services have been privatized prior to establishments of producing private goods units (commercial companies).

"Romanian research does not have a national management to finance the medium and long term priorities, so that different topics should be launched, whose results can meet the demands of social and economic environment. To achieve this objective, the state should invest in research, supporting it financially by well thought programs targeted at priority areas and of national interest and simultaneously pursue exploitation of research results". (Ivan, 2013, p. 10)

Totally inadequate situation, previously reported, regarding funding of scientific research in Romania, is due to ignorance of this field over the years, if not underestimating its role in modern society. The reasoning model, according to which scientific research does not deserve to be funded, that larger amounts for research will be allocated as well as for other social areas (education and healthcare), at the same time with the economic growth, cannot be accepted, precisely because research is a growth factor. “If research does not act optimally, that expected economic growth will not be obtained”. (Ivan, 2011, p. 24) Correlated with an efficient research management and development activity, adequate funding is able to induce, in a significant proportion, the expected growth.

Table 2 presents total expenditure from research-development activity, by sector of performance and financing source from 2007 until 2012.

Table 2. National Institute of Statistics 2013

13.12 Cheltuielile totale din activitatea de cercetare - dezvoltare, pe sectoare de performanță și surse de finanțare
Total expenditure from research - development activity, by sector of performance and financing source

mii lei prețuri curente / *lei thou current prices*

	2007	2008	2009	2010	2011	2012	
Total	**2177335**	**2980674**	**2356907**	**2413467**	**2786830**	**2872728**	***Total***
Fonduri din țară	**2078457**	**2862370**	**2160352**	**2144951**	**2450574**	**2457820**	***Domestic funds***
Întreprinderi	585046	693357	819086	778815	931757	888449	*Enterprises*
Fonduri publice	1309843	1556667	920358	922726	1179033	1092124	*Public funds*
Fonduri publice generale universitare	152034	532878	374065	390149	190125	342684	*University general public funds*
Unități din învățământul superior	30456	78709	45044	52337	14738	17277	*Tertiary education units*
Instituții fără scop lucrativ	1078	759	1799	924	1839	2772	*Non-lucrative purpose institutions*
Alte surse	...	...	...	...	133082	114514	*Other sources*
Fonduri din străinătate	**98878**	**118304**	**196555**	**268516**	**336256**	**414908**	***External funds***
Sectorul mediului de afaceri	**906506**	**892998**	**947047**	**924780**	**1004536**	**1119435**	***Business sector***
Fonduri din țară	**856873**	**843319**	**887119**	**859894**	**929973**	**963038**	***Domestic funds***
Întreprinderi	462209	491197	684833	578418	741448	719623	*Enterprises*
Fonduri publice	385716	349624	195669	278016	182243	219091	*Public funds*
Unități din învățământul superior	8187	2498	5808	3254	646	1799	*Tertiary education units*
Instituții fără scop lucrativ	761	-	809	206	133	30	*Non-lucrative purpose institutions*
Alte surse	...	...	...	...	5503	22495	*Other sources*
Fonduri din străinătate	**49633**	**49679**	**59928**	**64886**	**74563**	**156397**	***External funds***
Sectorul guvernamental	**739165**	**1220835**	**822725**	**887391**	**1134566**	**1175263**	***Government sector***
Fonduri din țară	**718547**	**1196741**	**750791**	**790419**	**1019993**	**1066952**	***Domestic funds***
Întreprinderi	88018	176425	111208	168624	152027	126225	*Enterprises*
Fonduri publice	625731	1018353	638066	620631	758822	853918	*Public funds*
Unități din învățământul superior	4788	1677	1210	1164	2865	9298	*Tertiary education units*
Instituții fără scop lucrativ	10	286	307	-	1111	41	*Non-lucrative purpose institutions*
Alte surse	...	...	...	...	105168	77470	*Other sources*
Fonduri din străinătate	**20618**	**24094**	**71934**	**96972**	**114573**	**108311**	***External funds***
Sectorul învățământ superior	**524742**	**859964**	**583055**	**591324**	**637208**	**566640**	***Tertiary education sector***
Fonduri din țară	**496130**	**816574**	**518548**	**486077**	**491168**	**417848**	***Domestic funds***
Întreprinderi	29162	21363	22299	25686	36206	42250	*Enterprises*
Fonduri publice	297146	187373	83530	21731	235104	15373	*Public funds*
Fonduri publice generale universitare	152034	532878	374065	390149	190125	342684	*University general public funds*
Unități din învățământul superior	17481	74487	38026	47873	11227	6177	*Tertiary education units*
Instituții fără scop lucrativ	307	473	628	638	588	831	*Non-lucrative purpose institutions*
Alte surse	...	...	...	...	17918	10533	*Other sources*
Fonduri din străinătate	**28612**	**43390**	**64507**	**105247**	**146040**	**148792**	***External funds***

Table 2. National Institute of Statistics 2013 (continued)

13.12 **Cheltuielile totale din activitatea de cercetare - dezvoltare, pe sectoare de performanță și surse de finanțare** - continuare
Total expenditure from research - development activity, by sector of performance and financing source - *continued*

mii lei prețuri curente / *lei thou current prices*

	2007	2008	2009	2010	2011	2012	
Sectorul privat non-profit	**6922**	**6877**	**4080**	**9972**	**10520**	**11390**	***Private non-profit sector***
Fonduri din țară	**6907**	**5736**	**3894**	**8561**	**9440**	**9982**	***Domestic funds***
Întreprinderi	5657	4372	746	6087	2076	351	*Enterprises*
Fonduri publice	1250	1317	3093	2348	2864	3742	*Public funds*
Unități din învățământul superior	-	47	-	46	-	3	*Tertiary education units*
Instituții fără scop lucrativ	-	-	55	80	7	1870	*Non-lucrative purpose institutions*
Alte surse	...	...	...	...	4493	4016	*Other sources*
Fonduri din străinătate	**15**	**1141**	**186**	**1411**	**1080**	**1408**	***External funds***
Ponderea cheltuielilor totale de cercetare-dezvoltare, în produsul intern brut (PIB) - % -	**0,52**	**0,58**	**0,47**	**0,46**	**0,50**	**0,49**[1)]	***Weight of total research-development expenditure, in GDP - % -***
din care:							*of which:*
Sectorul public [2)]	0,30	0,40	0,28	0,28	0,32	0,30	*Public sector [2)]*
Sectorul privat [3)]	0,22	0,17	0,19	0,18	0,18	0,19	*Private sector [3)]*
Ponderea cheltuielilor totale de cercetare-dezvoltare pe sectoare de performanță, în produsul intern brut (PIB) - % -	**0,52**	**0,58**	**0,47**	**0,46**	**0,50**	**0,49**[1)]	***Weight of total research-development expenditure by sectors of performance, in GDP - % -***
din care:							*of which:*
Sectorul mediului de afaceri - % în PIB	0,22	0,17	0,19	0,18	0,18	0,19	*Business sector - % in GDP*
Sectorul guvernamental - % în PIB	0,18	0,24	0,16	0,17	0,20	0,20	*Government sector - % in GDP*
Sectorul învățământ superior - % în PIB	0,12	0,17	0,12	0,11	0,11	0,10	*Tertiary education sector - % in GDP*

2. How the research system should function

Economic society is based, in its development, on research, this being the one that ensures the vertical development and thus its evolution. Basic research must create the bases of applied research, and applied research should create the support for economy and society development. “Operation of research system is generated by human society through its social needs, complexity of issues that must be solved according to its natural environment, culture, tradition and the implications arising from these issues”. (Ardelean, Dobrescu, Pisoschi, 2006, p. 83) Of course, the priority to be solved belongs to economic problems because the economy will respond to all the social problems that can be solved according to the level of development. Some of the social problems (health, education, social and national security) cannot be solved solely by economy and then comes the role of research, which will have to find optimal solutions.

Of course the links between society, economy and research require the existence of people and specialized structures to deal with these complex issues. This requires a national management measure, which means the appearance of high professionalism and efficiency structures, made of specialized companies, that should operate on the principle of commissions. Such a national management structure must be composed of commissioning companies, held on well defined areas of specialization, with a functioning legislative basis and consisting of creative people who want to achieve a number of businesses. These companies receive fixed or negotiable fees and may cover several fields depending on the size of the business they can handle. They must know the issues to be solved, the realization of these problems, to be able to quickly and efficiently get in touch with structures they monitor, to have the legal basis for those relationships and to be at a high level of reliability and responsibility.

In the context in which Romania has become a member country of the European Union, it is clear that they expect from us a range of solutions for the institutional, scientific, cultural construction of European civilization. Economic research has the main role to achieve economic convergence and the development of the country. This requires rapid development and deepening of economic research aspects such as: basic and applied economic research (of development), academic economic research (inside the institution), public and private financed economic research, permanent and ad hoc economic research. While basic research is the source of new knowledge and prestige for countries that cultivate it, “applied research seeks to implement, in social practice, theories and hypotheses proposed by fundamental research”. (Dodgson, Gann, Salter, 2008, p. 69) Sources of funding for research activity carried out by units and institutions of the national research system consist of: state budget funds - public funds; funds raised from legal entities; funds from international cooperation; other funds established by law.

Table 3 presents the number of projects and total research-development expenditure, according to NABS (Nomenclature for analysis and comparison of budgets and scientific programmes), by type of financing sources, for the research-development activity, in 2012.

Academic research carried out in research institutes is dominated by basic research, while university type research is concerned with applied research, with direct impact on teaching and a number of fundamental deepening of research.

Academic activity is a complex activity that involves both research (knowledge generation), education (dissemination of knowledge through educational activities) and innovative services to the community (transfer of knowledge to economy and society). Scientific research is a necessary component of higher education. However, it is the core activity of a university that confers prestige and ensures attracting students.

Table 3. National Institute of Statistics 2013

13.14 **Numărul proiectelor şi cheltuielile totale de cercetare - dezvoltare, conform NABS[1)], pe tipuri de surse de finanţare, pentru activitatea de cercetare - dezvoltare, în anul 2012**
Number of projects and total research - development expenditure, according to NABS[1)], by type of financing sources, for the research - development activity, in 2012

	Proiecte de cercetare-dezvoltare (număr) *Projects of research-development (number)*	Cheltuieli totale de cercetare-dezvoltare[2)] - total (mii lei preţuri curente) *Total expenditure for research-development[2)] - total (lei thou current prices)*	
TOTAL	**8394**	**1741903**	***Total***
din care, pe programe NABS[1)]:			*of which, by NABS[1)] programmes:*
Explorarea şi exploatarea pământului	78	16152	*Exploration and exploitation of the earth*
Mediu încojurător	358	62718	*Environment*
Exploatarea şi explorarea spaţiului	59	19420	*Exploration and exploitation of space*
Transport, telecomunicaţii şi alte infrastructuri	38	5361	*Transport, telecommunication and other infrastructures*
Energie	57	18598	*Energy*
Producţia şi tehnologia industrială	549	115860	*Industrial production and technology*
Sănătate	437	91119	*Health*
Agricultură	868	131032	*Agriculture*
Educaţie	582	131086	*Education*
Cultură, activităţi recreative, religie şi mass-media	151	15620	*Culture, recreation, religion and mass media*
Sisteme politice şi sociale, structuri şi procese	95	25487	*Political and social systems, structures and processes*
Promovarea generală a cunoaşterii: cercetare-dezvoltare finanţată din fondurile generale universitare (FGU), pentru:	2073	342684	*General advancement of knowledge: R&D financed from general university funds (GUF) for:*
ştiinţe naturale şi exacte	589	209028	*R&D related to Natural Sciences*
ştiinţe inginereşti şi tehnologice	1311	100077	*R&D related to Engineering Sciences*
ştiinţe medicale şi de sănătate	21	6566	*R&D related to Medical Sciences*
ştiinţe agricole	30	3580	*R&D related to Agricultural Sciences*
ştiinţe sociale şi economice	78	18687	*R&D related to Social Sciences*
ştiinţe umaniste	44	4746	*R&D related to Humanities*
Promovarea generală a cunoaşterii: cercetare-dezvoltare finanţată din alte surse decât fondurile generale universitare, pentru:	2898	740118	*General advancement of knowledge: R&D financed from other sources than GUF for:*
ştiinţe naturale şi exacte	761	344894	*R&D related to Natural Sciences*
ştiinţe inginereşti şi tehnologice	1494	249269	*R&D related to Engineering Sciences*
ştiinţe medicale şi de sănătate	76	10497	*R&D related to Medical Sciences*
ştiinţe agricole	21	17388	*R&D related to Agricultural Sciences*
ştiinţe sociale şi economice	293	59543	*R&D related to Social Sciences*
ştiinţe umaniste	253	58527	*R&D related to Humanities*

European Commission Androulla Vassiliou said "Investing in education, training and research is the best investment we can make for Europe's future. In the period 2014 – 2020, Erasmus+, the EU's new programme for education, training, youth and sport, will enable more than 4 million people to study, train, work or volunteer abroad. This experience enhances their skills, personal development and job prospects". (http://ec.europa.eu/)

The strategic objectives of scientific research are:

a) reconfiguration and optimization of research, development and innovation in a national competition framework, which allows for short-term performance indicators required to obtain institutional classification of university at education and research category;

b) positioning, on medium term, the university in universities' top of research and education in Romania and ranking university curricula among national hierarchy;

c) laying, at least, the essential foundations for passing, on the long term, to the possible redefinition of the mission undertaken by the university in the "advanced research and education" category and its positioning in the international charts.

In terms of public funding, it is justified only if it serves the production or distribution of a public good, while private financing is suitable for private goods. Also, major research projects should be funded through public-private consortia. In case the scientific research teams are made ad hoc, in view of a specific purpose, these teams stop their activity after accomplishing the project, and a new structure of the research team should occur when there is a need to achieve a new project.

"Unfortunately, during the whole process of education reform in our country it has not been taken into account and have not been achieved great things on the line of scientific research". (Anghelache, 2014, p. 281) It was acted for the restructuring in the national system of scientific research; for the adaptation of the national scientific research and technological development at the requirements in the EU integration process; equipment and computerization of laboratories; promoting collaborative projects and the creation of research centers; development of research and development activity at regional level and ensuring interface between research and industry, nationally and regionally.

Another key element was the effective transition at the research and development system as an operational structure of European type. This has meant that, in terms of research, measures applied aimed at:

- improving institutional management and, in this respect, consideration was given to increasing the efficiency of research and development by obtaining results for the beneficiaries of the economy and society;
- correlation of research topics with sector strategy in the medium and long term;
- promoting partnerships between researchers and beneficiaries to support the implementation of the results obtained by beneficiaries;
- research infrastructure' development;

- enhancing business innovation infrastructure development and establishment of institutions that develop themes financed by the European Union.

According to the program, the changes that have occurred in research aimed at: changing attitudes referring to research; restructuring science and technology system; coherent definition of priority areas of scientific research; attracting and maintaining, in the research- development activity, of youth with outstanding professional performance and establishing the status of the researcher and research-development activity. This structured program of research and development has led to the development of the capacity to generate scientific knowledge and technological development; increase the capacity of scientific and technological knowledge; development of opportunities to use scientific and technological knowledge and the possibility of research-development-innovation in firms.

3. Research strategy in regional, national and international framework

Research management is an integral part of university strategic management of higher education institutions that have assumed a research mission as part of the specific definition of institutional relevance. "Research management establishes concrete actions to follow in terms of research in order to reach institutional strategic objectives". (Serban, Cocean, Vizman, 2011, p. 10) Institutional strategy regarding research often reflects research priorities at regional, national or international level, depending on the relevance the university wants or can demonstrate in relation to them (regional relevance - research contracts with local or regional socio-economic environment; national relevance - research impacting on the development of a scientific field or a field relevant to the current development of Romania; international relevance - contributions to basic or applied research).

The option for a particular type of relevance for research is an extremely important strategic option for a higher education institution being usually followed by significant investment come both from extra-budgetary resources of the university and government funding based on direct or competitive allocation. A wrong choice, not validated by subsequent research results can mean an investment of resources recovered by image capital, rate of return of research activity and gain some positions in national and international competition, investment that could have been achieved more successful in other areas of institutional development.

Long-term vision on the role and place of the university in the academic -cultural and economic environment in which it evolves, is essential for making decisions about research strategy, "whose implementation requires long-term efforts to strengthen performance regardless the level of relevance the institution aims at". (Botez & Visan, 2012, p. 36) The first step in shaping a long-term vision on the role and place of scientific research in institutional development is to ensure a strong institutional commitment regarding a culture of research, performance and

competition, and respectively, reaching a consensus on the type of relevance followed by the institution as a whole or various institutional actors in research - development - innovation field, as a specific feature of their operation in a wider institutional context (research centers, networks, interdisciplinary research institutes, departments).

Depending on the type of internal organization, size, age and institutional traditions, getting a long-term institutional commitment may involve leadership and management structures and can act as a regulatory control mechanism imposed by the regulations and decisions or may be the result of institutional debates in the scientific research councils, of centers' networks - research institutes accepted at the institution level.

Research strategy is achieved by analyzing the development of potential internal and external factors. External factors are: political and economic factors (globalization, knowledge economy, research-development-innovation strategy); financial factors (policies and external financial mechanisms, national and international research programs); institutional position (socio-economic level of the region, requests from industry or government, the presence of other institutions, the existence of consulting or entrepreneurial activities). The internal factors are: vision and mission (requirements from internal and external funding bodies, change of status); research profile (research university status, developing relationships with industry); human resources and institutional structure (the existence of research competence, research opportunities, recruitment and retention of students for further studies at master level). Planning, implementation and assessment of such research strategies will take into account the weight of various internal and external factors according to the type of relevance assumed at institutional or department level.

Establishing research priorities aims at efficient use of scarce resources (research infrastructure, financial resources, human resources) for compatibility with the requirements of the respective institutional stakeholders of academic research and with research objectives set at national level. At international level, the perspective on research - development and innovation is completely new nowadays. "Linear process of innovation is replaced by a dynamic innovation process where peak research is the result of interdisciplinary collaborations, which also involves significant investment in technology and infrastructure". (Witzel, 2012, p. 101) Also, the dynamic of peak areas at international level registered an innovation rate that has grown rapidly during the last 10 years.

Assuming a type of institutional research, relevant internationally, involves strategic considerations:

- a financial effort at governmental and / or institutional level;
- institutional organization of research allowing an internal dynamics of research activity similar to the one existing in international research institutes, both in terms of access to information and in terms of access to technology and other resources needed for research;
- autonomy to decide on the allocation of resources;

- networking and organizational capacity of research activity;
- capacity to support an innovative, motivating research career.

These developments regarding the generation of innovation require some changes in planning and organization of research in higher education institutions in order to successfully adapt to the current dynamics in research – development and innovation field. Research management role will be to develop human resources from research to be capable of proactive and not just reactive transformation, depending on the significant environmental influences, so that strategic and scientific decisions in research field should enable a timely, flexible and successful organizational adaptation. Therefore, the main research management skills are not those of planning, coordination and implementation of strategic decisions, but those of prospecting and individual, organizational learning, namely change management. Skills of management, of strategies coordination but also change, in terms of fundamental and major changes in a supersaturated information environment, but where decisions cannot always be based on exhaustive analysis, are those that characterize the university management of today. More than a good strategist, planner and coordinator of operational management, a successful research manager will be the one that is a good change agent, a visionary, flexible leader.

Therefore, the setting of priorities, relevant internationally, "entails an optimal type of intra- institutional organization of research which often can be in contradiction with the internal organization of research activity derived from national or regional practices". (Enachescu, 2012, p. 124) Thus, at national level, research – development – innovation activity can be, for many national higher education systems, as is the case of Romania, organized in very specific areas, with bodies and authorities for evaluation and funding that, although encourage or promote the concept of interdisciplinarity in research, lack of mechanisms, structures and institutional skills developed to support it- from organizing doctoral and post- doctoral studies to the assessment and funding of research projects nationally. Here the preserved structure is the traditional one and internal organization is ultra specialized, on fields whose specialists do not cooperate among them or cooperate very little, cooperation being supported by internal, external or organizational mechanisms. "Scientific research is an important vector of the economic competitiveness of a country. The results of the scientific research will significantly depend on the way the activities of this field are managed and financed nationally, and the innovation, quality and way these are used, will significantly influence the international hierarchy of the strongest and most competitive economies, in a knowledge-based society". (Florescu & Cretu, 2013, p. 423)

Conclusions

Creating a functional and permanent structure of specialized forms in prospecting economic and social issues can make an effective research activity, providing, at the same time, the prospect of an activity without any flaws. By introducing the commissions system, it will be ensured that missing link and which, by its flexibility of action, makes effective research as time and topic.

Achieving fast and efficient connections to social and economic issues, which have to be solved in the short, medium and long term, involves creating a structured and specialized management system interposed between supply and demand and that should achieve quick, timely and effective connections between society and research.

Human resource development in the context of national priorities aims at achieving a level of expertise that should allow correlation of knowledge about technical developments globally and customization possibilities nationally. Research projects should ensure the performance conditions related to participants research career, ensuring their continued development, especially through domestic and international internships. The development of experimental facilities that should support applied research, will focus on those areas where collaboration between research entities and beneficiaries can be ensured. Investment in equipment, especially of high value, will have to take into account the potential for use and development of human resources as well as complementarity with existing facilities at European level.

The level of innovation and research culture in Romania is low, both in the business sector and in academia. Innovation in firms has been consistently supported by a functional technology transfer and venture capital can be considered absent. In the field of interaction with the international environment, significant technological gaps in comparison with developed countries stimulate technology import to the detriment of innovation. There is also the risk that transnational companies, which have acquired or developed production units in Romania, to relocate research-development and innovation activity. Lower cost of research in Romania can be a short-term advantage, but creates an additional risk linked to brain drain in the globalization framework.

Universities and public research institutes will have to develop their own structures capitalizing knowledge and will ensure its transfer in innovative products and services. The public investment in developing knowledge, motivated by strategic socioeconomic needs and research, is assessed according to its innovative capacity. Innovation is the one that assures the creation and maintenance of multiple interfaces between science, technology, society, financial, political and information environment in a knowledge-based economy.

National research strategy aims to increase the competitiveness of the Romanian economy through innovation, with direct impact on the technological capacity of companies that will benefit from the services offered by platforms and integrated research networks. Therefore, research policies aim both at stimulating activities carried out at the enterprise level and / or through partnerships established between research and development institutes, universities and enterprises and also increasing the capacity of diffusion and absorption in economy of scientific and technical knowledge, including research results and new technologies.

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