

Romanian scientific research - from slogans and secrecy to efficiency and performance

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Keywords: scientific research, research projects, intellectual property.

Abstract:

The scientific research is a strategic segment of any economy. The research using public funding is a necessity because it allows the risks supporting, and further a durable economic development. Detailing the researcher's contributions inside the project proposal is a condition for budget dimensioning and for the correct project management. The research reform by new trends towards the new economical realities requires the intellectual patrimony of research institutions setting up.

1. Introduction

It should be a deep error and a great untruth to believe or accredit the idea that Romania has no scientific research before 1989.

The effect that Romania had research is proven by a large set of political documents but also the way to structure the specialists' education and the fact that Romania was an active economic player on different markets with different goods.

It is proven by the book production, scientific papers production, scientific titles, and international cooperation of opening years of 70th and after the 1989.

However 1989 acts as the beginning of an important discontinuity. The actual moment urges doesn't allow the lucid analysis of the stage, trends and evolutions encouraged by the historical moment. Further, the political partisanship and the fear of real change acted as a strong motivation to avoid the state of the art analysis.

It is required more and more to do a just assessment of history or evolutions past already in history, it is required an analysis of conditions which have conditioned or encouraged the discontinuity, it is required more and more the rationale preparing of a real coupling between the Romanian and the international, especially European research, it is required the building of a current projection system inside of a larger projection of the Romanian society evolution.

These are also the objectives of this work. It has also the ambition to offer some conditions, a frame which can prove viable with innovations and solutions for problems which are still for too long time open or insufficiently approached.

The first section is dedicated to a survey sketch oriented mainly towards circumstances, reasons and qualitative outcomes. A second section approaches the new economical, social, political frame where the scientific research must exist, integrate, develop and become performing. A third section has as a main theme the research using public funding, and a fourth is the section where a new frame destined to reform and orient the

research towards efficiency by displacing the emphasis towards the intellectual property as created value.

The conclusions points out the immediate and future contribution brought by the suggested and implemented frame and initiatives.

2. A brief history and a survey sketch

The scientific research is symbolic component of any society and it has an evolution established decisively many times by the concrete conditions of the environment where it exists.

Theoretically, the research should be an avant-garde segment of society, apolitical, based on respect of expression freedom, on the respect of human capacity of creativity, oriented on society needs, with vision towards the future, with large economical autonomy and efficiency on respect of this autonomy.

The research interactions as sphere acts as in **Figure 1** with the education which ensures the manpower, with the economic environment which ensures the resources and outlet and with the social needs which should allow it the projection towards the future.

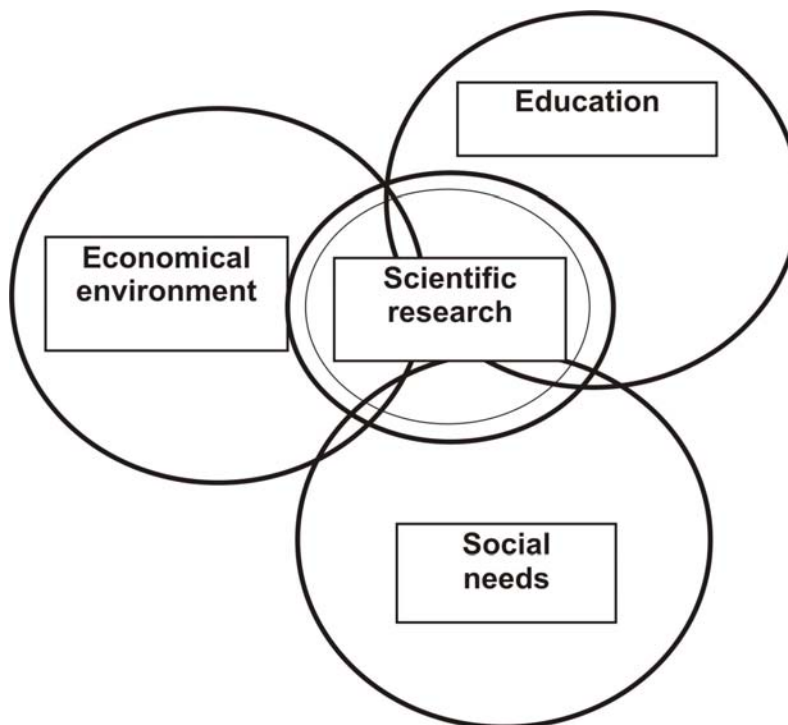


Figure 1 The scientific research interacts on different levels with the economical environment, with the education and with the social needs.

Interactions are at different levels, with different intensities and activity times.

A critical and objective view of historical period before 1989 allows couching some consistent diagnostic reference points:

- The Romanian research was one which ran in fault regime. This regime assumed economical relations developed under important political urges. That assumed privileged relations with some countries simultaneous with severe restrictions against other countries.

- The Romanian research responds to economical requirements of centralized development with components in all braches.
- The Romanian research acted under circumstances of limited economical changes and directed by other principles than of the free market. Here from appeared especially corrections with artificial stimulating or restricting character of the changes on destinations or addressee. Beneficial in ensemble this politics had as effect the consistent diminishing of concurrency and undesired changes of quality, especially for the internal market, in monopoly circumstances.

Which are the concrete features of the present Romanian research? It is obvious that these features are significantly different as the conditions of the historical year 1989:

- **Existence of aged and disqualified personnel** inside of research institutions (universities and research institutes).
- **Lack of healthy circulation of personnel inside of research institution.** There are no systematical and promising ways in order to rotate the young peoples in an education and work process in these institutions.
- **Lack of career project of the specialists.** The specialists have no perspective which, in the frame of a success career, involves the research in his evolution.
- **Keeping and promoting bureaucratic evidence systems.** These systems are especially oriented towards to personal responsibility covering than to real and efficient management of research resources.
- **Systematically displacement of emphasis from the researcher – employee to institution and employees groups.** One entirely overlooks that in research activity the first capital is the individual with her/his personal value and initiative, and afterwards the team. The both elements are in a natural relation: individual makes the team, the team builds the individual. It must no omitted that the team is consists of individuals and these must develop their personality, responsibility and results.
- **Lack of an efficient culture of communication in the research activity.** Old habits and customs, where the secrecy has still an important role.
- **Lack of correct attitude given the tax-payer.** In Romania the research was always funded of public funding. Neither the tax-payer, let it be person or legal person, nor did the funding beneficiary learn which are their rights and obligations. This state was and continues to be used unbalanced and the outcomes are never beneficial. Unfortunately, the loser is always the tax-payer, both today and on the longer time horizon.
- **Lack of qualified personnel for the research management.** The research is less and less a Bohemian activity available for eccentric creators. The research is more an economic activity and its outcomes must be firstly efficient. The management of research activity isn't a scientific problem but an economic performance challenge.
- **Lack of long life education in research activity.** In Romanian research system of activity the researchers, like the university professors are involved in no coherent long life education system.
- **Lack of feedback and feedback treatment coming from the community.** The Romanian scientific research can be regarded, mainly in the last years, as working

for its own purposes. The community, the tax-payer are involved in no equation where they should have some to ask or say regarding the research system.

A common feature of Romanian economy in the first years of capitalism can be added: a generalized and severe de-capitalization.

Unlike of the rest of the economy, in the research field the de-capitalization isn't only of financial resources, but also of the component of human creation values or intellectual property portfolio of research institution.

3. The public funded scientific research – a necessity

The public financial resources are available for institution and systems which cannot or must be commercially profitable. Generally are funded of these resources the public administration, the education, army and, more or less, the healthy.

A less obvious field where the public resources have a special role is the research generally speaking, and particularly of scientific research

The research represents a field with high economical risk. The investment necessary to keep the research area is a very important one and the outcomes are dependent of many factors which some economic agent, even it has major financial resources, cannot be covered without an important effort.

The natural question refers to the reasons the state and other public components should rally in a business when it knows that is a risky one.

The reasons are multiple and a review will allow a more stable and natural state of the art:

- **Scientific research is a part of the economic infrastructure of a state.** Economic development of any state is depending on the manner it can make available to investors infrastructure elements. Directly or by local authorities the state can offer or encourage the access to transport networks, utilities networks, communication systems. A special component of the infrastructure is the public research system.
- **Scientific research is a selection and training area for high qualified specialist.** Professional qualification isn't perfected by standard general school levels. Component of high qualified specialists assumes selections and experience accumulations in teams with high professional expertise difficult to be financed in commercial companies.
- **Scientific research represents a preparing segment of strategic trends.** The free-market laws assume an efficient dynamical running around some typical economical reference points of a given community. When we talk about large communities and important time periods than then simple law of demand - offer becomes instead of action's engine, a social danger and a reason to diminish the economical performance. This is the reason promote strategic politics by means of scientific research. These politics can be from specialists training to public healthy ensuring or new behavior regarding the environment protection.

As a consequence of the above mentioned the public funding of research is a necessity. As in other similar situations it is necessary to emphasize that the public funding doesn't assume the entire economical autonomy, and especially the area's autocephaly.

More definitely, the public funded research system must not solve itself the directivity and management tasks using internal mechanisms but using systems and mechanisms found under integrated control and supported by the other component of the society.

4. Reform of public funding research system

The Romanian system of public funded scientific research must be developed on market mechanisms without to omit the components dedicated to:

- Correct use of public budget.
- Differentiate increasing of the research in relation with real resources of the country.
- Differentiate increasing of the research in relation with the strategic trends of Romanian economy.
- Integrated control of Romanian society components on the trends, outcomes and distribution of budgetary resources.

In all the strategic control actions of research system the government must to give up and share its main with representatives of business environment, mainly the branch employers' organization and of civil society.

Further some proposals to accelerate and doing more efficient the reform of public funded research system are given.

4.2. Principles of building and assessment of project proposals

The project proposal is the minimal documentation [8] which is necessary in order to allow a research institution in participating to public auction to access funds for research.

The main points to be further approached are:

- Elaborating the project proposal objective's record.
- Building the project proposal budget chapter of "personnel of research team".
- Building the project proposal budget chapter of "technical endowment".
- Financial and scientific assessment of project proposal.

4.2.1. Elaborating the project proposal objective's record

The research project is in fact a business with typical risk [12]. Since the project needs a funding and this funding proceeds from public resources, one requires that the financier know detailed the destination of engaged resources.

Detailing the project in objectives it is possible to retrieve the entire amount of information which allows a normal, controllable, and estimable evolution.

The entire information amount will be centralized in a collecting record like in **Table 1**.

The columns will be filled as it follows:

- (1) – objective wording made in a single, as more explicitly possible. It is recommended that each objective be codified, like, by example, O1, O2...
- (2) – are specified the measurable outcomes associated to given objective.
- (3) – name and surname of each member of research team which is charged to solve some tasks assumed by the given objective. Are specified members with having all the necessary qualifications: scientific, technical, administrative, and auxiliary.
- (4) – main qualification or competence of team member which argued the reason she/he was included in the team.

(5) – the activity which will be performed by the team member to objective achievement will be detailed both for use of the proposal evaluator and for establishing of right relation inside the team.

(6) – the work amount to be performed by the hired team member trough her/his competence to accomplish the objective is estimated.

(7) – the measurable outcome to be finalized by each team member is identified.

Table 1 Collecting record of information grounding a specific objective.

Specific objective wording (1)		Measurable outcome (2)
Own personnel		
Employee's name		(3)
Qualification		(4)
Performed activity		(5)
Work amount (hours/month)		(6)
Measurable outcome		(7)
Employee's name		(3)
Qualification		(4)
Performed activity		(5)
Work amount (hours/month)		(6)
Measurable outcome		(7)
.....		
Consultants		
Consultant's name		(8)
Qualification		(9)
Performed activity		(10)
Measurable outcome		(11)
Consultant's name		(8)
Qualification		(9)
Performed activity		(10)
Measurable outcome		(11)
Own infrastructure		
Equipment	Technical features	
(12)		(13)
.....		
Infrastructure (additional)		
Equipment	Technical features	
(12)		(13)
Borrowed infrastructure		
Equipment	Technical features	
(12)		(13)
.....		

(8) – for consultants, when they exist, their name will be given.

(9) – like the hired personnel, the consultants have qualifications. The project initiator must specify these qualifications to allow to evaluator to find their necessity and relevance for the project proposal.

(10) – usually, it isn't necessary to specify for the consultants the work amount they will perform. The work to be performed by the consultants will be specified. This activity will be found on the work order for the consultants.

(11) – also for the consultants the measurable outcomes will be specified.

(12) – for each specific objective the typical equipment used to be completed will be given. Any equipment is specified with its technical name and always its technical features.

(13) – for specified equipments the relevant technical features to reach the objective are given.

4.2.2. Building of „personnel” chapter of project proposal budget

It is doubtless that a main component of a research project is the research team. That is the reason that the largest amount of the budget will be oriented to cover the personnel expenses.

The personnel expenses must be necessarily based on real competence and contribution of each team member.

Using an information record on the specific objective as in **Table 1** allows both a more correct vision for the project proposal initiator and a more detailed and refined justification of the building manner of budget chapters.

Analyzing the specific objective record results immediately the implied personnel categories, the hour number worked together with specific target and the foreseen outcomes of her/his work and the value of budgetary chapter is easy to be calculated.

That the situation isn't such is proven as in **Anti-example 1**.

4.2.3. Building of “Equipment” budgetary chapter of project proposal

A new vision regards the budgetary chapter of “equipment” in the project proposal.

First it is to specify that each institution with research activity has appeared in such time moment when its reason to exist was given. In this moment the institution capitalization and endowing was achieved.

So it is absolutely abnormal that a public funded research project to be used as a potential resource to endow the institution. One insists once again that the main destination of public funding is to maintain and develop the human potential of research institution.

Anti-example 1

In a research project proposal of Excellence Research Program (CeEx), in a team of a technical university they are five professors A, B, C, D, and respectively E. During the evaluation one establishes that, for statistics their individual record are impressive as number of published papers.

When the analysis is more carefully one establishes that in relation with the project theme, aim, and objectives of the overall papers number it can be assimilated that they are competence evidences only some papers presented of the professors A and E.

Note:

- Following the project proposal evaluation, this accomplished the selection conditions and so, these persons are consumers of public money without to have any real relation with the project and its objectives.
- The project proposal had no detailing record of objectives and the peer-review evaluators can only to imagine the relation existing between the B, C, D persons and the elaborated project proposal.

The “equipment” chapter can include at the most technical components as completion of a ground endowment necessary to allow the running project proposal.

A typical situation similar as in **Anti-example 2** is representative for the real and very serious aspect of endowing of institutions with research activity.

It isn't here the place to offer solutions for this matter, but the public budget is asked to act if it likes to have research activity. Two ways are immediately: launching auctions for

endowing projects using public funds and respectively to encourage the research institute to cooperate with the economical environment which can be interested in supporting this process.

Anti-example 2

In a research project proposal in the frame of Excellence Research Program (CeEx) having a goal in the medical area, have been foreseen as endowment (equipment) three computers, one laptop, and one printer. The project proposal accomplished the selection criteria and the financing was attributed.

Questions:

- Which is the specific role of these equipments in the proposed research project?
- How can be admitted a research institution in an excellence research program if it has no general endowment which assumes equipment like computers and printer?

4.2.4. Financial and scientific evaluation of research project proposal

Introducing the information collecting record as in **Table 1** allows a new vision to be taken in account by the project proposal evaluator. This vision must integrate well argued both information of scientific nature and financial-economic one [6].

It is necessary to specify that the project proposal evaluation activity becomes a professional matter and it must be performed by persons having a minimal qualification or knowledge in assessment activity.

4.3. Principles and innovations in research project achievement

4.3.1. Intellectual property – specific way to capitalize the research

Above we token about de-capitalization of research institute. This capitalization has two components. First component is the financial capital typical to any business. A second component is a typical one and it is given by the **intellectual property** ([1], [3], [4], [9], [10], [11]).

In **Figure 2** one finds that the patrimony of an institution oriented on research activity has in central position the intellectual property.

The intellectual property represents the materialized competence thesaurus of the research institution. Being a property, in juridical terms, this can be valorized by special transactions, mainly rights transfers. [7].

In this representation one finds the base role of public funding of research institutions: public funding has the role to develop and maintain the intellectual property patrimony of institution. Using this patrimony the institution can penetrate on the free market, towards the economic environment.

In **Table 1** are given the main stages of a general procedure to build and complete the intellectual property patrimony of a research institution.

Once this patrimony exists the research institution will become a credible potential candidate of any economic joint-venture with a company [5].

Here the transformation of declared competence in concrete objects of intellectual property finds and this policy is in entirely opposition with the secrecy associated traditionally to Romanian research.

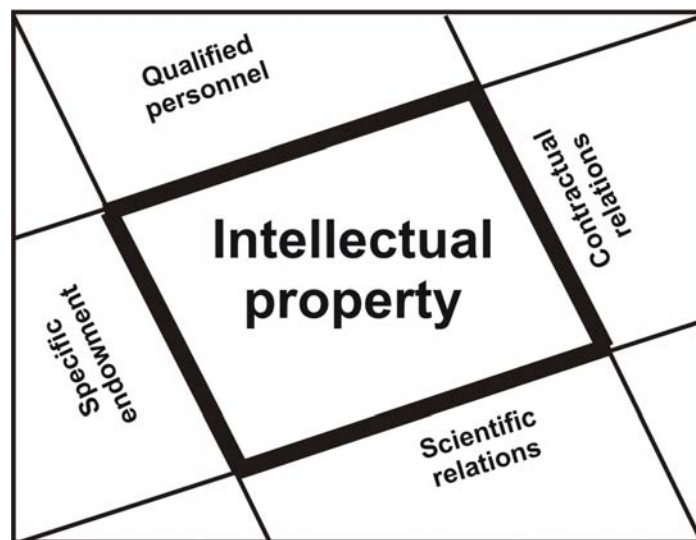


Figure 2 Patrimony of a research institution having in central position the intellectual property.

Table 2 General procedure of the patrimony of intellectual property constitution and completion in a research institution

Stage	Action and effect	
Stage 1.	Action:	Research project proposal building
	Effect:	One identifies and isolates the measurable objectives (outcomes) of the project.
Stage 2.	Action:	Research project achievement.
	Effect:	Each team member asks to objectives assumed by the approved proposal. The specific objectives achieving has as a measurable effect a study materialized in a research or technical report.
Stage 3.	Action:	Reporting the results of research project.
	Effect:	Elaborated technical or research reports are entered in series found in the National Library evidences.
Stage 4.	Action:	Valorization of public funding research project results.
	Effect:	In the contents of elaborated technical reports one identifies having in mind also the overall results : <ul style="list-style-type: none"> • The themes and contents of papers to be published. • The patentable solutions which will complete the intellectual property patrimony of the research institution.

4.3.2. "Open science" and technological transfer

The circuit described assuming a functional loop of public funding – competence accumulating and intellectual property patrimony increasing – connection to real economical environment – tax paying is a new growing strategy of research activity adequate to market economy requirements. In this loop the public funding plays the important role of main supporter of credibility of institution building.

When the intellectual property patrimony fails to come any discussion about technological transfer is a simple speculation, the expression of a desire without contents.

5. Concluding remarks

The work approaches a reform project of Romanian research. One considers the state of the art at 1989's moment and then a justification of public funding scientific research is introduced.

In this frame, some proposals in relation with the economical treatment of research project proposal for public auctions are given. The main of these refers to the necessity to

ground qualitatively and quantitatively the researchers' work.

The necessity of intellectual property as a typical way to capitalize the research institution is argued. To support that is given an original methodology to build and complete the intellectual property patrimony of a research institution.

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