Research and Development, New Contemporary Management Challenges

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Abstract:

Climate changes, energy security, population ageing and other contemporary world challenges necessitate an international cooperation in order to take advantage of the resources and to coordinate all the countries' investments for a long-lasting development. In this context, the European Commission launched the Framework Programme, which is the principal instrument of the European Union, used for research funding. The international scientific and technological cooperation has always been part of the European Union research policy, from the moment when the first Framework Programme was launched in 1983. An open access approach to the international cooperation was implemented once the sixth Framework Programme was launched between 2002 and 2006. This approach has been consolidated, in accordance with the seventh Framework Programme (2007-2013), by new instruments designed in accordance with each specific programme ("Cooperation,""Capacities," "People," "Ideas") in order to promote international cooperation. The purpose of this article is to provide an analysis of the application and of the access to these programmes.

Key Words: Framework Programme, research, cooperation.

JEL classification: O32

1. International Research and Development within the Framework Programmes

In January 2000, the EC identified the necessity to consolidate the international research inside and outside Europe. The European research needs to allign with the citizens' major preoccupations, by approaching common problems such as energy, environment and health, together with partners outside Europe. In 2007, the Green Charter confirmed this objective as an opening of ERA towards the world as well as the European engagement to deal with the global preoccupations, together with Europe's international partners, by means of multilateral cooperation. The Green Charter declared that in the global world of science and technology, the European countries need to develop a coherent approach for international cooperation in order to ensure themselves that science and technology efficiently contribute to the stability, security and prosperity in the world.

Approximately 75% (figure 1) of the world research has been done outside Europe. The global changing research and development environment is marked by the activities which are becoming more and more internationalized in each country. In most of the industrialized countries, the research and development process has performed abroad in foreign subsidiaries, approximately 16% of the total research and development expenses in many European states, and even in other parts of the world.

The community Framework Programmes extended their capacity to cooperate at an international level during 1998-2007. International scientific and technological cooperation has always been part of the European Union research policy from the

moment when the first Framework Programme was launched in 1983. It is about the Framework Programme FP5. In November 2002, in Brussels, the European Commission launched the sixth research Framework Programme in the European Union, for the period 2002-2006.

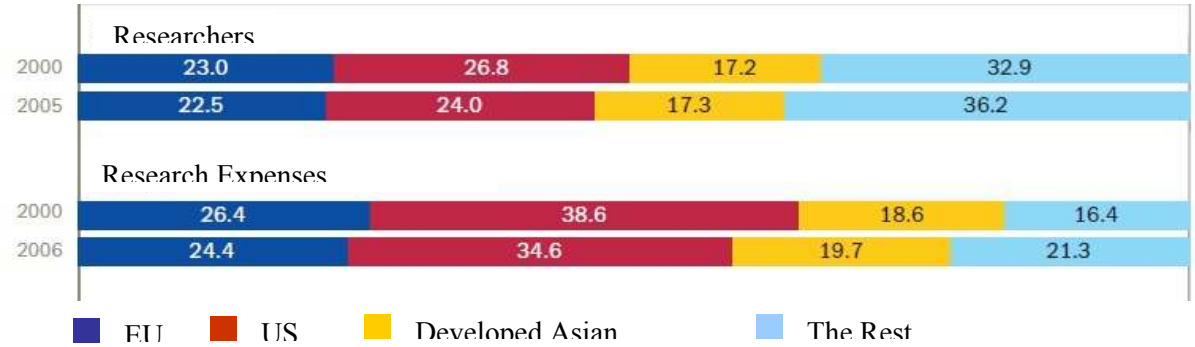

Fig. 1: The Percentage of Research and Development Researchers and Expenses
(source: Science, Technology and Competitiveness key figures report 2008/2009)

Eventually, the investments and funds for the exploitation of the research results are more and more fungible and the research production itself in the multinational companies is structured in global value chains.[1]

While the ex-Framework Programme focused almost exclusively on the Eastern and Central European developing countries, the sixth Framework Programme was opened for the third category countries in all thematic domains.

FP6 proposes to contribute to the creation of a true research space, a new vision on research in Europe, a new internal science and technology market. The economic growth depends more and more on research and many present and future challenges cannot be solved only by national actions.

The participation rate in FP5 and FP6 during the last years is presented in figure 2.

Most of the third category countries, which participated in the FP5 and FP6, came from the Russian Federation, the USA and China. The five countries which are considered emerging economies lead the ten participating countries in FP5 and FP6: the Russion Federation is in first place, followed by China, India, Brazil and the South Africa. The USA is the first in the industrialized countries top, followed by Canada and Australia. Eventually, Marocco leads the developing countries top, followed by Tunis, Ukraine and Argentine. The leading countries, which participate in both programmes, have increased their participation rate, in absolute terms, between FP5 and FP6. Nevertheless, in general, the participation rate of the third category countries is still very low, at 5,5%. The Russian Federation, the USA and China represent 32% of the third category countries participation rate.

In 2007, the seventh Framework Programme was launched (2007-2013) for funding the research in priority domains in order to meet the needs of the modern economy.

The provisory data regarding the participating countries in FP7, the cooperation and the capacity of the programmes in 2007 or the first call for proposals shows that the three leading countries, the Russian Federation, China and the USA, remain the same: the Russian Federation is in the first place with 697 participations, China in the second place with 548 participations and the United States, which occupies the third position with 492 participations. India is in the fouth place, with 422 participations (figure 3).

Regarding the financing proposals, those which involve the industrialized countries have, in general, a higher success rate than those which involve other countries: 22% in case of the USA and 29% for Australia, while the emerging economies vary between, for example, Brazil with 9%, China and the Russian Federation with 14% and 16%, respectively, and the South Africa with 24%.

[1] Remi Barre, Bastiaan de Laat, Jacques Theys, Management de la recherché, Ed. De Boeck, Paris, 2007, pg. 43.

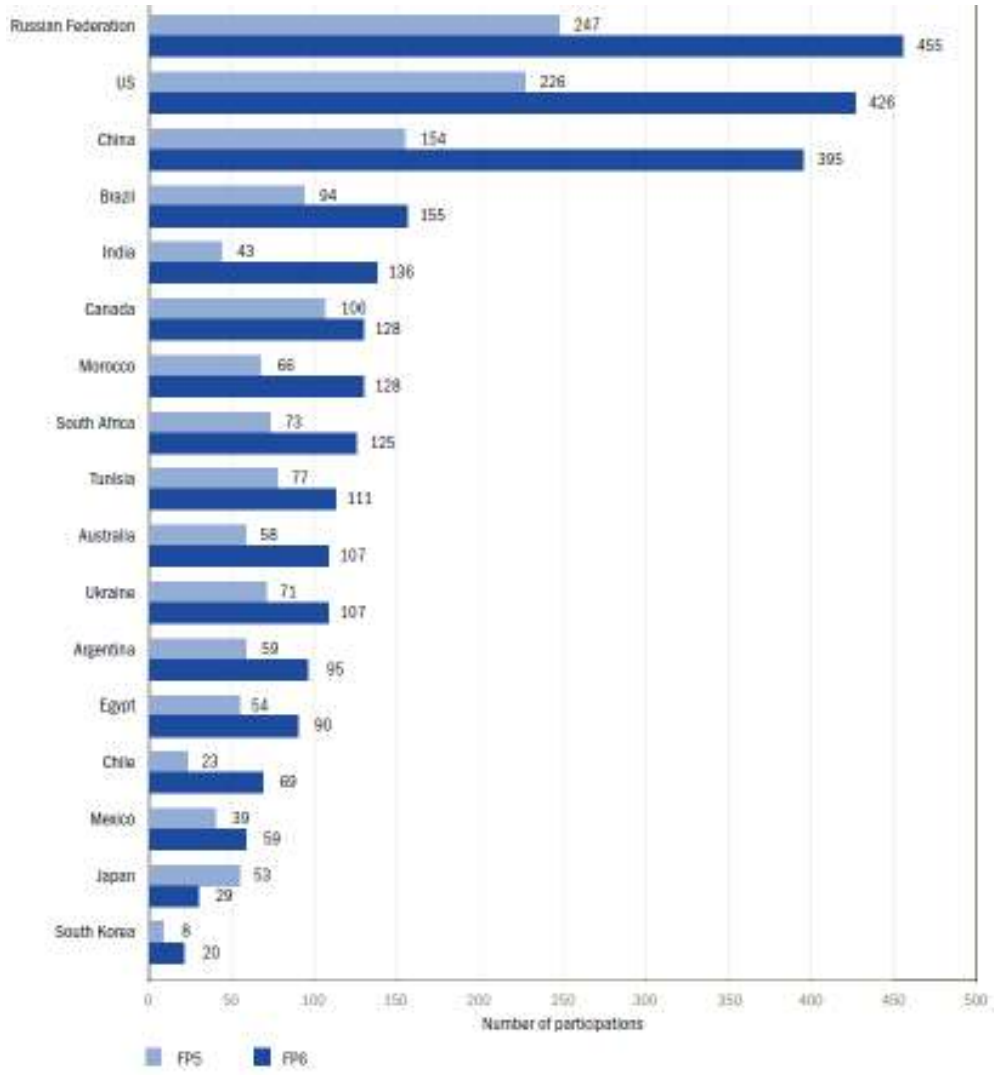

Fig. 2: The Participation of Different Countries in FP5 and FP6.
(source: Science, Technology and Competitiveness key figures report 2008/2009)

All the third category countries have seen the collaboration relationships with the EU member states multiplied by more times between FP5 and FP6. In general, Germany, France, Italy and the Great Britain are the largest research countries of Europe and they have more extended cooperation relationships than other member states of the EU. A typical example is the cooperation with the Russian Federation and China: Germany is the leader, followed by the United Kingdom, France and Italy. Nevertheless, other countries such as Holland, Sweden, Belgium, Finland, Greece, Hungary, Poland and Austria have strong connections with the Russian Federation and China. The cooperation relationships with Brasil are the best for the United Kingdom, followed by Germany, France and Spain. Smaller countries such as Holland, Belgium and Denmark also play an important role in establishing collaboration relationships at the global level (see table 1).

At the community level, the framework programmes have extended their application domain during the last 10 years. Although it innitially focused on the developing countries, Europe framework programme extended to the industrialized countries, as well. Most of the third category countries participants come from the Russian Federation, the USA and China.

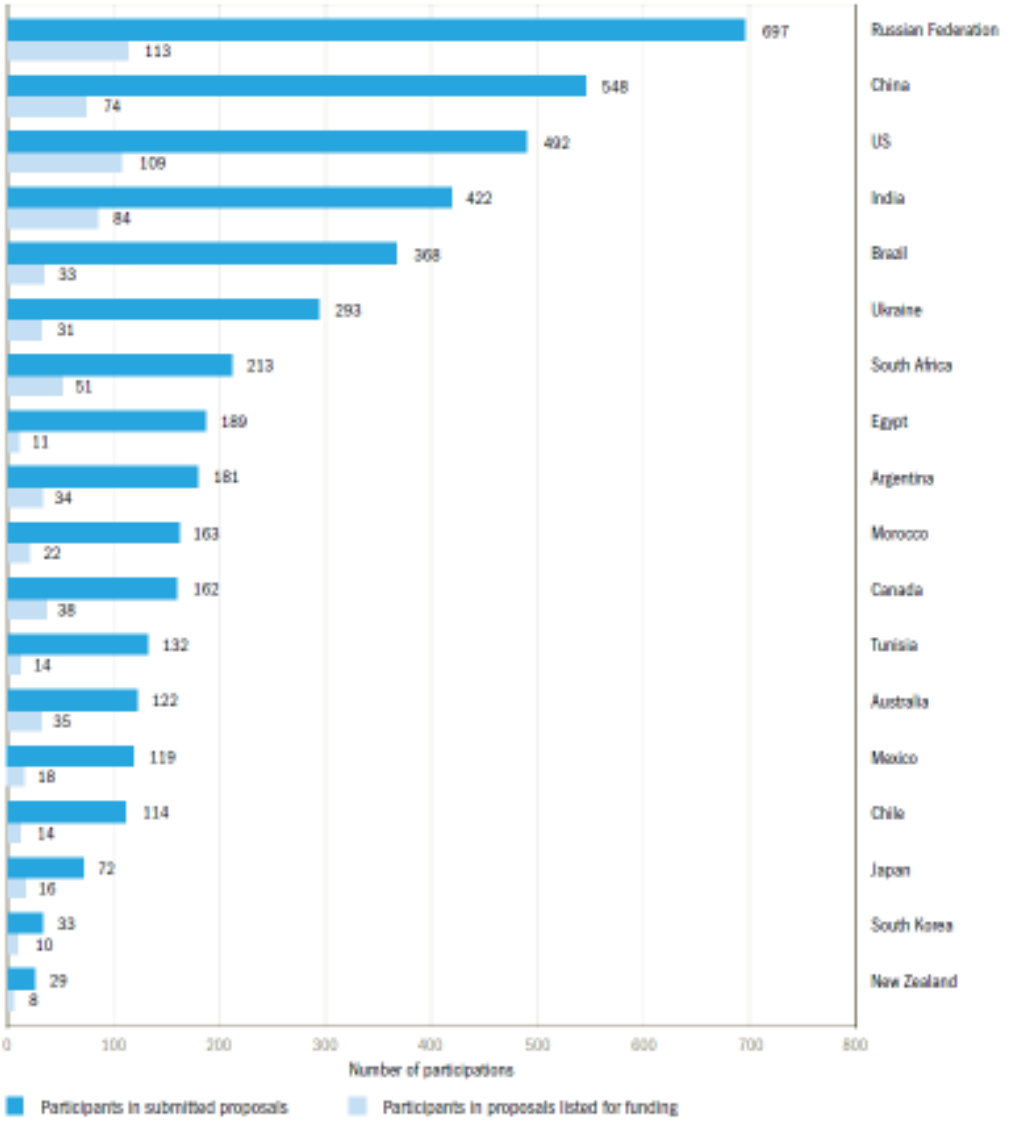

Fig. 3: Participations and Funding within FP7.

(source: Science, Technology and Competitiveness key figures report 2008/2009)

Although the largest research countries from Europe - Germany, France, Great Britain and Italy - have the most collaboration relationships with the third category countries researchers, more small member states used Europe framework programme in order to extend substantially the collaboration relationships.

2. The framework programme for funding the research and development in Romania

By implementing the National Strategy CDI, Romania ensures the allignment to the CDI policies orientations within the European space and participates actively in the consollidation process of the European Research Aria.

From the statistical data, presented by European Commision, which refer to the calls launched during 2007 2008, a number of 187,532 entities applied the Framework Programme FP of the EU during 2007 2013 (PC7) and PC7 Euratom, from which 23,160 participations were from Romania.

NUMBER OF LINKS PER COUNTRY

	Brazil		China		Russian Federation		India		South Africa		US	
	FP5	FP6	FP5	FP6	FP5	FP6	FP5	FP6	FP5	FP6	FP5	FP6
Belgium	31	60	35	139	8	189	4	56	13	82	1	95
Czech Republic	-	20	-	25	-	96	-	16	-	15	-	37
Denmark	3	43	3	121	8	129	2	51	11	54	1	76
Germany	52	179	80	420	75	772	9	138	24	194	2	421
Estonia	-	5	-	17	-	31	-	5	-	12	-	3
Ireland	3	24	3	36	10	58	-	8	5	18	-	46
Greece	20	39	13	103	20	158	2	38	9	39	-	108
France	61	140	59	298	27	577	5	97	16	174	1	315
Spain	55	131	24	200	7	292	4	70	18	96	-	154
Italy	69	113	63	291	25	423	10	106	35	134	-	236
Cyprus	-	2	-	7	-	16	-	2	-	4	-	5
Latvia	-	2	-	7	-	32	-	2	-	11	-	3
Lithuania	-	-	-	17	-	34	-	4	-	7	-	3
Luxembourg	-	5	9	10	-	10	-	-	-	-	-	2
Hungary	-	16	-	38	-	89	-	15	-	21	-	31
Malta	-	2	-	4	-	17	-	4	-	5	-	3
Netherlands	21	103	23	221	16	286	18	103	22	147	-	183
Austria	11	26	57	80	14	155	5	31	-	35	-	49
Poland	-	31	-	75	-	155	-	19	-	33	-	60
Portugal	23	27	26	48	1	85	2	12	12	34	-	32
Slovenia	-	9	-	20	-	41	-	2	-	12	-	20
Slovakia	-	5	-	16	-	40	-	6	-	13	-	9
Finland	8	18	15	76	34	113	9	21	4	25	-	50
Sweden	16	36	25	101	8	190	9	45	23	72	-	112
UK	-	186	-	405	-	636	-	183	-	261	-	371
> Total	373	1222	435	2775	253	4624	79	1034	192	1498	5	2424

Tab. 1: Collaborations within FP5 and FP6.
(source: Science, Technology and Competitiveness key figures report 2008/2009)

As a result of the evaluation, 21,497 entities have been selected for funding, from which a number of 230 from Romania. Those 230 entities from Romania participate in 181 contracts funded by the European Commission, 18 of them as collaborators.[2]

The total value of the European Commission for these contracts is of 640,419,434 euro, from which 30,041,281 euro for the Romanian entities (a percentage of 4,69 %). The distribution of the number of contracts in which Romania is involved) regarding the programmes and thematics, as well as the value of EC contribution looks as follows:

- COOPERATION: 114 contracts, EC contribution =21,409, 200 euro, namely 71.26%,
- HUMAN RESOURCES : 14 contracts, EC contribution =2, 236, 407 euro, namely 7.44%,
- CAPACITIES : 47 contracts, EC contribution =5, 829, 279 euro, namely 19.4%,

[2] Ion Plumb, et. al., Managementul cercetarii si inovarii, Ed. ASE, Bucuresti, 2007, pg. 157.

- EURATOM : 5 contracts, EC contribution =432, 050 euro, namely 1.44%.

We mention, in particular, Romania's participation in projects based on a solid transnational cooperation, supported by PC 6 and PC7, in the following way:

- Romania is directly involved in the coordination process, at a European level, of the national research programmes, through the participation of 16 projects of the type ERA NET. We can mention the projects in which ANCS is a direct partner, namely EUROPOLAR (polar research), HY CO (energy), NEURON ERA NET (health), SEE ERA.NET (bilateral cooperation).
- Romania is continuously supporting the development of the new forms of public-private research partnership, represented by the technological platforms as well as by the common technological innitiatives. During 2007-2008, Romania enrolled as a member in 4 from the six approved common technological innitiatives: ARTEMIS (integrated computer systems), ENIAC (nanotechnologies), IMI (innovative medicines) and CLEAN SKY (aeronautics).
- In the 34 European platforms, Romania participates with 31 national mirror platforms, from which we can mention in the Nano-domain - the platforms MANUfuture Romania, MINAM - Microand NanoManufacturing**,** NANOMED – (the Collaboration Platform in Nanomedicine).

Concerning the funds on domains, the priority ICT from COOPERATION detains the first place both as a percentage (23.66%) and as the sum paid to the participants from Romania (7,108,467 EUR). After ICT the domains with the highest success rate are transports (18.51% from the total and 5,561,365 EUR), nano-scientific and nano-material (9.5% from the total and 2.855.224 EUR) and the environment (4.36% from the total and 1,310,218 EUR).

If we look at the participation of the IMMs, 48 of the 230 participants come from these enterprises; this fact represents 20.87% of the total Romanian organizations, which benefit from the European funds from PC7, contributing to the research and technological transfer activities.

The contribution of the European Commission for IMMs represents 18,24% of the total 30, 041, 281 EUR, from which the Romanian scientific community has benefitted till now.

The share of the funds accessed by Romania on programmes and domains at PC7 (2007-2008) can be vizualized in figure 4.

4. Conclusions

Europe needs to strengthen the coherence of the research strategies, to increase the production potential, to use knowledge to become more competitive. The increase in the research and development investments must arrive at 3% from the GNP in the EU, in 2010.

More than 100 countries from the whole world are involved in the EU research programmes. These activities will continue within the cooperation programme of PC7. The international research will lead to the decrease of the differences, which exist between the countries of the world.

The international cooperation in the research and development domain will integrate the EU into the international community and will support the evolution of research and technology in those countries which are building their own knowledge capacity.

The Lisbon Strategy has the main purpose to make Europe become in 2010 the most competitive and dynamic economy, based on world knowledge, capable of sustained economic growth, with more workplaces and an extraordinary social cohesion.

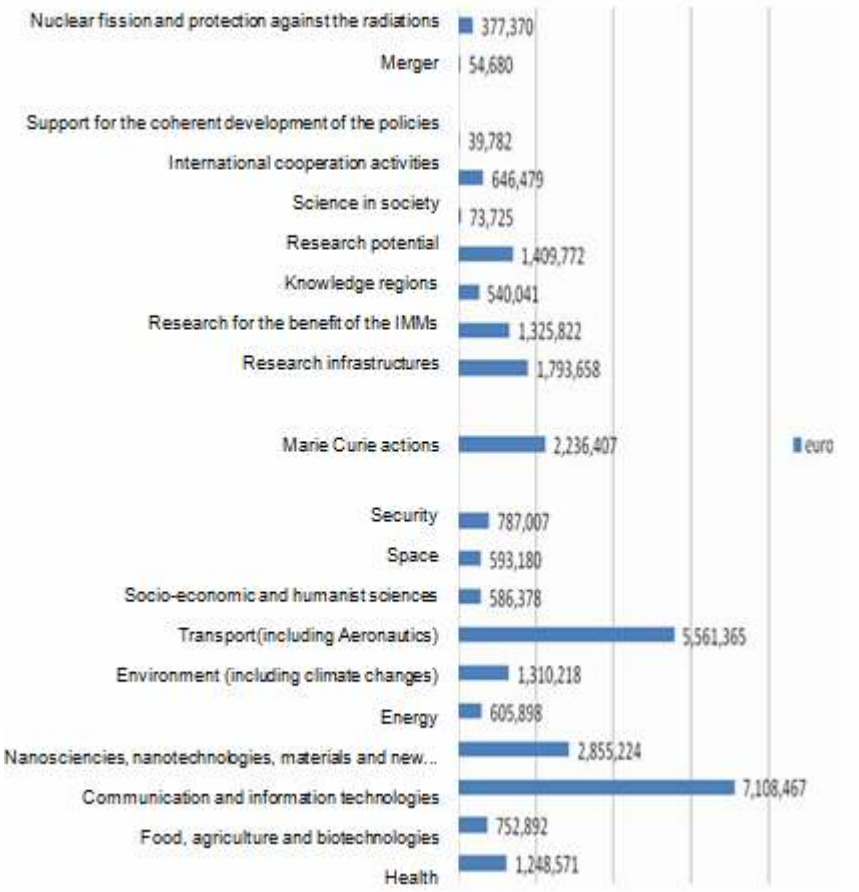

Fig. 4: The Programmes and Domains of the Funds accessed by Romania at PC7

(sursa: ANCS – Raport anual 2008)

Resources

[1] ANCS – Raport anual 2008.
[2] R. Barre, B. de Laat, J. Theys, Management de la recherché, Ed. De Boeck, Paris, 2007.
[3] I. Plumb, S. Visan, L.F. Botez, M.S. Florescu, A.Angelescu, Managementul cercetarii si inovarii, Ed. ASE, Bucuresti, 2007, pg. 157.
[4] Science, Technology and Competitiveness key figures report 2008/2009.