Romania's Research, Development and Innovation policy: Another view on European integration

Some lessons from the mid-term evaluation of Romania's National RDI Strategy and the National RDI Plan 2007-2013

(Politica de cercetare, dezvoltare şi inovare a României: o altă viziune asupra integrării europene)

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In 2007 the Romanian Government has launched its National RDI Strategy and Plan 2007-2013. As this policy was developed in 2005-2006, right on the eve of the country's accession to the EU in 2007, the Romanian Government decided to adopt both the thematic priorities as well as the respective programmes of FP7, which itself was ready to be launched for the same period. In doing so, the research (policy) system was confronted with a complex system of conceptual and institutional 'policy entities'. In 2011 a mid-term evaluation has been performed that has revealed numerous insights into the broader research policy making. This paper makes use of this extensive analysis and provides both evidence as well as recommendations for the next planning period.

1. The national RDI strategy and national RDI plan 2007-2013 in a nutshell

In 2005-2006 the Romanian Government launched an extensive foresight exercise involving more than 5,000 experts online and some 800 in seminars, focus groups, and conferences to develop a National RDI Policy for the period 2007-2013. The particular plan was to develop a National RDI Strategy as a general framework and a National RDI Plan addressing the more concrete policy, programmes, and measures including the specification of budgets, rules of implementation and concrete targets. This policy was launched in 2006 right on the eve of the country's accession to the EU in 2007.

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In doing so, the research (policy) system was confronted with a complex system of conceptual and institutional 'policy entities': visions, strategies, priorities, measures, result indicators, councils, programmes, instruments, foresight, calls, criteria, indicators, evaluation, monitoring.

The National RDI Strategy 2007-2013 and the National RDI Plan 2007-2013[2] together are the core of Romanian RDI policy over the last five to seven years. They serve both as a conceptual background as well as a community-wide underpinning of most follow-up activities. Most of the conceptual thinking, the selection of approaches, and the ways in which policies, programmes, and institutions are organised are laid down in this document.

The National RDI Strategy 2007-2013 commits to a number of rather fundamental ways of planning and implementing RDI policies in Romania. Table 1 provides an overview over the main commitments.

Table 1. Fundamental commitments in the National RDI Strategy 2007-2013.

Major commitment	Quotation from National RDI Strategy 2007-2013
Justification of RDI by economic and social progress	"The National Strategy is based on the vision of the Romanian society concerning the role of science, technology and innovation for the development of the knowledge society in Romania, targeting the economic and social progress."
National Strategy provides the ground for the organisation of RDI and thematic priorities	"The National Strategy provides the ground for RDI system's organisation and defines the main areas and the way in which the public investment will be concentrated in research & development to support innovation in the coming years."
National Strategy provides the basis for the organisation of policy-making and policy implementation	"This National Strategy establishes the basic principles in the field of RDI: ex-ante evaluation of policies and actions; international evaluation of policies, programmes and projects implementation; international evaluation of public institutions (universities and research institutes); correlation between performance and institutional funding; career promotion based on internationally-recognised professional performance; support for researchers mobility; involvement of young doctoral students, post-doctoral researchers, and experienced, performant researchers of any nationality; increase of scientific cooperation connections with the Romanian scientific diaspora; development of international cooperation and support for the participation to programs and projects; support for innovation, also by increasing the public demand for innovation; increasing the share of state aid dedicated to innovation support; constant dialogue with society."
National Strategy provides guidance for a (European) catch-up process	"The Strategy has the main goal to eliminate the disparities as compared to the European countries and to prepare the Romanian RDI system for identifying and consolidating, through international openness, partnership and competition, those unique areas where Romania can excel."

Source: National RDI Strategy 2007-2013, pp. 5f

These are bold statements as they put research policy into a broad political framework, particularly in the context of contributing to economic competitiveness and social progress. In doing so, it – implicitly – relates research policy to sectoral policies. Further, the National RDI Strategy 2007-2013 acts as a conceptual basis for National RDI Plan 2007-2013. Finally, it serves as a navigator for putting Romania in an international, particularly European perspective.

The structure of the National RDI Plan 2007–2013 includes six programmes, each aiming at specific objectives and implicitly at specific target groups. Table 2 provides an overview of programmes and planned budgets. According to Government Decision no. 475/2007, the total volume of funds planned to be provided amounts to 15 billion LEI and is allocated as follows:

Table 2. Structure and allocation table of the National RDI Plan 2007-2013.

Programme 1. Human resources Objective: Increase of the number of researchers and of their professional performances, as well as increase of the attractiveness of research careers. Budget: 1,350 million LEI (9% of total budget)
Programme 2. Capacities Objective: Development of the research capacities and opening of the RDI system to the international scientific environment and to the national social-economic environment. The programme aims at the improvement of the working environment in order to give researchers the possibility to work with high technology equipment, to benefit from a proper management and to maintain a permanent relationship with the socio-economic needs. Budget: 2,025 million LEI (14% of total budget)
Programme 3. Ideas Objective: To get cutting–edge scientific and technologic results, comparable with the ones at the European level, reflected through the increase of the visibility and the international acknowledgement of the Romanian research sector. The programme supports the fundamental research, considering its importance in the development of knowledge and the fact that it provides a solid basis for applicative research and technological development. The accent is put on excellence and international visibility, through complex researches in frontier fields and interdisciplinarity and the participation in international networks of excellence research. Budget: 2,700 million LEI (18% of total budget)
Programme 4. Partnerships in the priority RDI fields Objective: The increase of the competitiveness of the R&D activities through the stimulation of partnerships in the priority RDI fields materialised through innovative technologies, products and services. The program aims at creating conditions for a better collaboration among the different RDI entities, firms and/or public administration units in order to come up with innovative solutions to the complex problems raised by the development of science and of the cutting-edge technologies in Romania and also at fulfilling the strategic objectives of economic and social development. The research is assessed in relation to its innovative capacity. Budget: 5,400 million LEI (36% of total budget), out of which, by percentage: 1. Information and communications technology 10% 2. Energy 10% 3. Environment 14% 4. Health 14% 5. Agriculture, food safety and security 12% 6. Biotechnology, biology and genetics 7% 7. Innovative materials, processes and products 15% 8. Space and security 8% 9. Socio-economic and humanistic research 10%
Programme 5. Innovation Objective: Increase of the capacity of innovation, technological development and assimilation in production of the research results at the level of the economic agents, in order to improve the competitiveness of the national economy and increase the quality of life. The programme supports technological development and innovation projects initiated and led by the economic agents, as well as projects for the development of the technology transfer and innovation infrastructure. Budget: 2,025 million LEI (14% of total budget)
Programme 6. The institutional performance Objective: The support of the institutional performance by ensuring the continuity and the stability of the activities of the RDI entities. The programme allows the research institutions considered of national interest to implement their own development strategies in accordance with the National RDI Strategy. The programme sets out mechanisms of institutional financing by competition, as well as the international assessment of the research performances of the participating institutions, at intervals of 3-5 years. Budget: 1,500 million LEI (10% of total budget)

Source: National RDI Plan 2007-2013, pp. 9 ff. Government Decision no. 475/ 2007

The National RDI plan 2007-2013 has been launched in a highly determined manner in the first two years of its seven-years period, as all but the Institutional performance programme have been launched (cf. Table 3). The launch of the Plan itself comprises about 20 different funding schemes.

Table 3. The implementation of the National RDI Plan 2007-2013.

Programme	2007	2008	2009	2010
Human resources (9%)	RP TD x 2 MD MC R&D Awards	RP RC TD MD R&D Awards Stefan Odobleja Scholarship	TE RP MC R&D Awards	 R&D Awards
Capacities (14%)	Module 1 Module 2	Module 1 Module 2 Module 3 Module 4		Module 2
Ideas (18%)	PCE	PCE PCCE WE		
Partnerships (36%)	x	x		
Innovation (14%)	Development of products/systems	Development of products/systems EUREKA + EUROSTARS		
Institutional performance (10%)				

Source: National Authority for Scientific Research
RP: Research projects to support researchers return to the country
RC: Complex research projects to support re-integration of researchers to the country
TE: Research projects for setting up independent young researcher teams
TD: Research projects for young PhDs
MD: Projects to support mobility of PhD students
MC: Projects to support mobility of researchers
PCE: Exploratory research projects
PCCE: Complex exploratory research projects
WE: Exploratory workshops
Module 1: Small projects for investment in R&D research infrastructure
Module 2: Support projects for R&D and innovation activities
Module 3: Projects to finance the participation of Romanian research organisations in international projects
Module 4: Support projects to sustain Romanian representation in international scientific and technical bodies

As can be seen from Table 3, the National RDI Plan 2007-2013 has been implemented over the first four years with changing priorities. While Romanian researchers enjoyed generous funding opportunities during the first two years, the third and fourth year are characterised by a sharp decline, not to say a termination; only a few smaller funding schemes, supporting the mobility of researchers, remained available.

In this regard, Romania is one out of four EU member states that experienced a significant decline of public R&D expenditures in the course of the overall financial crisis: Latvia reduced its nominal Government budget appropriations or outlays for R&D (GBAORD) in 2009 compared to 2008 by 43.2%, Lithuania by 17.7%, Estonia by 7.4%, Romania by 25.4%. All other Member States increased their budgets, with some minor exceptions.[3]

2. On methods and data availability, scope of the paper

Government Decision no. 475/2007, that launched the National RDI Plan 2007-2013 also determined a mid-term evaluation, again following good practices. This mid-term evaluation has been performed by Technopolis Group in collaboration with two local partners (FM Management Consultancy and GEA Strategy & Consulting)[4]. The main sources of information used in this evaluation were: (i) funding data (the National RDI Plan 2007-2013 has foreseen the collection of data according to 74 result indicators, 59 without overlaps), (ii) numerous policy documents (of which a major share has been and still is available on the internet), (iii) eleven focus group discussions (with 128 participants in total) and (iv) 68 interviews with research policy makers and research performers. The focus groups were supported by international experts, having their expertise both in the respective thematic priorities as well as either in research management or in research policy. A survey was not considered appropriate due to an expected cultural bias in the response behaviour that would have been difficult to control.

Unfortunately, the funding data and data concerning results and impacts has turned out to be rather poor particularly in terms of availability and coverage. Therefore the main sources of the evaluation – documents, interviews, and focus groups – were qualitative by nature.

This paper is mainly motivated by its content rather than by theoretical or methodological considerations. It covers the National RDI Strategy and Plan 2007-2013 but at the same time it addresses the wider Romanian research and innovation (policy) system. Most findings might be considered useful for future policy making in the field of research, development and innovation policy not only in Romania, but also for most of the new Member States. As such it can be considered a benchmark valuable for future policy making. Therefore, it is mainly organised as a checklist comprising lessons and recommendations.

3. The overall policy set-up: strategies, plans, programmes, institutions, criteria, and policy intelligence

1. Romania has a fully-fledged research policy system. It has quickly adopted up-to-date policy concepts, and has also implemented them. Examples are agencies for implementing policies, councils for supervision and advise; foresight exercises, programme planning, calls for proposals, evaluation procedures and indicators, monitoring systems, certification and accreditation of research performing institutions, and, not least, access to numerous international policy networks. The systems and processes in place allow the implementation of the whole policy cycle.

2. Any kind of improvement of the Romanian RDI policy does not require implementing new systems and processes. Improvements can be achieved by re-thinking the profile of existing elements and their relationships. There is, however, room for improvement. As the system stands now, the main thrust of required improvements is aiming at reducing complexity, simplifying and stabilising processes, sharpening the profile of actors, strategies, and plans, and establishing a thorough and robust system of policy intelligence in order to allow evidence-based policy making. The subsequent items will address essential issues and provide recommendations for their improvement.

3. Romania has launched a National Strategy that claims to address major economic and societal problems: creating new knowledge, increasing economic competitiveness, and increasing social quality. Catching-up to European levels of development is both an impetus and a goal. As the Strategy was deliberated at the end of 2005 and in 2006, i.e. on the eve of accession to the European Union, one can clearly see the 'spirit of departure'.

4. The Strategy has mainly been developed in an extensive foresight process – the first of its kind in the country. In hindsight the foresight process was too ambitious, too much focused on opportunities and the content of research and related thematic priorities. In contrast, it is rather poor as regards to challenges, shortcomings, and bottlenecks in the Romanian RDI system. Further, it was too much driven by research providers, but much less by research users[5]. An evidence-based analysis addressing the multitude of problems inherent in the Romanian research system was largely missing. To name just the most urgent problems: migration of talented students, alarming decline of RDI in the enterprise sector, the silence of research users, the urgent need for 'hands-on' innovations both in industry as well as in the public sector (esp. energy, health, environment, transport). At the same time, the foresight process was not followed up by a separate process of agenda setting, i.e. focusing and selecting a smaller number of priorities and related actions. The foresight process therefore ended half way: Nine thematic priorities were detailed into 148 sub-priorities; 3 strategic objectives were split into 5 specific objectives, which were then broken down into 22 measures, to be adopted by 14 different target

groups. Further in this 'open loop': it was planned to monitor the implementation of these 22 measures / 148 sub-priorities by 74 result indicators.

5. The fallacy of thematic orientation. The National RDI Plan 2007-2013 by intention closely followed FP7 both in terms of thematic profile and instrumentation. While this can certainly be considered a highly pragmatic decision, it has created a number of problems and some blind spots. There are in fact two major problems. One is the strong believe in thematic priorities (ICT, energy, environment, life sciences, etc.) rather than in structural approaches aiming at the strengthening of institutions. The other one is that while FP7 and all prior framework programmes did not focus on the broad themes per se but on carefully selected sub-fields, the National RDI Plan 2007-2013 includes the widest range of topics, in total 148. In doing so, there was de facto no priority setting, rather a reproduction of existing thematic profiles. This outcome was very much amplified by the chosen procedure through which the priorities were set, namely by the foresight exercise and its participatory character that involved hundreds and thousands of experts in the field, mainly research providers. At the same time, the broad coverage opened up numerous opportunities at policy level, namely to link research policy with sectoral policies, e.g. in the field of energy, environment or agriculture. Unfortunately, these opportunities were not taken advantage of, mainly due to the inherent difficulties of taking sectoral ministries and related policy makers on board – even though the sectoral ministries supervise 19 out of 45 National Institutes, which is a Romanian speciality.

6. The fallacy of adopting best available policies by adopting European programmes. European policies are mainly restricted (i) to regulation and (ii) to funding. Other instruments such as ownership and related institutional funding hardly occur at European level. At the same time, these are the dominant policy arenas at national level, at least where public budgets are concerned. Paradoxically, the National RDI Plan 2007-2013 does not relate to the institutional setting and related problems, rather it exclusively adopts FP7-specific policy elements such as programmes, instruments, calls for proposals, funding of projects, involving external experts for supporting funding decisions. In doing so, the Plan comprises 6 programmes, split into 38 courses of action, up to 30 evaluation criteria per funding instrument, 74 result indicators. The evaluation criteria in particular do have a bias towards project-related parameters rather than institutional, strategic, or managerial aspects.

7. By focusing on European programmes, the 7th Framework Programme (FP7) has received the highest attention as a role model, while RDI programmes from the Structural Funds were hardly considered an opportunity for extending national budgets and range of action. Most EU 12 Member States doubled their national RDI budget by allocating substantial shares from Structural Funds to RDI[6]. Romania is an outlier as it has planned only for 40% of its national RDI budget to be additionally funded from Structural Funds, a clear indication of a different set of priorities – and of a missed opportunity. What is more, the adoption of FP7 as a role model for good policy making has contributed considerably to a systems overload and an overly fast pace in policy implementation.

8. The rapid adoption of a broad range of advanced policy tools and practises is correlated with the large number of problems the Romanian research system is confronted with. In the light of the numerous (perceived) problems and challenges Romania's economy and society are facing, it was quite an obvious strategy to adopt rather more than less measures. What was however missing – here we are referring again to the foresight process – is a thorough analysis of the dominant problems, their interrelatedness and an estimation of the room for manoeuvre and timing, as regards change and related actions for change. Therefore, we can find a dominance of solutions over problems and the presence of too many solutions. The policy planning process has failed to identify a few 'focussing devices' that would have directed the attention of particularly those actors that run the system at different levels.

9. Developing agency functions with determination, but only half way. Romanian research policy has adopted a rather advanced policy element, namely the separation of making and implementing policies. One of the most relevant decisions was to merge the former three agencies (AMCSIT, CNMP and UEFISCSU[7]) into one single agency (UEFISCDI[8]) and to appoint three councils (CNCS, CNDI, and CCCDI[9]) overseeing it. At the moment, these institutions are far from being well balanced both regarding their own mission and structure as well as in relation to each other. UEFISCDI in particular refused to consolidate funding data on the National RDI Plan 2007-2013 prior to the merger into a single agency. Major parts of an agency's tasks are not performed by the agency itself, but by the appointed councils, CNCS and CNDI. Examples are preparing information packages, establishing quality standards, or proposing new programmes, to name just the three most time consuming tasks. All in all, there is a

substantial imbalance between UEFISCDI on the one hand and the councils and ANCS[10] on the other hand. The division of labour between UEFISCDI and the councils therefore calls for a thorough task review.

10. The three councils, if they take their job profile seriously, are occupied with several person years' work and take over substantial government and agency functions. The task lists of the three councils contain numerous relevant tasks and functions of an advanced RDI policy system. Some of them are operational, others are supervisory, and a third group is providing advice. At present, there is evidence that individual councils' members do have diverging perceptions of the councils' roles, which is not really surprising given the extensive list of up to 28 functions. Non-professionals perform tasks that require detailed professional expertise, e.g. drafting information packages, developing methodologies for evaluations or drawing up proposals for new programmes and actions. All in all, the councils suffer from too many task assignments; many of them are inherently conflicting and there is an unhealthy division of labour between the councils on the one hand and UEFISCDI and ANCS on the other hand. In the future, the scope of roles attributed to the councils should be reduced. Operational tasks should be transferred to UEFISCDI. The councils should act as supervisory bodies, overseeing UEFISCDI with respect to an explicit list of issues that should mainly concern the relationship between UEFISCDI and ANCS. For another list of issues, they should act as sources of advice. In order to improve policy intelligence, the council should in any case act as 'eager readers'.

11. The National RDI Strategy and the National RDI Plan 2007-2013 and numerous related systems and actions suffer from overstretch of expectations. There are too many 'policy entities': 3 major objectives, 5 specific objectives, 39 derived objectives, 38 courses of action, 14 types of participants, 59 result indicators, 9 thematic priorities, 148 sub-priorities, 6 programmes, 20 different types of instruments, up to 30 evaluation criteria per instrument, 3 councils with up to 28 functions. This complex system can neither be managed nor communicated properly. At the same time, it is restricted to funding projects.

12. The implementation of the National RDI Strategy and Plan 2007-2013 is characterised by an overly rapid pace of change that has led to a significant loss of trust. To launch calls without announcing the date of at least the next call inherently creates uncertainty and stress. Similarly, the evaluation criteria changed from one call to the next. While in general the evaluation criteria had been improved, this was typically perceived as 'changing the rules of the games while playing the game'. The suspension of calls in 2009 and 2010 and the retroactive haircut of already contracted grants (the most influential factor) were major elements in creating uncertainty. Further in the series of substantial changes: the merger of the implementing agencies, the change in conditions by which research institutes are certified / accredited. All these changes took place within three to four years; all in all too short a period for adaptation, institutional learning, consolidation, and establishing routines.

13. Extensive data collection and reporting, but moderate policy intelligence. While there is extensive data collection, reporting and provision of information to the public, a thorough and in particular systematic monitoring of funding activities is lacking. A vast majority of the pre-assigned (result) indicators is not available. Information collection and reporting is mostly performed on demand and ad hoc. Annual reports often do not have the same format, which would allow tracing certain trajectories; editorial care is insufficient, again and again. However, the bottleneck is not primarily the provision of poor data and reporting, rather it is the limited demand for information. To coin it this way: "It's not the library, it's the eager reader that is missing!"

14. The sets of criteria for project evaluation are too complex for practical handling; they suffer from inherent biases, and have some blind spots. On average, more than 20 criteria are in use. In practical contexts it is difficult to handle such complex systems and to keep the criteria transparent. This leads to an uncontrolled use, as project evaluators tend to follow their own criteria. Criteria tend to be interrelated, which leads to uncontrolled biases, and eligibility criteria often duplicate the evaluation criteria. Despite the large number of criteria, there are some blind spots. The most relevant missing aspect in the evaluation criteria is the reference to the organisation that performs the R&D project, i.e. the question whether the project will contribute to increasing the performance of the institution. The sets of criteria for project evaluation should thus be revised and simplified. The guidelines to follow are (i) reduction of the number of criteria, (ii) disentanglement of criteria to minimise interrelatedness, (iii) homogenisation between programmes, (iv) introduction of thresholds in the core criteria, and (v) deletion of 'clarity' criteria. Eligibility criteria should have the form of a checklist of objective parameters so that administrative staff can perform eligibility checks.

15. Involvement of external experts in proposal evaluation has undergone substantial improvement. Initially, proposal evaluation involved solely national experts. In the course of time international experts

have been included. In some programmes all evaluators are from abroad. The involvement of international experts – provided they are invited for site visits – can significantly contribute to exposing Romanian research to the international scientific community. This should be considered an important long-term resource; hence it should be managed properly and with patience and persistence, as these investments will not be paid back within a few years.

16. Recommendations concerning the overall RDI policy set-up. To summarise this chapter on the policy set-up, referring to strategies, plans, programmes, institutions, criteria, and policy intelligence, the most relevant recommendations are as follows:

- The overall alignment of RDI policy with the 'grand challenges' of Romania's economy and society should be a top priority, all the more so as the European Union will address more or less similar issues in its 'Horizon 2020'. Therefore, related exercises should be learnt from, but not copied and pasted!
- Accordingly, an experimental (!) set-up to systematically link RDI policy with selected sectoral policies should be approached. Preferred sectors could be agriculture, health, and energy – three top rated policy sectors, particularly in Romania. The on-going re-organisation of the National Institutes can be an advantage. Again, tailwind from Brussels should be welcomed, cf. Horizon 2020 and related policy activities in the context of 'grand challenges'.
- Planning for the next generation of Structural Funds 2014-2020 should be systematically linked with planning for national RDI policy. The Structural Funds should be considered a resource that genuinely enlarges the scope and resources of national policy. For obvious reasons the Structural Funds should address regional aspects. A regional focus is urgently needed, particularly in the light of only a few dominant research sites (Bucharest, Cluj Napoca, and next to them Iasi and Timisoara) and the danger of drying-out of other regions.
- In all future planning a stronger focus on institutions and their empowerment should be applied. This is one of the major lessons to be learnt from the entire evaluation exercise. There are at least two approaches how institutional aspects can be considered more explicitly: (i) a stronger consideration of organisational and strategic aspects in project proposal evaluations, (ii) a move towards bigger projects, which necessarily includes a stronger reference to the institutions applying: fit with long-term strategies / research agenda, management capability, recruitment and human resource development, availability of technical infrastructure and administrative capacities. A move towards bigger and longer assignments would provide more stability and confidence on the side of winners, while those who fail have to re-think their position. Such a policy would support a shakeout, which is certainly an appropriate policy goal for the next planning period.
- Whatever will be done in terms of goal setting and strategy development or establishing criteria, all actions should aim at reducing complexity, focusing on a fairly small number of 'salient features'. Experience shows that it is possible to oversee even big institutions or research programmes with a one-digit number of criteria, parameters or chapters. Strategies, goals, criteria, etc. should be formulated in a way that they can be related to management and/or policy actions.
- The division of labour between UEFISCDI and the three councils (CNCS, CNDI, and CCCDI) urgently calls for a thorough task review, aiming at an enrichment of the profile of UEFISCDI and a reduction of tasks of the councils, whose focus should be on supervision and advice.
- UEFISCDI should set-up a thorough information system including an IT-system, databases, indicators, and reporting. However, this set-up must not start by investing into IT-system or databases but should start from a thorough understanding of users and their information needs (cf. 'eager reader'). After having completed this 'requirement engineering' step, the procurement, programming, and data collection may start. Complementing the database with historical data, particularly regarding the bigger programmes (Human Resources, IDEAS, Partnership), should be high on the agenda. A thorough quality assurance is a must.
- All these steps are relevant in a long-term perspective, i.e. within the period leading up to 2020. A thorough reformulation of the objectives of the on-going National RDI Strategy and Plan 2007-2013 is neither necessary nor easy to achieve. Small adjustments will not address the major problems; rather they would be perceived as another distortion. Fundamental changes on the other hand would require a thorough reworking of all subsequent steps such as new / adapted thematic and structural priorities, related programmes and instruments, not least funding criteria. All these changes are not feasible within a year, particularly vis-à-vis the expectation that they would be implemented in a way to cause effects within the current planning period.

4. The launch of the National RDI Plan 2007-2013 and its perception by research performers

17. The National RDI Plan 2007-2013 was launched in 2007 and 2008 by implementing five out of six programmes. These five programmes were implemented themselves by 17 out of planed 20 specific measures. A total of 4,920 projects were funded by end of 2008. In the years 2009 and 2010 only some small measures in the Human Resource programme were launched. By end of 2008 978.537 MROL (6,52% of overall budget) had been spent. There was some downwards adjustment as a number of projects experienced a haircut, while for the measures in the Human Resource programme funding was maintained. At the end of the first four years out of seven (2007-2010) not more then 10% of the originally planned budget was committed.

18. The projects funded within a thematic priority are unevenly distributed across different programmes. While ICT and health are fairly evenly distributed across the different programmes, all the others exhibit substantial variations. This is a clear indication that 'research triangles' have emerged that are defined (i) by a thematic field (technologies), (ii) by the composition of the research performers (organisations), and (iii) by a set of policy instruments (interventions). These research triangles do have a national profile as they represent their specific organisations, their structure and strategic set-up.

19. When comparing actual uptake with the planned uptake according to instruments, one can see that the Human Resources, the Ideas and the Innovation programmes have not consumed their earmarked shares of budget, while others have been overbooked, particularly the Capacities but also the Partnership programme. These deviations are considerable, and they can be understood as a mirror of the availability of proposals that were considered 'good enough'. While the uptake of Capacities is rather obvious – out-dated equipment and a certain appetite of researchers 'to go shopping' for new equipment –, the high uptake of the Partnership programme can be seen as a propensity for collaboration in the Romanian research system. This is in contrast to poor collaboration at international / EU level, where Romania ranges lowest, both in terms of participation as well as in terms of success rate, despite the thematic and structural identity between the National Plan and FP7. Even more: relative participation in FP7 has declined also during those years when no national calls for proposals have been launched.

20. Ideas, the programme aiming at funding exploratory research, reveals a sharp segmentation in the Romanian (academic) research system: 20% of all institutions that received funding from the Ideas programme obtained 80% of all grants. What is more, three institutions (out of 117) received more than a quarter of all grants for exploratory research projects (PCE); four (out of 117) received one third, and eight (out of 117) institutions half of the grants. The Ideas programme is clearly dominated by the university sector. One can consider this sharp 20:80 segmentation to be a clear indicator of strengths and the presence of a critical mass in the Romanian research system.

21. The same pattern prevails in the Partnership programme: 1.1% (10) out of all (948) performers represents a quarter of all participations. A total of 18 institutions (1.9%) cover one third, 44 (4.6%) half, 100 (10.5%) two thirds and finally 212 (22.3%) 80% of all participations. This clearly indicates a dominance of a small number of institutions. Provided this rather small group of high-performing institutions does have efficient management and governance systems in place, they can act as poles for future development and growth. No doubt, if these institutions are willing and able to implement effective organisational support systems, adopt strategies that stimulate and reward performance and quality, set up appropriate recruitment and career policies, etc., they can play an essential role in the anxiously awaited catch-up to international standards. These top performers can be identified in any thematic priority.

22. The spatial concentration (clusters) even enhances these interventions: Bucharest and Cluj Napoca are ranging top, followed by Iasi and Timisoara. Both aspects, the structural as well as the spatial one, can thus be considered strong leverages for future policy actions: In the short to medium term, it is certainly a good idea to focus on the institutions that have demonstrated performance in the past. However, in a long-term perspective extra efforts have to be made to maintain a minimum level of innovative activities in all regions.

23. Accordingly, there are two 'policy friendly' aspects in this 20:80 segmentation: One is the required shift of attention from thematic fields to capable institutions; the other one is that these performing institutions can be much better approached by policy actions than thematic fields could be. The only major precondition is to explicitly consider organisational, strategic, and managerial aspects in funding decisions. The already mentioned increase of project size supports such a shakeout policy.

24. Increase of the international exposure of Romania's research. Romania's researchers have substantially increased their publication activity in internationally recognised journals, notably by the factor 2. At the same time, the Thompson Reuters, the organisation running "Web of Science (WoS)" has reviewed its journals and included a substantial number of new journals. In the wake of this review, the number of Rumanian reviewed journals included in the WoS rose from 8 in 2005 to 60 in 2010, thus an increase by factor 7.5 – which is the good news. The bad news, however, is the fact that Romania's researchers have not really changed their attitudes as they still publish their articles in 'national international journals'. Therefore, it is urgently needed to re-direct attention towards true international publications.

25. Summarising this chapter on the launch of the National RDI Plan 2007-2013 and its perception by research performers, the following recommendations can be made:

- Do not change the architectures of the National RDI Strategy and Plan 2007-2013 for the remaining period (2012-2013), rather then try to launch the forthcoming calls based on the established procedures and criteria.
- As regards the evaluation of project proposals, try to involve as many international evaluators as possible. Try to invite them for personal meetings in Romania. The increased involvement of international evaluators does not alter the 'rules of the game' but serves a long-term investment into internationalisation of the Romanian research system.
- Whatever will be done, it should be done in a way to increase trust and confidence in the RDI funding system amongst beneficiaries.
- During the next year, a rigorous simplification process should be launched.
- ANCS is well advised to establish a process for the exchange of ideas particularly with the top performers in the field to better understand the scope of 'mutual amplification', i.e. while ANCS provides funding, the research performers complement with an improved management and governance system.
- ANCS establishes a systematic dialogue with the private sector and research users (cf. below).

5. Romania's perception of European programmes

26. There is a perceived European Programme (FP7) and a factual European programme for funding RDI (Structural Funds). Despite the fact that FP7 has served as a role model for Romania's National RDI Strategy and Plan 2007-2013, Romanian participation in FP7 is generally moderate and declined from year to year, even when no national calls for proposals in the respective years were launched. Projects with Romanian participation in FP7 exhibit a low success rate. The most relevant factor explaining this low success rate is that Romanian researchers collaborate with consortia that are not best suited for the projects they applied for.

27. For the EU 12 Member States the Structural Funds are the main source of European funding of RDI. While some EU 12 Member States have doubled or almost tripled their national budgets through Structural Funds, Romania has planned only for a 40% equivalent of its national RDI budget, a clear indication of a different set of priorities. After two thirds of the planning period (2007-2013) two thirds of the available budget has been contracted, which is highly consistent. At the same time and despite the sharp decline of national funding during a period of at least two years, only 9% have been reimbursed. This clearly indicates considerable problems in the management of the respective projects and contracts both by the beneficiaries as well as by the respective authorities.

28. The modest rate of participation, the very low success rate in FP7, and the non-reimbursement of Structural Funds budgets refer to fundamental problems. Improved information campaigns or specialised support services will not meet the requirements. The major bottlenecks are the non-management of research organisations together with a blind spot in RDI funding regarding organisational and managerial aspects. At the same time European programmes, particularly the Structural Funds are inherently bureaucratic, which clearly deserves management attention. Thus, increasing the awareness and the capacity for management – on both sides, research performers and policy institutions – will be key: competent staff, continuity, processes & systems, incentives.

29. Recommendations on how European funding can be better utilised for RDI

- For the period 2014-2020 the systematic involvement of Structural Funds in a possible National RDI Plan 2014 will be key. First because they will represent a major source of funding, second as they can be perfectly linked to national funding, third because they can be oriented to sectoral problems and challenges.
- Whatever will be planned, the role of industry and of research users, thus the conversion of knowledge into economic and societal goods and services should be strengthened. This particular emphasis on research users is critical, as research

institutions by constitution cannot do more than to produce more knowledge.

- The absorption of funding from the European framework programmes should not be a goal in itself. Rather it should be seen as a vehicle for the internationalisation of Romanian research. The fact, that 1,700 young people have left their country to do their PhD abroad should be read as an alarming sign for an overdue internationalisation of Romanian research.

6. Beyond evaluation and funding: The National RDI Strategy and Plan in times of crisis, perceived by research performers and research managers

30. The suspension of calls in 2009 and 2010 and the retroactive haircut of already contracted grants were major elements in creating uncertainty and mistrust. The research system responded with a decline in total employment at the cost of non-researchers; the number of researchers, however, remained more or less unchanged during the crisis years. Many of the critical comments from researchers and managers concerned are arguable, as they refer not only to the budget cuts by the government. They also indicate missed opportunities, lack of strategies and management actions on the side of researchers and research managers, e.g. a sharpening focus, reorganisation, merging activities, partnering, exchange of staff.

31. Due to lack of awareness of R&D actors of their own missions and roles and range of action muddling through has been the dominant 'strategy' in coping with the crisis. Hardly anyone has reacted to the crisis by implementing strategically relevant decisions such as re-orientation of research fields, mergers, closedown or collaboration. This muddling-through attitude was to a large extent rational in itself as the crisis, its origins, and its impacts were themselves fuzzy and difficult to grasp.

32. However, most research performers/ managers are aware that they need to pay more attention to more systematic management efforts and strategic orientation. The range of topics to be addressed is rather broad: continuity of funding and of research performance, managing the trade-off between using limited financial resources to invest in research infrastructure and or continue research activities, the ambivalence of collaboration, particularly at international level, the critical role of young researchers, the need and role of institutional funding, the quality of research and changing criteria, (poor) interaction/collaboration with users, etc. Overall, one of the positive impacts of the crisis is the increased awareness and sense of urgency promoting a more managerial and strategic approach to the business of performing research, development and innovation.

33. Recommendations based on lessons from coping with the crisis, besides the obvious appeal for predictability and robustness of the policy institutions

- Make the research managers more aware of the need to re-think their organisations and their own role within their organisations, as "management is the difference which makes the difference!"

7. And where is the private sector?

34. Here, we have a somewhat mixed picture. While Romania in general can be perceived as an entrepreneurial economy, the share of technology-based firms, and respective start-ups, is comparatively low. Multinationals are more or less disconnected from the national research system as they mainly import technologies; however, they are interested in ensuring the recruitment of qualified young engineers and managers. Other larger national firms are widely absent when it comes to collaboration with the public research sector. If private firms collaborate, they do it intermittently. Only a small portion (7%, 95 companies) has taken the initiative to coordinate collaborative projects.

35. Recommendations how to attract the private sector and research users

- It will certainly be necessary to invest not only in the funding of private firms', or more general of research users' RDI activities, but it will also be advisable to oblige the public research sector to conduct a certain number of activities with the private sector/research users. To force these public institutions – e.g. via performance contracts at institutional level or funding contracts at project level – is certainly much more effective than to establish general promotional activities.
- The larger/international companies deserve a separate dialogue as they are largely absent from the public research sector and policy measures.

8. Concluding remarks

The Romanian research policy system has adopted and implemented a very broad set of policy elements. There is literally nothing that has been left out. This demonstrates that it is possible to adopt a fully-fledged research policy system within a rather short period.

A closer look, however, reveals a strong dominance of supply-side approaches. Quite often, these supply-side approaches emerge under the notion of 'best practice', which are easily available from various manuals, seminars, consultancies and, not least, the European Commission.

While there is a strong orientation towards problems and challenges in the Romanian economy and society at the overall strategic level, the respective actions to link generic RDI policy with sectoral policies are rather weak – like in most other countries, thus hardly surprising. In fact we could observe a high degree of over-expectation, which has certainly been fuelled by the spirit of departure on the eve of the accession to the EU.

Particularly, we observed a bias in the priority setting process in two regards: (i) the foresight process has not been followed up by a separate process of agenda setting, (ii) the composition of participants in the foresight exercise was dominated by representatives from the public research sector at the cost of industry and research users.

As most of these policy elements were implemented within the shortest time possible, there were of course strong needs for learning and improvement. Policy makers indeed started implementing improvements. However, this has led to a rapid pace of change during the implementation of the respective policies, and, unavoidably, to a high level of perceived uncertainty amongst research performers.

The next planning period can and should learn from the experience of the development and implementation of the present National RDI Plan 2007-2013 by putting highest attention to the following principles and orientations: Reduce overall complexity of the policy system. Link the next generation national RDI policy with the use of Structural Funds for RDI. Abandon the orientation towards a very broad range of economic and societal problems and challenges. Instead, address a few carefully selected areas, mainly to learn how to link RDI policy with sectoral policies. Health, agriculture, and energy are preferred candidates. Put the performance of institutions into the centre of attention. Support people rather than projects.

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[2]Government of Romania, Ministry of Education and Research, National Authority for Scientific Research, National Strategy Research-Development and Innovation in Romania. 2007-2013. 2006, Bucharest, Government of Romania, Ministry of Education and Research, National Authority for Scientific Research, National Plan for Research, Development and Innovation for the period 2007-2013. 2007, Bucharest.

[3]Innovation Union Competitiveness Report, 2011, p 66, http://ec.europa.eu/research/innovation-union/index_en.cfm?section=competitiveness-report&year=2011 Other Member States with moderate negative growth rates during 2008-2009 are Belgium (-2.3%), Ireland (-1,8%), Italy (-1.6%).

[4]Fritz Ohler, Alfred Radauer, Niki Vermeulen, Mădălin Ioniţă, Flaviana Rotaru, Ana-Cristina Ţoncu, Dragos Pislaru, Manfred Horvat, Mid-Term Evaluation of the National Strategy and of the National RD&I Plan 2007-13, Technopolis Group Austria, FM Management Consultancy and GEA Strategy & Consulting, Vienna & Bucharest, 2012, http://www.ancs.ro/ro/articol/2775/despre-ancs-organizare-mid-term-evaluation-of-the-national-strategy-and-of-the-national-rd-i-plan-2007-2013

[5]The dominance of research providers reminds of Georges Clemenceau's statement "War is too important to be left to the generals!".

[6]Innovation Union Competitiveness Report, 2011, p 255

[7]AMCSIT: Agenţia Managerială de Cercetare Ştiinţifică, Inovare şi Transfer Tehnologic, CNMP: Centrul Nţtional de Management Programe, UEFISCDI: Unitatea Executivă pentru Finanţarea Învăţământului Superior, a Cercetării, Dezvoltării şi Inovării, UEFISCSU: Unităţi Executive pentru Finanţarea Învăţământului Superior şi a Cercetării Ştiinţifice Universitare

[8]Unitatea Executivă pentru Finanţarea Învăţământului Superior, a Cercetării, Dezvoltării şi Inovării (UEFISCDI)

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[10]ANCS: Autoritatea Naţională pentru Cercetare Ştiinţifică