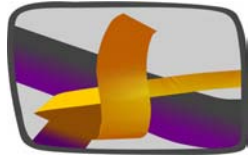


SHAPING THE EUROPEAN RESEARCH AREA: SCIENCE POLICIES FOR AN ENLARGED EUROPE



**THE SEMMERING PROJECT
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FINAL REPORT

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Abstract

This report documents the activities of the SEMMERING project and its main results. Set up as a thematic network SEMMERING organized three major conferences to discuss contemporary S&T challenges with regard to structural reform, research programming, research excellence and research networks. The results of the SEMMERING project advocate a re-orientation of S&T and RTD policy reform, including of research programming at European level. Specifically the SEMMERING network is calling for (a) the combination of middle-range incentives to engage the industry and the private sector in the financing of research with long-term continuous financing of research structures by the state in the form of subsidies as well as increased investment into education at all levels; (b) the revision of statistical frameworks for measuring RTD investment; (c) the revision of accounting frameworks at the institutional, programme and project level away from rigid financial rules; (d) new employment policies in the research sectors that balance short- and long-term objectives; (e) a move away from the 'one size fits it all' mentality characteristic of the early stages of the Sixth Framework Programme; (f) a recognition of diversity in research cultures, approach and organizational format as a positive element for the creation of critical mass; (g) the integration of the research community in the process of research programming following the 'self-management' principle.

1 Executive Summary

The SEMMERING project was launched in late 2001 against the background of the consolidation efforts with regard to the European Research Area and the onset of the Sixth Framework Programme and with the objective of providing a forum for the critical reflection of related policy developments.

The main objective of SEMMERING was to foster a network of researchers and decision makers all over Europe to tackle relevant S&T issues for international and trans-national research co-operation in the context of enlargement and the deepening of the European integration process.

The 'Semmering Forum' forum pre-existed the implementation of the SEMMERING accompanying measure in the Fifth RTD Framework Programme. The three conferences organized in the framework of this contract represented the Sixth, Seventh and Eight Semmering Forums.

The Sixth Semmering Forum was organized in Lille (France) on 6th-8th December 2001 under the title 'Rethinking Research Policies in an Enlarged Europe'. The conference was concerned with changes in the institutional structures of research – especially in the New Member States, including with regard to the public-private interface and the accompanying shift from the institution to the network as the locus of research management and design.

The Seventh Semmering Forum took place in Warsaw (Poland) on 17th-19th October 2002. Its overall theme was 'Research Programming for Excellence; Is it Possible and, if so, Desirable?' and it was primarily concerned with the shift towards the governance of science, and the implications of this for the definition and evaluation of excellence.

Finally the Eighth Semmering Forum took place in Brussels (Belgium) on 10th-12th November 2003 and dealt with new collaboration cultures.

All three conferences – that were attended by between 45 and 55 participants each with a strong representation from the New Member States (at the time accession countries) – were also used to discuss the developments with regard to the Sixth RTD Framework Programme. The latter was given particular attention at the last Forum which had as explicit aim to reflect on the experiences made during the first phase of the Sixth Framework Programme.

The main conclusions of the SEMMERING accompanying measure can be summarized under five themes:

- S&T structural reform
- The governance of science – a new paradigm
- Excellence in research in national and international contexts
- Networking for excellence
- The Framework Programme and the social sciences.

S&T structural reforms are notable in the New Members States, the post-Soviet States but also the EU-15. In the New Member States and despite the swift conclusion of the science and research chapter of the accession negotiations the regulatory frameworks are still not entirely in place and public and private investment in RTD still lags behind. A significant feature of the difficulties encountered has to do with the absence of a national innovation system (NIS) as an institutionalized mechanism in which science, the business community, public and private

research organizations and the educational system are working together in an interactive way to come to a permanent exchange. State institutions often fail to perform related S&T functions effectively and the tendency to view innovation systems in isolation from higher education means that the research base continues to be at risk of erosion.

Brain waste and brain drain is also characteristic of the NIS, where reforms have led to the further thinning out of already poorly-supported research infrastructures. Arguments for lessening state control over the process of transition have proven flawed in many cases and especially in transforming the R&D system. The weakness and uncertainty of S&T policy has conspired with the economic crisis to inflict losses of human power and technical assets in all post-Soviet states, and indeed to produce unfavourable structural changes. R&D 'assets' are considered largely as a liability, except in the very special case of the new Federal Research Centres created to cover a small number of sensitive fields (largely of military or direct economic relevance).

Funding pressures and organizational difficulties are equally at the heart of the dynamic transformation of S&T systems within the EU-15. A key problem is the absence of institutional procedures appropriate for a diversified and a heavily networked research system. Intermediate bodies should themselves be diversified and set within a framework of cooperation and competition rather than authoritative allocation. Initiatives arising at the nodes of a networked system require forms of support that are rather different from those that operate within a hierarchical priority-setting and resource-allocation system.

Several well-known 'remedies' for reforming or advancing national S&T and innovation systems including the concentration of resources, the use of incentives to support industrial engagement

in RTD, or the introduction of competitive mechanisms to govern employment in research organizations are slowly being recognized as neither consistent (with each other and the underlying conceptual model of an innovation system) nor effective in reaching their objectives. This becomes especially obvious with regard to policies established to promote public-private interfaces.

An overview of policy initiatives and issues across several countries over the period 1987-2000 points to a common direction of change: there are no major policy initiatives that actually go back on the governance trend. The climate is one of change in the direction of 'steering' policies using negotiation and, above all, incentive structures, rather than major institutional transformation, aggregate planning, top-down priority setting, strategic resource allocation, and other techniques that correspond to our ideal-type of 'government'.

There are different reasons for this **general shift towards governance**. The nature of research by default supports the use of negotiation and incentives as levers of state policy. Perhaps more important is the process of internationalization in conjunction with increasing competitiveness, not least within national science systems. Internationalization favours the autonomy of the research sector *vis-à-vis* the national government, it enhances external evaluation procedures, it produces new sources of funding and modifies the meaning and impact of concerns about 'competitiveness'. But national demographics in the research field are also part of this context, as national research sectors seem unable to provide stable positions for their researchers, and as competition between candidates seems more intense than ever. The growing consciousness among policy-makers of the importance of the quality of research for enhancing economic competitiveness is also related to this change in the policy levers. The introduction of competitive funding as well as of regular

evaluation procedures are tightly linked to the idea that only good and 'useful' research deserves funding.

These shifts relate to three types of changes that have occurred in RTD policy: first, changes related to demographics and career structures; second, changes in the normative views of policy, and third, changes related to internationalization. The governance of and in science has gradually emerged into a new paradigm for research programming against the background of structural reforms. However, this new paradigm is not unproblematic.

What stands out is the ever-increasing emphasis on the 'usefulness' or 'policy relevance' of research as the key defining element of **excellence**. In turn, this emphasis on the 'usefulness' of research has implications in two ways: first, with regard to the research agenda (at programme and project level) and, especially, how this is or should be defined with reference to stakeholders or users; second, with regard to the industrial share in RTD funding.

The so-called societal demands on research are often intermediated to scientists by science policy-making institutions through calls for trans- or inter-disciplinary research or science communication, or stakeholder involvement. The expectation for science to contribute to the public interest is not new. However, its conceptualization has changed. In the past, this 'social contract' was translated into a division of roles between government and scientists, with the former providing the necessary funding and conditions for the latter to be able to deliver the expected knowledge, inventions and contribution to the welfare of society. Under this theoretically imagined contract, scientists retained autonomy over their work and social organization, with internal modes of accountability. In return, they were expected to provide the solutions for future societal and political challenges. At present, scientists are expected to prove that they are contributing

to this interest through elaborate science communications (or so-called dissemination / exploitation strategies) as well as stakeholder involvement in the definition of research questions and the arrival at policy conclusions. Equally, they are expected to carry out inter- or trans-disciplinary research, albeit understood as overcoming disciplinary boundaries rather than integrating disciplinary approaches. This shift is also evident in the transformation of research councils away from self-government. Research councils are increasingly less run by scientists, the latter comprising one of several 'stakeholders' in the definition of research priorities.

Yet the notions of 'knowledge producers' and 'knowledge users' are both very broad – there are different modes and paradigms in different branches of science, as well as different groups of users in economy, policy and society. Industry-research interactions might differ from policy-research interactions with regard to both expectations and outputs. Given this, it is important to reflect on whether the notions of 'dissemination' and 'awareness' are indeed the right ones to use. This does not mean that one should drop the idea that research can and should be useful to a wide range of knowledge users. There are good reasons why scientific research in earlier times was criticized for taking place in the context of an 'ivory tower' devoid of any links to the real world. However, the conceptualization of 'usefulness' alone in the framework of a research project (i.e. limited time) and in a linear way (from user to researcher and back to user) is at best naïve and at worst dangerous for research design and quality.

The interest in the 'usefulness' of research is also linked to the greater emphasis on the role of industry for research, primarily as a source of income. Today, industrial interest in research is often a condition for getting state funding. More generally, this has supported the shift from core funding to commissioned or contract research on a project basis. But in fact the actual figures of private

RTD investment are likely to be overestimated. In the natural sciences and engineering the existing figures of private RTD investment tend to overlook that most of the private RTD funding streams into the own company with only a very small share used to finance research outside, i.e. in universities or research organizations. Furthermore, the requirement that research organizations or companies commit 50 per cent of their own financing to research endeavours in order to obtain public funding – a model quite appropriate for industrial research – is a doubtful instrument for mobilizing private investment into RTD in the case of basic research and the social sciences.

It is noteworthy that the co-funding as requested by most of the research projects under the European Framework Programmes does not, in fact, mobilize private funding, but national or regional public co-funding instead. It can be argued that such a mechanism does not just aim at increasing the funds available for RTD in Europe – thus contributing to the Lisbon goals –, but at increasing the stakes of national and regional administrations in research and its results. However, the results of this strategy are far from clear. Not all national research administrations support participation in European and other international research programmes through co-funding. Consequently, the general co-funding rule is a barrier for many to participate in top quality international research.

In any case, if even such strict requirements as co-financing are not succeeding in mobilizing the politically postulated increase of private investment into research, it might be time to recognize that a large part of pre-competitive research – the type of research that after all the RTD framework programmes of the European Commission also purport to support – is not interesting for industry at this development stage. Alternatively, one may question how ‘pre-competitive’ research can be if it aims at developing patents and licences as indicators for the success of research projects.

Interestingly enough this *problématique* was mentioned in several statements of the industry in position papers during the development of the Sixth Framework Programme. There was no unanimous acceptance of the New Instruments by the representatives of the industry who especially criticized the 'Networks of Excellence'. The SEMMERING consortium could not, however, establish how the final decisions on the Programme were made and what relation they bore to the preceding consultations.

The co-funding rule as a general model represents quite a narrow understanding of the subsidiarity principle. There are two options out of this dilemma:

- The first is to merely focus on that type of competitive research that is of direct interest to industry. This, in fact, appears to have been the orientation of the Sixth Framework Programme in its early phases. However, to do this also means, de facto, to drop any claim to scientific endeavour as of 'general' or 'public' interest and leave it to the market alone to drive intellectual entrepreneurship. Even if successful in the short-term, such a limited construction of knowledge is unlikely to bear any fruit in the long-term and will eventually undermine any innovation potential. This criticism was not merely voiced by the scientific communities, but by industrial milieus as well. Furthermore, such a bureaucratic vision does not only fail to meet the needs of the scientific communities and the industries, but shows a deep misunderstanding of the multi-facet structure of National Innovation Systems and the European Research Area.
- The alternative option more likely to achieve scientific excellence as a relevant element for global competitiveness in a more genuine sense is to move away from this reductionism

and one-sided view of knowledge and look for policies that recognize and do fairness to this diversity.

Similar considerations apply to the understanding and promotion of **research networks**. From the perspective of the definition of research objectives and legitimacy, 'networking', as proclaimed and practiced by funding or governmental agencies, often represents a new form of bureaucratization. This new form of bureaucratization threatens both research autonomy and real-life networking as practiced by researchers, i.e. based on a web of inter-personal relations that constitute a project that may be collective if not actually shared.

This is among else shown by the way the EC has been trying to 'create' the European Research Area (ERA), oblivious to the fact that this already exists, at least in a preliminary form. Undoubtedly, the Framework Programme played a decisive role in making the ERA sustainable, but it was not the only factor at work. The data suggest that it was built bottom-up, based upon ongoing scientific co-operation on the bilateral and multilateral levels among research communities as well as between research communities and industries. Those activities might have never led to fully developed research projects without the means allocated to the successfully bidding consortia. A relevant part of such consortia, however, were based upon networks which existed prior to the submission to and funding by the European Commission of one or more project proposals.

Networks in research are today conceptualized as primarily operating at the project level, i.e. with reference to a specific set of research objectives, running for a certain period of time and aiming towards a specific set of outputs that are 'useful' or relevant to a specific set of policies. This is a rather restricted definition of a network which tends to shift attention away from the structural

dimensions of a network, the human capital, technological capital and social capital dimensions. Interestingly, these dimensions are given much more attention in regional economics. Although the New Instruments seem to address this issue, the concept needs to be revised in a major way with regard to its implementation.

The findings of the SEMMERING project advocate a re-orientation of S&T policy reform, including of the RTD research programming at European level:

- S&T structural reform needs to be based on the real-existing structures for research and the public-private interface and not alone on their ideal representation by any specific model for innovation and S&T. Middle-range incentives to engage the industry and the private sector in financing research need to be combined with long-term continuous financing of research structures by the state in the form of subsidies as well as increased investment into education and its structural reforms at all levels. National variations and different options for the European regions limit the potential for success of the efforts of the European Commission in this respect.
- With respect to the evaluation procedures there is no doubt that the European research policies have had a major impact in establishing the awareness for the need of an evaluation culture across Europe. However, the actual procedures need to be revised in the light of past experiences. On the whole, evaluation procedures on the European level have not changed in a significant way during the past Framework Programmes. The procedures are quite inflexible and tend to favour mainstream projects rather than scientific excellence. Furthermore, even for cases of clear mis-judgements on the side of the evaluators there are no procedures to appeal against these errors. The quality of the evaluations has not just

increasingly faced criticisms from the research communities, but from high-level expert groups as well (cf. Marimon 2004).

- Statistical frameworks for measuring RTD investment need to be revised in order to adequately measure the sources of income for research as well as its forms of expenditures. Financial accounting frameworks at the institutional, programme and project level need to move away from rigid rules and make provisions that allow for long-term institutional and human resource development. The actual financial and auditing rules at the European level impede such an orientation and endanger the ambitious goals of the European Research Area.
- European research systems must finally recognize that the promotion of competitiveness within research does not presuppose that all research positions are short-term and bound to specific research contracts. There is a need for employment policies in the research sector that balance short- and long-term objectives and ensure that research capacity is built bottom-up at the level of individual research careers.
- Research programming needs to recognize that there is no 'one size fits all' approach to support research collaboration and research excellence. Clinging onto a narrow definition of research excellence and networking around the linear model of the use of research results undermines research autonomy and also misses the objective of producing knowledge that is both relevant for policy in the broader societal sense and generically relevant for the advancement of knowledge that might or might not become applicable in the future. Scientific excellence cannot be achieved without a certain acceptance of risks. Here is an obvious built-in tension between the financial and

administrative units on the European level and the research communities.

- Diversity – in research cultures, approach and organizational formats – is a pre-condition for the creation of a rich research base and critical mass. Research policies must orient themselves to this structural prerequisite.
- The research community must be integrated in the process of research programming. It is important that research councils or equivalent bodies at European or national level follow the ‘self-management’ principle rather than shift responsibility to a bureaucratic administration that is dis-embedded from the research process. The significance of consultation is recognized by the European Commission, however, the real-life procedures continue to represent more of a quantitative exercise than a methodologically sound procedure. True as it is that the Commission invites all stakeholders to voice opinions on the research programming little is known about how the responses are integrated in a way that could be labelled as ‘democratic governance’. Despite the Communication of the European Commission on Democratic Governance the procedure of the selection of experts remains vague.

2 Background and Objectives of the Project

The SEMMERING project was launched in late 2001 with the objective of providing a forum for the critical reflection of policy developments against the background of the consolidation efforts with regard to the European Research Area and the onset of the Sixth Framework Programme.

SEMMERING has as overall aim to foster a network of researchers and decision makers all over Europe to tackle relevant S&T issues for international and trans-national research co-operation in the context of enlargement and the deepening of the European integration process.

The specific objectives of SEMMERING were:

- To increase the knowledge of the European dimension in S&T and RTD policies and to understand the impact of national policies on Europeanization.
- To assess and compare the efficiency of S&T policy instruments in fostering outstanding research quality.
- To promote the European integration of the S&T sectors by examining the role of networks and the preconditions for their sustainability.

SEMMERING was implemented through a series of three conferences. Contractually, SEMMERING comprised an accompanying measure lasting 33 months from late 2001 to the Fall of 2004, i.e. it began towards the end of the Fifth Framework Programme and was completed mid-way through the implementation of the Sixth Framework Programme.

SEMMERING has built on the tradition established by the 'Semmering Science and Technology Forum' Meetings (named after the Austrian mountain resort in which the first such Forum took place in 1996). The Semmering meetings were designed to create a forum for fostering the better understanding and co-operation between the science and technology communities within Europe.

This final report of the SEMMERING project is structured as follows. Chapter 3 that follows describes the approach taken by the project and discusses its main findings. The discussions that took place at the three conferences of the Forum are synthesized under five themes: structural S&T reform (section 3.2), the governance of science (section 3.3), the question of research excellence (section 3.4), the role of networks in research and how to support them (section 3.5) and the developments at the level of research programming for the social sciences at the level of the EU RTD Framework Programme (section 3.6). Chapter 4 that follows draws policy conclusions from the discussion in chapter 3. Chapter 5 outlines the dissemination activities of the project and how these are being pursued after the contractual end of the SEMMERING project.

3 Scientific Description of the Project Results and Methodology

This chapter describes the approach of the SEMMERING project and its results.

SEMMERING was conceptualized as a thematic network with the principal objective, as we saw, of organizing a set of conferences to bring together scientists and relevant policy-makers to deliberate on contemporary S&T challenges. SEMMERING is not a typical research project (hence also its contractual set up as an ‘accompanying measure’) thus it is not useful in this context to talk about a research design. Nevertheless, the topics of the three conferences organized by the SEMMERING forum were selected in such a way as to produce a comprehensive appreciation of key issues of contemporary research policy and research practice.

In what follows we first describe the agenda of the three conferences. Subsequently we discuss the main findings drawing on the presentations and deliberations of the three conferences and the associated deliverables. The discussion of the findings is organized around thematic areas that by and large correspond to the three conference themes. However, insofar as several themes re-emerged in different contexts, priority was given to the cross-cutting analytical issues.

3.1 Three major conferences

The Semmering forum pre-existed the implementation of the SEMMERING accompanying measure in the Fifth RTD Framework Programme. The three conferences organized in the framework of this contract represented the Sixth, Seventh and Eight Semmering forums.

The Sixth Semmering Forum was organized in Lille (France) on 6th-8th December 2001 under the title 'Rethinking Research Policies in an Enlarged Europe'. The conference was concerned with the following topics:

- changes in the institutional structures of research – especially in the New Member States, including with regard to the public-private interface;
- the accompanying shift from the institution to the network as the locus of research management and design.

The Seventh Semmering Forum took place in Warsaw (Poland) on 17th-19th October 2002. Its overall theme was 'Research Programming for Excellence; Is it Possible and, if so, Desirable?' and it was primarily concerned with:

- the shift towards the governance of science, and
- the implications of this for the definition and evaluation of academic and research excellence.

Finally the Eighth Semmering Forum took place in Brussels (Belgium) on 10th-12th November 2003 and dealt with new collaboration cultures. All three conferences – that were attended by between 45 and 55 participants each with a strong representation from the New Member States (at the time accession countries) – were also used to discuss the developments with regard to the Sixth RTD Framework Programme. The latter was given particular attention at the last Forum which had as explicit aim to reflect on the experiences made during the first phase of the Sixth Framework Programme.

The proceedings of each conference were published electronically. A synthesis report was written up upon conclusion of each conference – these correspond to the three main deliverables of the project. The results were synthesized in a fourth and final deliverable as input into the development of innovative research policies. This final report draws on the debates reported and discussed in these deliverables. The annex to this report lists these deliverables. Both the deliverables and the agendas of the three conferences can be read / downloaded at the project's Web Site at www.iccr-international.org/semmering

In what follows we discuss the main issues that emerged in these three conferences.

3.2 S&T structural reform

In the last several years we have observed several changes in research policy frameworks, driven by funding pressures, shifting perceptions of scientific excellence and relevance, the need to adapt to internationalization, including Europeanization, and, not least, general changes in public management and governance.

Enlargement and the accession process has been a significant factor in internal processes of S&T reform in the **New Member States and associated countries**. The change is most obvious at the level of scientific institutions and individual scientists and slowest at the strategy level of S&T policy formulation and implementation, including the introduction of new regulatory frameworks. This is despite the rather swift conclusion of the science and research chapter of the accession negotiations. The strongest evidence of this are the continuing low levels of public and private investment in RTD and the bureaucratization of related processes.

A significant feature of some of the difficulties encountered in the transition period has to do with the absence of a national innovation system (NIS) as an institutionalized mechanism in which science, the business community, public and private research organizations and the educational system are working together in an interactive way to come to a permanent exchange. In several new Member States the enterprise sector continues to play a low role in scientific development. The state's role is significant in theory but problematic in practice – more specifically, state institutions often fail to perform related S&T functions effectively. Furthermore, there is a tendency to view innovation systems in isolation from higher education, an approach which is problematic in the long-term considering that higher education institutions are those to supply researchers to industry. Finally, the over-emphasis on the creation of 'new' knowledge tends to undermine the equally important function of the diffusion of existing knowledge, which indeed might be of more relevance for a system in transition.¹

In **Russia and the post-Soviet states**, empirical evidence regarding the state of research systems suggests that arguments for lessening state control over the process of transition were flawed in many cases, especially in transforming the RTD system. The weakness and uncertainty of S&T policy has conspired with the economic crisis to inflict losses of human power and technical assets in all post-Soviet states, and indeed to produce unfavourable structural changes. The government(s) consider it their main aim to mould the remaining national research capabilities into patterns that are useful for economic recovery. This implies that long-term S&T goals are given less attention and this leads to a vicious circle with more and more qualified personnel dropping out the research system. R&D 'assets' rather

¹ See, among else presentations of Adolf Filacek, Christo Balarew, Helle Martinsson, Judith Mossoni-Fried, Jadranca Svarc, Rossitsa Chobanova, György Darvas at the Sixth Semmering Forum, Lille, December 2001.

tend to be considered largely as a liability, except in the very special case of the new Federal Research Centres created to cover a small number of sensitive fields (largely of military or direct economic relevance).²

Funding pressures and organizational difficulties are equally at the heart of the dynamic transformation of S&T systems **within the EU-15**. A major problem is the absence of institutional procedures that are appropriate for a diversified and heavily networked research system. It is a natural feature of a diversified and heavily networked research system that its intermediate bodies should themselves be diversified and set within a framework of cooperation and competition rather than authoritative allocation. Initiatives arising at the nodes of a networked system require forms of support that are rather different from those that operate within a hierarchical priority-setting and resource-allocation system. Reforms in the EU-15 have occurred primarily at the level of research programming (see also next section) in an attempt to also bring about structural reforms in the way research is organized and carried out.

There are, by now, **several well-known ‘remedies’ for reforming or advancing national S&T and innovation systems**. These include recommendations such as

- the concentration of resources on basic and applied research in areas where a country has considerable scientific, technological and industrial potential;

² See, especially, Marie Laure Couderc ‘Russian Policy for the Promotion of Centres of Excellence’, presented at the Sixth Semmering Forum, Lille, December 2001 as well as Andrei Rezaev ‘Institutional Research Structures in the Russian Universities’, likewise presented in Lille.

- the creation of legal incentives for innovative enterprises that can contribute to international scientific and technological co-operation;
- the securing of legislative and normative protection of intellectual property created by scientists;
- the improvement of financing mechanisms for scientific and technological activity by mobilizing state and non-state resources for new technology; and
- the adaptation of the financial, credit and tax system to the innovation economy.

Perhaps the most important question raised by the above standard list is the extent to which these recommendations are consistent. For example, while in practical terms, given the specific national situation, they can no doubt be pursued simultaneously, it is arguable that the picture of the innovation economy implicit in those recommendations targeting enterprises or the financial and credit / tax systems is actually inconsistent with the idea of national priority setting by concentrating resources on selected areas. This inconsistency is a problem that lies at the heart of current policy debates and has by no means been satisfactorily solved.

Much of the difficulty in ‘planning’ an ‘innovation system’ lies at the rather **elusive public-private interface**. From the perspective of science, researchers tend to take it for granted that there is an opposition between public and private research – so much so that the distinction might be presented as involving two sociological ‘ideal-types’. There is a need for programmes that cognitively and symbolically frame a language within which the distinction between public and private no longer simply coincides with that between esoteric and exoteric. The relation between ‘public’ and ‘private’, which impacts on many aspects of current trends in

European research, cannot be reduced to institutional or legal features, but also brings into play, for reasons embedded in the social history of science, powerful normative issues.

3.3 The governance of science – a new paradigm

The implementation of a policy framework depends on the use of what we might generically call ‘policy levers’. There are three types of levers that can be mobilized by the state to pursue specific objectives: orders, negotiation and incentives. Orders are, by assumption, not relevant to a governance perspective. Therefore, negotiation and incentives are those levers practically available. These two policy levers of governance are compatible with the kinds of research structures that governance tends to produce.³

An overview of policy initiatives and issues across several countries over the period 1987-2000 points to **a common direction of change**: there are no major policy initiatives that actually go back on the governance trend. The differences are entailed into how these differences are brought about, not in their contents. In some cases, notably Sweden, change is a matter of explicit legislative reform; in others, notably Germany, it is more a matter of changing practices within established institutions with significant autonomy.

³ This discussion relies heavily on the presentation of John Crowley (of a paper co-authored with Elise Feron) of the results of the INNOCULT study on the internationalization of research. The paper is entitled ‘From Research Policy to the Governance of Research’ and was presented at the Seventh Semmering Forum, Warsaw, October 2002. See also Chris Caswill on ‘Boundary Crossing’ and Klaus-Heinrich Standke ‘The impact of international organizations on national S&T policy and good governance’ and Stanislaw Walukiewicz ‘Management in business and governance of science’ likewise presentations at the Warsaw conference.

In most countries, perceptions within the research sector are of significant change, associated in particular with increased funding pressures, modified career structures leading, among others, to greater difficulties in attaining tenured positions. Reforms may not have been implemented (as in France) or have produced less dramatic results than might have been expected or intended (as in Austria or the UK), but the climate is nonetheless one of change in the direction of 'steering' policies using negotiation and, above all, incentive structures, rather than major institutional transformation, aggregate planning, top-down priority setting, strategic resource allocation, and other techniques that correspond to our ideal-type of 'government'.

There are **different reasons** for this general shift towards governance. The **nature of research** by default supports the use of negotiation and incentives as levers of state policy. Perhaps more important in the contemporary context is the **process of internationalization in conjunction with increasing competitiveness**, not least within national science systems. Internationalization favours the autonomy of the research sector *vis-à-vis* the national government, it enhances external evaluation procedures, it produces new sources of funding and modifies the meaning and impact of concerns about 'competitiveness'. But **national demographics in the research field** are also part of this context, as national research sectors seem unable to provide stable positions for their researchers, and as competition between candidates seems more intense than ever. The growing consciousness among policy-makers of the importance of the quality of research for enhancing economic competitiveness is also relevant to understanding this change in the policy levers. The introduction of competitive funding, or of regular evaluation procedures, for example, seems tightly linked to **the idea that only good and 'useful' research deserves funding**.

The 'ideal' or pure model of governance can analytically be characterized as follows with reference to five key dimensions, namely, priority setting, research funding, employment policy, research evaluation and internationalization:

- Concerning priority setting, governance is characterized at the level of the state by an explicit, and at least theoretically autonomous, process of priority setting, and by the use of 'top-down' instruments. Moreover, the governance mode is highly responsive to the public debates, and to internal state issues.
- Funding includes basic funding (but at a lower level than in the government mode), in order to maintain the running of public organizations, competitive funding, and partnerships between public and private sectors, which can take the form of privatization. The basic idea is that when the private sector is able – and willing – to finance research, public research organizations do not interfere; but if the private sector does not provide the funds for a research perceived as necessary at the social level, the public research organizations are invited to do it, but on a competitive basis.
- Concerning employment policy, the first feature seems to be the competitive nature of recruitment. A system of tenure is *prima facie* suspect, despite its contribution to the research sector's autonomy. On the contrary, the governance mode favours fixed-term contracts, with competitive renewal. This renewal can take place either in a broad market perspective, or in a situation of internal competition, with promotions for career advancement.
- Evaluation of research must be carried out within the scientific community, because evaluation by non-academics may call into question the research sector's autonomy (which enhances

its capacity to meet characteristic contemporary policy objectives). However, it has to be formally and institutionally external, in order to avoid suspicion about researchers assessing themselves; for example, evaluation may be carried out by peers, but not by colleagues. The purest form of this formally external evaluation is internationalization, of which the involvement of foreign researchers in peer-reviews is an important aspect.

- In the governance mode, internationalization is an instrumental issue, because it is viewed as a way of promoting other objectives. If internationalization of research favours them, then the state will actively promote it, otherwise not.

The shift to governance in the research sector is undoubtedly driven by the agenda of competition, including privatization. The latter has complex origins and means rather different things in countries such as the UK, where the neo-liberal revolution was self-conscious, and in countries such as France where it is still largely unacknowledged or even rhetorically denied. Nonetheless, there is a genuinely common agenda, driven by, among other factors, the logic of the European single market, as embraced by both neo-liberals and their opponents from c. 1986. Effectively, the neo-liberal language of 'new public management' is one way in which a broader tendency can be formulated. The real shift towards a governance model of research policy is not, however, of a cultural nature, nor do differences between countries relate in any obvious way to cultural distinctions. Rather somewhat different strategic responses to changing environmental conditions appear adequate for explanatory purposes.

The main reasons for these shifts relate to kinds of changes that have occurred in R&D policy, which we can organize into three main categories.

First, **changes related to demographics and career structures.**

The research sectors in several countries have been affected by the scarcity of job opportunities, which reflect major structural changes since the 1960s. In the 1960s, traditional university systems were reformed in most countries. In the 1970s, many jobs were created, including a large proportion of tenured positions. However, this mode of hiring has progressively been questioned and abandoned. During the 1990s, access to academic careers has become more difficult in all countries, with growing numbers of fixed-term contracts and non-contract positions. As a result, differences within the academic professions have widened.

Second, **changes in normative views of policy.** There has been a change in the meaning of research as a policy issue, and in the objectives assigned to it. In particular, there are significant changes in priority setting, with the use of instruments that are either more 'top-down', or (purport to) erode research autonomy by greater sensitivity to societal concerns. It is only a superficial paradox that these changes correlate with a move away from a planning or command approach to policy. For there have also been changes in characteristic policy levers, notably in funding (more competitive, more conditional, etc.) and in evaluation (in particular, in most countries, a real 'evaluation system' has only recently emerged). These imply, among other things, both a greater integration of the private sector into the public research system and, at least on paper, enhanced control of the research system generally. The fashion for interdisciplinarity has, in many ways, similar effects, since it erodes established disciplinary boundaries and internal hierarchies, thereby facilitating, in principle, the policy steering process.

Third, **changes related to internationalization.** Traditionally, internationalization was neither a priority, nor a problem; when it was endorsed by researchers, policy-makers endorsed it as well. This has shifted, partly as a direct consequence of internationali-

zation, partly as a consequence of changes in the way internationalization is viewed by policy-makers. It can now be regarded as, in some respects, a policy lever.

The governance of and in science has gradually emerged into a new paradigm for research programming against the background of structural reforms outlined in the previous section. However, as already hinted at, **this new paradigm is not unproblematic**. The next two sections consider the implications of this paradigm for the definition of excellence and for the new institutional focus of research, namely, the network.

3.4 **Excellence in national and international contexts**

The definition of excellence in research is a contested issue and has been so almost always. The SEMMERING project focused on how the contemporary debate on excellence is influenced by the governance debate.

What stands out in particular is the **ever-increasing emphasis on the ‘usefulness’ or ‘policy relevance’ of research as the key defining element of excellence**. The boundaries between research that is policy-driven in comprising analysis for policy and research that is policy-relevant are becoming increasingly fuzzier. In the social sciences this is among else shown in the greater engagement of consultants in basic research, on the one hand, and of traditional research institutions in applied research, on the other hand.

The emphasis on the ‘usefulness’ of research has implications in two ways: first, with regard to the research agenda (at programme and project level) and, especially, how

this is or should be defined with reference to stakeholders or users; second, with regard to the industrial share in RTD funding.

The so-called societal demands on research are often intermediated to scientists by science policy-making institutions through calls for trans- or inter-disciplinary research, science communication or stakeholder involvement. The expectation for science to contribute to the public interest is not new. However, its conceptualization has changed. In the past, such a social contract was translated into a division of roles between government and scientists, with the former providing the necessary funding and conditions for the latter to be able to deliver the expected knowledge, inventions and contribution to the welfare of society. Under the conditions of such a contract, scientists retained autonomy over their work and social organization, with internal modes of accountability and social norms. In return, they were expected to provide the solutions for the future challenges of the nation. At present, scientists are expected to prove that they are contributing to this interest through elaborate science communications (or so-called dissemination / exploitation strategies), stakeholder involvement in the definition of research questions and the arrival at policy conclusions, and not least through specific operationalization of inter-disciplinary research towards so-called trans-disciplinarity understood as overcoming disciplinary boundaries rather than integrating disciplinary approaches. This shift is among else seen in the transformation of research councils away from self-government. Research councils are increasingly less run by scientists, the latter comprising one of several 'stakeholders' in the definition of research priorities.⁴

⁴ See among else, Tiago Santos Pereira 'New directions for the governance of science policy', presentation at the Seventh Semmering Forum, Warsaw, October 2002.

The emphasis on ‘usefulness’ accentuates the trend towards commissioned or contract research or of research that is organized around thematic calls for proposals and where projects are set out to last for a limited period of time. Among else, this is thought to increase the possibility to monitor research quality and relate research outputs to ongoing or pressing policy needs. Terms such as ‘dissemination’ or ‘exploitation’ are in this context of particular relevance. Similarly with the involvement of stakeholders in the definition of research questions and the assessment of research outputs. The emphasis on inter- and trans-disciplinarity must also be seen from this perspective. Inter-disciplinary endeavours are less appreciated for the possibilities they entail for advancing the state-of-the-art but more for the possibilities they are thought to entail for transcending boundaries and involving ‘users’ in the research process. Even though this trend is also valued as representing a process of democratization of research, it can also lead to the thinning out of research design.

In this connection, a key question to address is: what are the expectations of users and what are the possibilities of science and research to fulfil these expectations? Both the notion of ‘knowledge producers’ and that of ‘knowledge users’ are very broad – there are different modes and paradigms in different branches of science, as well as different groups of users in economy, policy and society. Industry-research interactions might differ from policy-research interactions with regard to both expectations and outputs. Given this, it is important to reflect on whether the notions of ‘dissemination’ and ‘awareness’ are indeed the right ones to be using. A better mutual understanding of possibilities of science and research, on the one hand, and of the users on the other, should indicate new pathways for realistic visions and concepts.

Research takes place in various arenas operating under different conditions. One major difference is between research taking place

at universities and at research centres, though there are also important differences between large national research centres that operate under a different framework than private ones. Private, non-profit associations and foundations must also be distinguished from consultancies. Aside from the structure of the different research organizations, the national framework also plays a significant role. Thus, for example, universities are major players in research activities in the UK, whereas in other countries research centres play a much more important role. Relevant to this is the problem of research funding – different funding opportunities create functional differentiation in the respective national environments and recent reforms will have a major impact on the functional distribution between the different research actors.

The category of ‘user’ is similarly diverse and often ambiguous when used generically as it applies to different social categories such as government, industry, academics or the general public. These social categories differ from one another in their social and contractual relationship to research. That is, across and within these categories, there are differences in expectations, thus requiring researchers to distinguish between different kinds of users, if those users’ expectations are to be met. Direct users of research results (e.g., commercial firms, executive departments of government commissioning work or recommendations to resolve a particular problem, etc.), and those who use research as part of a strategy towards achieving a wider aim (e.g. government promoting research to stimulate economic growth, or industry making use of collaborations for their networking or recruitment potential). These may be called short-range or long-range users of research, and they stand at opposite ends of a spectrum of user/researcher relationships.⁵

⁵ Norma Morris, ‘Defining and Constructing Users’, Presentation to the Eighth Semmering Forum, Brussels, November 2003.

The high level of dissatisfaction in the policy making community, based on perceived shortcomings in the way that researchers conduct their investigations and convey their findings, is set against the complaints of researchers about unreasonable demands placed upon them in relation to time, scope and practicality of their work. Research and science policy mechanisms have been developed to address these concerns, with most such initiatives adopting a linear model of knowledge transfer from researcher to research community. In relation to the transfer from the expert to the non-expert, the user and interested public, that linearity can also appear hierarchical, with knowledge passed down from the top. The results can consequently be damaging for all parties – users resent paying for and receiving output that has no new information and little use value, while researchers feel that their best efforts are denigrated and insights ignored. Both user and research communities are liable to feel dissatisfied and de-skilled, and antagonistic to the needs of the other.⁶

New approaches, meant to address these problems and enhance the collaboration of sets of actors who are in a symbiotic relationship as regards knowledge production, have emerged in the past few years. Most evident is the drive for evidence-based social science policy-making, and the concept of technology transfer to establish productive synergies between industry and researchers. Both of these initiatives have met with mixed success. The ongoing concerns of the social science policy-making community suggest that the currently dysfunctional relationship between users and researchers will continue. Current mechanisms – advertisement of expressions of interests, written submissions responding to tender documents, specified funding priorities and themes – do not require or encourage this essential

⁶ Ian Forbes, 'Translating Knowledge: User and Researcher Collaboration for Policy Relevance', Presentation at the Eighth Semmering Forum, Brussels, November 2003.

communication, and can serve to lock both communities into their own language and practices. The open market of competitive bidding is far from producing a double coincidence of wants.

The above should not be read as a call for dropping the idea that research can and should be useful to a wide range of knowledge users. There are good reasons why scientific research in earlier times was criticized for taking place in the context of an 'ivory tower' devoid of any links to the real world.⁷ However the conceptualization of 'usefulness' alone in the framework of a research project (i.e. limited time) and in a linear way (from user to researcher and back to user) is at best naïve and at worst dangerous for research quality.

The interest in the 'usefulness' of research is also linked to the greater emphasis on the role of industry for research, primarily as a source of income. Today, industrial interest in research is often a condition for getting state funding. More generally, this has in many ways supported the shift from core funding to commissioned or contract research on a project basis. Within and outside the universities we find today a new form of acquisition-oriented research centres which survive on many short- and middle-term overlapping research projects. A large part of the work of these centres is acquisition, co-operation, communication and evaluation of projects.

But the actual figures of private RTD investment are likely to be overestimated. In the natural sciences and engineering the existing figures of private RTD investment tend to overlook that most of the private RTD funding streams into the own company with only a very small share used to finance research outside, i.e. in universities or research organizations. In Germany, only one

⁷ See, among else, Tiago Santos Pereira 'Managing Research or Governing Research?' Presentation at the Eighth Semmering Forum, Brussels, November 2003.

seventh of these expenditures goes to state or state-affiliated institutions. The lion's share goes to other private sector companies or outside the country. Furthermore, the requirement that research organizations or companies commit 50 per cent of their own financing to research endeavours in order to obtain public funding – a common requirement for industrial research but also, in the meantime, of EC and nationally funded research and for the social sciences – has been only variably successful in mobilizing private investment into RTD. Aware of the difficulties in raising private or additional funds for research, German ministries allow industrial partners to report their own equity stake, e.g. through an inflated estimate of high overhead costs, so that many projects work in fact with much less money than indicated in the overall financing plan.⁸

If even such strict requirements as co-financing are not succeeding in mobilizing real private investment into research, it might be time to recognize that a large part of pre-competitive research – the type of research that after all the RTD framework programmes of the European Commission also purport to support – is not interesting for industry at this development stage. There are two options out of this dilemma. The first is to merely focus on that type of competitive research that is of interest to industry. This appears to have been the orientation of the Sixth Framework Programme in its early phases. However to do this also means, de facto, to drop any claim to scientific endeavour as of 'general' or 'public' interest and leave it to the market alone to drive intellectual entrepreneurship. Even if successful in the short-term, such a limited construction of knowledge is unlikely to bear any fruit in the long-term and will eventually undermine any innovation potential. The alternative and only real option is to move away from this

⁸ See, among others, Hans-Liudger Dienel 'Persuaded Industrial Interest in State Funded Research', Presentation at Seventh Semmering Forum, Warsaw, October 2002.

reductionist and one-sided view of knowledge and look for policies that recognize and do fairness to diversity.

3.5 Networking for excellence

Collaborative and comparative research tend today to be network-based. Experience of network-based research, especially from the perspective of funding agencies, is at best mixed. The network structure introduces a level of institutional uncertainty that makes delivery and performance less predictable and less easy to monitor than with more straightforward legal-scientific relationships. In addition, the reliance of networks on viable institutions encourages the various familiar forms of free riding, churning, and academic dilution.

Networking, far from being an antidote to bureaucracy – which is one standard justification for it, especially within general theoretical perspectives on ‘network society’ –, rather rearranges and redeploys it. Often ‘networking’, as proclaimed and practiced by funding or governmental agencies, represents a new form of bureaucratization from the perspective of the definition of research objectives and legitimacy. This can threaten both research autonomy and bottom-up, real-life networking as practised by researchers which is based on a web of inter-personal relations that constitute a project that may be collective if not actually shared.⁹

This is among else shown by the way the EC has been trying to ‘create’ the European Research Area (ERA), oblivious to the fact that this already exists, at least in a preliminary form. Undoubtedly,

⁹ See among else, Thierry Leterre, ‘Networks vs. Institutions’, Presentation at the Sixth Semmering Forum, Lille, December 2001.

the Framework Programme played a decisive role in making it sustainable, but it was not the only factor at work. The data suggest that it was built bottom-up, based upon ongoing scientific co-operation on the bilateral and multilateral levels among research communities as well as between research communities and industries. Those activities might have never led to fully developed research projects without the means allocated to the successfully bidding consortia. A relevant part of such consortia, however, were based upon networks which existed prior to the submission to and funding by the European Commission of one or more project proposals. There is certainly a need for stability and long-term planning to increase the quality of research.

There are two ways to stimulate such stability, the *bottom-up* oriented competitive way in which the Framework Programmes have operated up until now and the '*Eurostat model*' based upon a central European research 'factory' and national 'centres of excellence'. The latter way is that originally proposed by the Sixth Framework. For the reasons stated above it has to be rejected as both centralistic and as undermining rather than supporting research autonomy, collaboration and competition.¹⁰

Against the background of the previous discussion on the governance of science and the new definition of excellence, networks in research are today conceptualized as primarily operating at the project level, i.e. with reference to a specific set of research objectives, running for a certain period of time and aiming to develop a specific set of outputs that are 'useful' or relevant to specific set of policies. This is a rather restricted definition of a network which tends to shift attention away from the structural dimensions of a network, the human capital, technological capital and social capital dimensions. Interestingly,

¹⁰ See, among else, Ronald Pohoryles 'The new framework programme; a critical perspective', presentation at Sixth Semmering Forum, Lille, December 2001.

these dimensions are given much more attention in regional economics and in social capital analyses.¹¹

3.6 The Framework Programme and the social sciences

As already stated in the first section of this chapter, the Semmering Forums provided the opportunity to also discuss the ongoing developments with regard to the RTD Framework Programmes, especially as these apply to the social sciences.

Since the mid-1990s the European Union has supported collaborative policy-oriented research carried out by European social scientists through its Framework Programmes FP4 and FP5. A key objective of EU social science research policy was to achieve 'European added value', although the meaning and implications of this notion were neither precise nor well understood. From the perspective of the European Commission, bringing together social scientists in EU funded research projects was thought to add 'European value' (relative to other funding agencies) in at least three respects:

- projects brought together scholars from different countries to deal with social, economic and political issues whose relevance and importance transcended a single country (thus *transnationality*);
- partners frequently brought a range of disciplinary perspectives to the consortium and were expected to approach the topic

¹¹ See, for instance, Riccardo Cappellin, 'International Knowledge and Innovation Networks for European Integration, Cohesion and Enlargement', Presentation at Eight Semmering Forum, Brussels, November 2003.

under investigation from more than a single scholarly vantage point (thus *interdisciplinary*); and

- proposed projects were explicitly organized around themes and issues that the Commission had defined in advance and which addressed public policy issues of relevance to the European Union (thus *targeted, applied research*).

In 1994 when the EU Council of Ministers established the Fourth Framework Programme for Research, Technological Development and Demonstration (FP4), the main aim was to establish a common science and technology policy in Europe. In the area of the social sciences (which received a relatively minor portion of the overall 13 billion euro budget), the key policy instrument for achieving this goal was the Targeted Socio-Economic Research (TSER) programme. The aim of TSER was to build up a policy relevant knowledge base and facilitate research networks for high quality, comparative socio-economic research. TSER was implemented in three successive calls for proposals that resulted in the funding of a total of 162 projects. These social science projects fell into three main content groups – science and technology, education and training as well as social policy – and two funding types, namely research projects or thematic networks.

The Fifth Framework Programme (FP5) expanded the horizon, breadth and depth of the Commission's interest in social science research. The Key Action 'Improving the Socio-Economic Knowledge Base' was defined as the Commission's major policy instrument to mobilize social science researchers from different disciplines to contribute to solving key challenges facing Europe's economy, polity and society. These included, for example, improving the management of societal change, providing forward-looking policies concerning employment and unemployment, enhancing social cohesion, providing new perspectives on

learning, considering new forms of governance and citizenship, and dealing with EU enlargement. With a budget of 165 million euro, and by means of three calls for proposals, over 200 social science projects were funded under FP5.

Characteristic of both FP4 and FP5 was the Commission's support for comparative, multidisciplinary and targeted social science research in a bottom-up manner. Even though the research support was organized around thematic calls, these were comparatively open and the financial instruments available allowed for a wide range of activities ranging from small to bigger projects. Collaboration across national borders was an explicit aim but also recognized as happening independent of the programmes as such. The overall objective was to provide means to deepen this and, in doing so, increase both awareness and knowledge of the similarities and differences across Member States in various fields of policy relevance. The programmes were successful in precisely those terms. Surveys of researchers participating in these programmes showed that EU funding of social science research projects has meaningfully altered social science research in Europe: funding opportunities have increased; new research questions have been formulated; new social, economic and political contexts have been studied and compared; the methodological toolbox researchers utilize has been enriched; more scientific collaborations that transcend disciplinary boundaries have been conducted; research networks have been re-configured; researchers have found innovative ways to integrate user groups and stakeholders into their projects; and research findings have been disseminated and discussed in increasingly diverse formats.¹²

¹² Two independently carried out surveys confirm these findings. The first was carried out in the framework of the INNOCULT project (FP4) on the internationalization of research; the second in the framework of the FP5 accompanying measure 'European Dimension: Towards a European Research Arena'. The results of the former were reported by

With the onset of discussions for the Sixth Framework Programme a change in the policy narrative could be observed. The term 'European Research Area' (ERA) emerged on the agenda, albeit in a way that suggested that this did not exist and had to be created anew. This was not a mere rhetorical or public relations device. Rather it reflected a genuine conviction that what had been achieved by the previous framework programmes was not sufficient for creating excellence towards the European knowledge society. The reader is here reminded of the understanding of excellence under the new paradigm of the governance of science with regard to 'usefulness', on the one hand, and the mobilization of private funding, on the other hand, and in the context of structural S&T reform towards increasing the competitiveness of (and within) universities.

The answer to this 'problem' so defined was the introduction of the so-called 'new financial instruments', and specifically of 'integrated projects' (IP) and 'networks of excellence' (NoE) to mobilize research capacity, create critical mass and structure the research area. Both IP and NoE were conceptualized with 'size' (big) as their defining principle: it was thought that excellence as defined above could be better achieved through projects or thematic networks that would run for a longer period of time (five years instead of two or three), with more funds (5 million in EC contribution as opposed to between 0.5 and 1 million) and with bigger consortia (20-30 partners, especially for NoE). The parallel introduction of stricter financial guidelines implied, in addition, that these new big projects would primarily engage universities as public bodies or public equivalent or larger companies. In practice this implies discrimination vis-à-vis specific types of research organizations but also smaller countries or countries with research

Ronald Pohoryles at the Sixth Semmering Forum, the results of the latter by Aaron Benavot at the Eighth Semmering Forum.

structures and cultures that do not fit the 'standard' model implied by the Sixth Framework Programme.

Following the first call for proposals within the framework of FP6, it became evident that the difference between integrated projects and networks of excellence was actually quite small. Furthermore, the meaning of 'excellent' in social science is highly disputable and numerous scholars believe that it is actually not possible to standardize social science. 70 proposals were received for the first call under Priorities 5 and 7. According to the rule, 'the winner takes all', only five proposals had a chance to qualify for funding. In one research area, no proposal passed the threshold, i.e. there were only 4 'losers'. 14 proposals were above the very high threshold (80 points out of 100). With that, the success rate in the first call was extremely low (5,7 per cent or 4 out of 70). Even if a proposal passed the high threshold, it was considered average and thus had a very low chance of receiving funding.

The new instruments of FP6 are increasingly coming under attack in several fronts, including – and this is telling – from the industry as well as the research communities in the natural sciences and engineering. One key problem is the exceeding bureaucratization that is evident both in the contract negotiation procedures and, especially, the accounting principles for justifying RTD expenditures. However not less problematic is the underlying mentality of 'the winner takes it all' and overarching idea that excellent research can only be achieved in very specific institutional and organizational formats. Furthermore the increased budget of integrated projects or networks of excellence is often so only on paper and not in practice: the larger consortium basis means that individual partners often receive less funding than they did under the FP4 or FP5 yet are expected to produce more output. The result is overall one of 'thinning' of research capacity and quality rather than that of consolidation of research structures.

Given the actual heterogeneity within the real-existing European research area, trans-national research funding is a strategic task. Through the previous Framework Programmes, the European Commission had gained a high reputation as capable of dealing with diversity in research cultures. This is now endangered by the Sixth Framework Programme. This is also the conclusion that is reached by high-level group reports commissioned by the European Commission such as the Marimon and Sapir reports¹³ which, consequently, call for corrective action – in the mid-term with regard to the further implementation of the Sixth Framework Programme and in the long-term through the establishment of an autonomous agency for managing European research funding and programming. In the meantime the discussions regarding the Seventh Framework Programme are under way.

The development of the Sixth Framework Programme is probably the strongest empirical evidence that the paradigm that guides contemporary research programming is intrinsically at fault in many respects and for the reasons outlined in the previous section of this chapter.

¹³ Marimon Report: *Evaluation of the Effectiveness of the New Instruments of Framework Programme VI* (2004). Sapir Report: *An Agenda for A Growing Europe* (2004).

4 Conclusions and Policy Implications

What conclusions are to be drawn from the above findings? Let us first summarize our findings.

S&T reforms in New Member States, the NIS but also the EU-15 are often driven by misconceptions regarding the nature of the national innovation system, the role of research and higher education in this context, the interest of industry in research and how this translates (or not) into financial commitments, the role and meaning of internationalization and, more generally, the process of innovation itself. The intervention logic that underlies many of contemporary S&T reforms is based on the linear instrumentalist model of research – both knowledge production and the use of knowledge. However this model is not only outdated but empirically proven wrong – in the social sciences as much as in the natural sciences and engineering.

Many of the S&T reforms have as ultimate aim the reduction of direct state intervention in research and are carried out also in the name of research autonomy. The new paradigm of the governance of science emphasizes horizontal and open forms of collaboration and values competition. However, under this new paradigm, and in the context of financial pressures, research programming has assumed a stronger rather than lesser interventionist mode while at the same time withdrawing responsibility for the S&T system and its long-term development. Many of the economic incentives designed to increase industrial or generally private sector investment into RTD are producing meek results or only working in a limited set of fields that display a direct technological and economic relevance at present. Technological fields with a longer development phase as well as a range of basic research fields, including social sciences, are instead facing serious problems in terms of sustainable development. These

trends are aggravated by structural problems related to the supply of research personnel – there is here an issue of both brain waste (in fields that are not relevant for innovation and research) and brain drain (towards the U.S.). This is a direct result of the employment policy characteristic of the governance mode of science in the context of financial pressures and in conjunction with increasing bureaucratization. Contract research is celebrated as a means of promoting the usefulness of research but in fact it supports the emergence of a new form of research management that leaves little space for long-term human resource development.

The ‘usefulness’ of research is today the ultimate criterion for measuring excellence. There is hardly a research programme at either the European or national level that does not require that proposers consider research ‘dissemination’ and ‘exploitation’ in a continuous way while carrying out research and come up with ingenious ways for ensuring that their research is used and applied (that go beyond the ‘standard’ or ‘traditional’ method of organizing workshops, conferences, demonstration exercises, press releases etc.). The question of course becomes, what may such ‘new’ dissemination means entail. The truthful answer is that there are no dissemination means that can ensure the ‘a-ha’ effect on the part of potential research users. The framing of the problem as such is wrong to start with. Only in the exceptional case can research have a direct impact in the short-term. In the case of social sciences, when this happens – as occasionally in successful policy consulting – it is unlikely that what is referred to as ‘research’ also comprises ‘new research’. Ironically, this specific conceptualization of excellence as relating to ‘use’ is probably even less effective than the traditional framing of research excellence in terms of academic publications, the number of citations or the number of patents.

The application of the term 'usefulness' to also signify democratization in research is equally misleading. Involving stakeholders in research is no guarantee for democratization. This is not only because the category stakeholders is multiple and diverse. Involving stakeholders in research can also mean 'driving' research results in a specific way and this goes against both research autonomy and public accountability.

Finally, care is also required when using the term 'network' to describe research endeavours as well as designing policy in those terms. International research is today increasingly undertaken in the framework of networks and in the context of contract research. There are two problems with policy designed to support research networks. The first is that it assumes that such networks can be created by design with reference not only to a specific call theme but also in the framework of strict organizational rules regarding research management and funding. The second problem with contemporary policy in this regard is that for networks to be successful – even in the limited instrumental understanding of success – many other factors, largely contextual, have to be met. Trans-national networks are still dependent on the physical, infrastructural and social capital of the specific environments of their members.

These findings advocate a re-orientation of S&T policy reform, including of the research programming at European level:

S&T structural reform needs to be based on the real-existing structures for research and the public-private interface and not alone on their ideal representation by any specific model for innovation and S&T. Middle-range incentives to engage the industry and the private sector in the financing of research need to be combined with long-term continuous financing of research

structures by the state in the form of subsidies as well as increased investment into education at all levels.

With respect to the evaluation procedures there is no doubt that the European research policies have had a major impact in establishing the awareness for the need of an evaluation culture across Europe. However, the actual procedures need to be revised in the light of past experiences. On the whole, evaluation procedures on the European level have not changed in a significant way during the past Framework Programmes. The procedures are quite inflexible and tend to favour mainstream projects rather than scientific excellence. Furthermore, even for cases of clear mis-judgements on the side of the evaluators there are no procedures to appeal against these errors. The quality of the evaluations has not just increasingly faced criticisms from the research communities, but from high-level expert groups as well (cf. Marimon 2004).

Statistical frameworks for measuring RTD investment need to be revised in order to adequately measure the sources of income for research as well as its forms of expenditures. Financial accounting frameworks at the institutional, programme and project level need to move away from rigid rules and make provisions that allow long-term human resource development.

European research systems must finally recognize that the promotion of competitiveness within research does not presuppose that all research positions are short-term and bound to specific research contracts. There is a need for employment policies in the research sector that balance short- and long-term objectives and ensure that research capacity is built bottom-up at the level of individual research careers.

Research programming needs to recognize that there is no 'one size fits all' approach to support research collaboration and research excellence. Clinging on a narrow definition of research excellence and networking around the linear model of the use of research results undermines research autonomy and also misses the objective of producing knowledge that is relevant for policy in the broader societal sense.

Diversity – in research cultures, approach and organizational formats – is a pre-condition for the creation of a rich research base and critical mass. Research policies must orient themselves to this structural prerequisite rather than undermine it.

The research community must be integrated in the process of research programming. It is important that research councils or equivalent bodies at European or national level follow the 'self-management' principle rather than shift responsibility to a bureaucratic administration that is dis-embedded from the research process.

5 Dissemination and/or Exploitation of Results

As an accompanying measure conceptualized as a thematic network, the SEMMERING project was by mission a dissemination project. The three conferences organized by the project brought together researchers and S&T policy-makers from different countries and government levels to learn about research and research policy developments and deliberate ways to advance the policy and political agenda towards the growth and consolidation of an already-existing European research area.

In order to better communicate its message, the SEMMERING project undertook in addition the following:

A project Web Site was established at the beginning of the project. This Web Site was used to inform about the projects and its activities. The Web Site will remain active also past the contractual end of the project. All project deliverables can be downloaded from this site at www.iccr-international.org/semmering.

A brochure outlining the project's goals and activities was published at the beginning of the project and distributed at the conferences as well as by the project partners at various other external events.

Several article publications or conference presentations have been used to disseminate the project's findings to a wider audience:

- Special issue of the *International Social Science Journal* (editor: John Crowley) on subject of 'Excellence in Social Science', No. 180, June 2004 and including contributions made to the SEMMERING Forums.
- The theoretical background of the project as it informed the SEMMERING network proposal was published as a special issue of *Innovation; the European Journal of Social Science Research* (Vol. 15, No. 4, 2002) (editor: Ronald Pohoryles)

(with B. van der Meulen as guest editor). Articles subsequently published in Innovation were based on contributions to the SEMMERING network and related activities.

- Ronald J Pohoryles (2003), 'Towards monopolisation and re-nationalisation of European social science research?' *International Social Science Journal*, No. 177, September 2003.
- Tadeusz Żółtowski (2003), 'Role of Polish Science in context of Lisbon Strategy' in *Challenges of Community Innovation Policy* published by Polish Economic Society (Publications), Cracow.
- Tadeusz Żółtowski, 'Lisbon Strategy – the Role of Science, Technological Development and Informatiation', in *Organizacja i Zarządzanie* (Organization and Management), forthcoming
- Presentation of the SEMMERING Results at an ESRC sponsored workshop in London, March 10-12 2003 (Ronald Pohoryles)
- Presentation of the SEMMERING Results at an CIR sponsored workshop in London, April 2 2003 (Ronald Pohoryles)
- Presentation of the SEMMERING Results at an EUI-Natolin sponsored workshop in Warsaw, September 4-6, 2003 (Ronald Pohoryles)
- Presentation of the SEMMERING Results at the conference 'How to achieve European Added Values?', Brussels, October 9-10 2003 (Ronald Pohoryles)
- Presentation of the project at the conference 'Foundations for Europe: Science and the Citizen' organised by the European Foundation Centre in April 2002 in Brussels.
- Presentation of the project at workshop 'Scenarios for Research Policies in the candidate countries in view of the

ERA', Seminar, organized by DG Research in October 2002 in Budapest.

The partners of the project have in various constellations – also including participants to the conferences or members of the Steering Group – been using the project results to prepare research proposals for follow-up RTD projects or conference activities. Among else it is hoped that it will be possible to build on the project results to continue the tradition established by the 'Semmering Forum' and return with the Ninth Semmering Forum in 2005.

6 Acknowledgements

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This document has been produced in the framework of the SEMMERING project. The authors are solely responsible for the information in this document. The European Community is in no way responsible or liable for the contents of this document or the use made of it.

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7 Annexes

7.1 Deliverables

Deliverable 1

Changing Patterns of Science and Research: New Policies for New Challenges

Main Partner in Charge: CIR

November 2002

Deliverable 2

Evaluation of Research and Research Policies

Main Partner in Charge: CIMPAN

September 2003

Deliverable 3

Towards New Collaboration Cultures

Main Partner in Charge: ICCR

August 2004

Deliverable 4

Inputs for the Development of Innovative Research Policies

Main Partner in Charge: ICCR

October 2004

7.2 Contact person

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