Chapter 4.

Analysing public policies for research and innovation: adding value with Europe

Jim Dratwa[1]

4.1. Introduction

"Unity in diversity", such is the motto – and the predicament – of the European polity. This takes on a particular saliency for policy analysis considering the European Union (EU) action in the field of scientific and technological research and development. To start with, the evolving roles and forms of the State(s), the products and processes thereof, as well as the interplay between the different levels and actors are the gist of political science. What is more, integration, cohesion, and community are at the heart of the EU project and narrative. Now as regards research policy more specifically, for over twenty years its most visible – and financially largest – vehicle has been the Framework Programme, funding collaborative projects throughout the Community and far beyond, as well as infrastructures, individual fellowships, etc drawing in all actors of the research and innovation (R&I) processes. Further, in the last few years[2] the notion of European Research Area has emerged as a mobilising project. In addition, we will see that here too the relation between the parts and the wholes is center stage, a crucial entry-point to unpack knowledge and innovation processes in Europe.

This analysis is premised on taking "analysis" seriously, as an investigation of the component parts of a whole and their relations in making up the whole, i.e. the European R&I system, and as an exploration of underlying motives.

[1] The views expressed are purely those of the writer and may not be in any circumstances regarded as stating an official position of the European Commission.

[2] This project can be traced back several decades however. For an overview of its genealogy, see André (2006).

Firstly, it does so by scrutinizing the concept of fragmentation as an entranceway both to EU research policy and to the conundrums of Europe's R&I system.

This leads, secondly, to a diagnostic overview of the ailments of the European R&I landscape – keeping in full view the issue of vertical and horizontal coordination – which culminates with the importance of citizens / consumers/users and of demand-side policies.

Finally, probing European Added Value as a tentative obverse of fragmentation, it closes with a double plea.

1. For the adoption of (possibly common) evaluation methodologies, which take into consideration the policies at play at all levels (community / international, national, regional).
2. For the mainstreaming of research – or knowledge triangle – policy objectives beyond the confines of research ministries alone; indeed for a slightly different way to devise public action.

4.2. The part and the whole

The crucial relation between diversity and unity, the parts and the wholes, and indeed the profound respect for the former melded with a vocational drive towards the latter, are well encapsulated in the concept of *fragmentation* and its central position in the ongoing debates on European R&I policy.

What is the problem? What is the objective? What is the proposed action? And how solidly are those three elements connected? Is public intervention justified? Ought it to be taken at community – that is at EU – level, or rather at a regional, national, or intergovernmental level? Those introductory questions are a *sine qua non* in the development of every community policy. And it would seem that the concept of fragmentation in research bridges the gap between the first and the last of those questions. The first, as fragmentation would be the problem, the thorn in the flesh of Europe's R&I. The last, as that problem constitutes in and of itself a call upon intervention at EU level, since it is that said whole which is fragmented (and which is invoked and instituted *as a preexisting whole* by the very notion of fragmentation).

At this stage we cannot proceed with our inquiry without scrutinizing in some detail the components and implications of "fragmentation". Firstly, it should be noted that it is a notion with several dimension:

- fragmentation of research spending / funding / investment,
- fragmentation of research execution,
- fragmentation between member states, between regions,
- fragmentation between (scientific, technological, industrial) sectors,

» fragmentation between types of actors (e.g. universities, SMEs etc.),
» fragmentation between individual actors.

The above dimensions are often considered only in terms of investment / execution fragmentation. Yet the notion also extends to fragmented vision, evaluation, programming, policy, instruments.

Furthermore, the framework conditions and regulatory environment – for research, education, innovation, and commercialisation – are also subject to fragmentation.

Ultimately, the single market (for knowledge, but also in the classical fourfold perspective) is far from full realisation, and the demand (be it from the consumer base, through public procurement etc.) is naturally fragmented over diverse local markets.

The ceaseless transformations of polities such as nation-states combine diverse dynamics including sub-national *fragmentation* as well as *consolidations* extending beyond the state such as with regional integration processes. So do the transformations of R&I. Indeed the essence of R&I is the creation or elicitation of new questions, answers, facts, products, processes, fields, bodies, avenues, opportunities, and actors.

Public intervention (public policy, public action) as such is fragmented, and so is "knowledge and innovation" policy. It is fragmented very diversely along a combination of two dimensions. Vertically, i.e. across the layers of our multi-level governance systems (often reduced to a two-level game or, only marginally less crudely, to a clear set of four levels: regional, national, community, and (wider) international). Horizontally, across policy areas, issue-frameworks, and indeed across the institutionalised divides between ministries, departments, or international organisations. Those two facets will be pursued throughout this paper, and indeed the following section will be devoted to the former, while the subsequent section will pertain to the latter.

* * *

Before moving on, however, a number of questions for analysis already arise on that basis, chief among which is the following: What is the optimal level of fragmentation with regard to the above dimensions? A necessary step in addressing this is to consider the possible beneficial impacts of fragmentation as well as the possible detrimental impacts of fragmentation. An attempt at embracing them in their variety is proposed here. On the one hand, the arguments in favour of fragmentation:

» diversity of approaches;
» competition / emulation;

- rich and diversified R&I ecosystem;
- regional embeddedness;
- resiliency of the European R&I system;
- widespread absorptive capacity in regard to spillovers.

On the other hand, the arguments in favour of reducing fragmentation:

- addressing unnecessary duplication (but how to know whether it is unnecessary), i.e. misallocation of resources; reducing administrative and transaction costs;
- enhancing visibility, saliency, leadership, driving force of Europe / European research / European research policy;
- on that basis, enhanced role of research in Europe's external relations;
- addressing sub-critical mass.

As to that last point, in turn, a set of arguments as to why critical mass is desirable can be advanced:

- in view of the increasing costs of research in certain sectors,
- for competitiveness at the international level,
- for attractiveness at the international level; for economies of scale and of scope.[3]

It is also useful, when considering fragmentation and its detrimental impacts, to point to a set of cognate issues. In particular: What are the (alternative) means to address the detrimental impacts of fragmentation? Here a range of options is available:

1. research policy coordination (common visions, common programming etc.);
2. mutual exchange of information on ongoing and planned research activities;
3. mutual opening of national programmes;
4. increasing (the share of) EU-funded collaborative research;
5. developing national / regional specialisations with attention to synergies and complementarity (division of labour versus Saint-Matthew effect);
6. networking or reducing the number of funding bodies;
7. networking or reducing the number of research funding beneficiaries;

[3] All these arguments can be considered with the operational questions of

1. how to measure and compare the above factors so as to specify an optimal profile of fragmentation (cf. existing and yet-to-be-developed indicators, targeted studies etc.) and
2. what forms of public intervention are best suited to bring it about.

Besides, it should be noted that there is a dearth of research as to the combined conditions of validity of these elements. For example, despite a historical proclivity for "bigger is better" as regards project size in the public funding of research, there is no evidence to indicate that economies of scale and scope can in fact be achieved across the board in all sectors.

8. concentration of research activities on a smaller set of priorities / areas;
9. improving framework conditions and regulatory environment (including as to researchers careers, IPR, tax incentives etc.).[4]

Yet fragmentation, however under-researched, central, and promising, is only a small part of the problem with which Europe is faced as regards R&I. In fact, leaving aside the much-rehearsed ailment of insufficient investment in R&I, our diagnostic of the European R&I system – our endeavour of "analysis" – must highlight three overarching problems:

1. vertical policy coordination;
2. horizontal policy coordination;
3. and the place of the citizens/consumers/users.

Three ailments, which are all three *mereological* in nature (i.e. pertaining to the relations between the parts and the wholes, to the tension between unity and diversity). We will come to them in that order below.

4.3. The vertical dimension

Against the background of limited resources for public investment in research, it has become even more important to ensure that scarce funds are spent as effectively as possible. However, the already negative effects of Europe's relatively low investment in research are compounded by a number of structural deficits inherent in the European R&I system, which make Europe a less attractive place for research investors and researchers.

At the heart of the problem is the issue of vertical policy coordination in Europe. In particular, the question arises of how best to allocate policy competences and resources across the different organisational levels of public authority – local / regional, national and EU. As will be seen, the answer to this is complex. Most policy makers accept that there are arguments for intervening at all of these levels, which leads to a further consideration: the need to ensure mutual consistency of policies across these various levels of governance. We will return to this from a different perspective in section 4.6, through the concept of European added value.

In the EU, there has been an increasing awareness of the need to organize the multi-level governance systems for research better, in order to ensure greater

[4] It should be remarked that the detrimental impacts of fragmentation are also 'addressed', in a different sense, by the thriving of a service industry (advisory services, etc) which lives off it and helps the other R&I actors to make the most of it or get by despite it.

complementarity of policies, to reduce fragmentation of funding and to avoid duplication of efforts. The debate on the development of a full-fledged European Research Area emerged from this growing perception of the need for better multi-level policy coordination in the EU.

While national policy remains the basis of European S&T policy, over the past twenty years a dual trend of regionalization and Europeanization of research policies can be detected. On the one hand, there has been a heightened recognition of the importance of developing policies at the local/regional level. Innovation-related actions have been popular because of the role of geographical proximity when it comes to spillovers and knowledge transfers. The success of areas like Silicon Valley and Cambridge have helped to convince governments of the need to create more of these innovative knowledge clusters. Everyone wants their R&I 'hot-spots' these days.

On the other hand, there has been a significant growth in the scale and scope of EU level intervention. Since the 1st Framework Programme in the early 1980s, European research policy has expanded in terms of its ambition and its budget. The objectives of EU research have progressively widened to encompass socio-economic goals such as improving competitiveness and employment, and more recently the re-structuring of the European research system.

However, despite these important developments, R&I policies continue to be pursued largely in parallel streams at national, EU and regional levels – leading to what some have called a 'governance gap' of poor integration and coordination between these different levels (Kuhlmann and Edler, 2006). The division of responsibilities between these interdependent political layers is still evolving, but it is clear that there needs to be a better articulation and coordination between the different levels of governance. The *European Research Area* initiative was launched in 2000 to try and tackle these issues, and is now undergoing an unprecedented boom. Despite the progress doubtlessly achieved to date, however, it cannot be claimed that there is a fully integrated European R&I policy.

Unlike the U.S. or Japan, European research still represents a jigsaw of national public systems. National activities, governed by over 27 varying legislative, regulatory, and financial structures, are still largely undertaken independently of one another. This governance gap leads to a series of further weaknesses in the European research system (the fragmentation of research efforts, the unattractiveness of Europe to R&D investment from abroad and to foreign researchers, and uncompetitive framework conditions in Europe for carrying out research) (Muldur *et al.*, 2006).

What is more, these difficulties attached to a governance gap regarding 'vertical' policy coordination are further compounded by another problem: that of ('horizontal') coordination across policy areas.

4.4. The horizontal dimension

Despite widespread acceptance that research is embedded in a wider system, policies tend to continue to be formulated in a rather segmented fashion. Indeed authors such as Luke Georghiou, Philippe Laredo, and Stefan Kuhlmann have repeatedly called attention to the linearity of the paradigm still underpinning European research policy.

There is a need for closer coordination of research policy with other knowledge triangle policies, i.e. with education and innovation policy. In the latter's case this is hampered, however, by the institutionalised separation between research policy and innovation policy, which exists at EU level[5] but also in many EU Member States.

Furthermore, there is a need for improved *wider* horizontal policy coordination beyond the knowledge triangle. Coherence and impact would be improved by better links between research policy and other community policies such as market policy, competition, employment, environment, health, energy policy etc. To be effective, the European Research Area cannot be the precinct of research policy alone. The vision has to be shared if coherent actions are sought. Research policy on its own is of limited purchase. Indeed its impact largely depends on the extent to which other complementary policies are being pursued in conjunction. Some illustrations are useful to sustain this key matter. For example, simply boosting investment in R&D will not suffice to raise Europe's economic growth rate, increase its competitiveness, or create jobs if it is not combined with macro-economic stability and with horizontal coordination among structural policies. For example, raising Europe's expenditure on research can only be successful if more trained scientists and engineers become available through a targeted education policy, otherwise the result might simply be an increase in researchers' salaries. Similarly, the system should provide more opportunities for new entrants, greater mobility of employees within and across firms, and more retraining. Policies also need to be developed for attracting the best students and skilled workers from abroad, which will depend upon initiatives in migration policy. Taxation policies can be employed as well in order to stimulate research investment, while competition policies can help to drive down the costs of technologies.

This systemic policy view also underpins the conception of the Lisbon process which set the goal for the EU to become the most competitive knowledge-based economy in the world by 2010, to create more and better jobs and to achieve sustainable growth and social cohesion. The Lisbon strategy was based

[5] Despite this fact, and despite the recent multiplication of EU initiatives and funding schemes, the history of community R&I policy is marked by the move away from the initial fragmentation and dispersion more than 20 years ago towards a better-integrated "Framework Programme".

on the understanding that these goals could only be attained by launching a coherent and coordinated set of policy initiatives across a number of different fields – fiscal, macro-economic, employment, environment, innovation, education and training, and of course, at its core, research.

Notwithstanding the problems the EU has encountered so far in implementing this ambitious agenda, Lisbon was a milestone for two reasons.

1. Firstly, it set research at the heart of a European policy for achieving growth, employment and other key societal objectives, and thus acknowledged the central role, which will be played by knowledge in the economy and society of the future.
2. Secondly, and crucially, Lisbon recognized that while research was an essential pillar of EU strategy, it could only be effective if it was coordinated closely with a range of other complementary policies.[6]

In 2005, half-way to the deadline for the achievement Lisbon strategy, the Commission looked at the progress achieved so far. A report by an external expert group – the 'Kok report' (2004) – contributing to this mid-term review painted a gloomy picture: it blamed slow progress on an overloaded agenda, poor coordination and conflicting priorities. In particular, the report emphasized that

> *policies pulling in contradictory directions must be realigned so that instead they are mutually reinforcing* (Kok report, 2004).

These problems were addressed by the Commission in the Renewed Lisbon Strategy launched in 2005 (European Commission, 2005).

Such difficulties as those encountered in implementing the Lisbon Strategy reflect a widespread problem associated with managing multiple-policy agendas. Coordinating research policy with the multitude of other complementary policies poses a real problem for governments and public authorities across the globe. A recent OECD (2005) level study concluded that the increasing need for more coherent innovation policy agendas spanning ministerial boundaries and including many other policy areas creates deep tensions, which will have to be tackled, and pointed to the need for better governance systems to deal with these issues.

Part of the problem is that the inter-linked system, which policy makers are trying to influence is enormously complex, and there is no 'unifying theory' of public policy to provide precise guidance about how best to go about it. The

[6] Lisbon can also be seen as a patchy compromise, an awkward package-deal, emphasising where to get to rather than how to get there, particularly lacking as to Member States buy-in and 'responsibilisation' – and which happened to be concocted at the height of the hype and hubris which adorned the rim of the internet bubble just before it burst. That is not unrelated to the place of research therein. See Muldur *et al*. (2006).

multi-pronged policy approach adopted by more and more countries is a reflection of the increasing complexity of the challenges facing modern society, and consequently of the solutions necessary to meet them. It is also the result of a more refined understanding of the systems and processes that policies are seeking to influence. This is notably the case for research and innovation policies, which have evolved in recent years against the background of a more nuanced view of national and regional innovation systems, which emphasizes the role of institutions, linkages, geography and systemic failures as underlying rationales for government intervention (see for example Lundvall, 1992).

Of course, there are also institutional problems. Different policy areas come under the responsibility of different ministries or public authorities, which leads to the classic problems of institutional coordination. Policy makers are also called upon to 'square the circle' of various, often competing, interest groups such as businesses, employees, trade unions, the public sector, the elderly, city dwellers, home owners, the unemployed, and so on. Meanwhile, the objectives of different policy areas may prove challenging to reconcile with each other: for example achieving growth while protecting the environment, or maintaining budgetary stability while boosting public investment in education and research.

Tensions can arise too from differences in emphasis among various lines of policy. Typically, this is reflected in the regular budgetary conflicts between 'competing' policy areas. At EU level, this was apparent during the debate on the Financial Perspectives for 2007-2013, when policy fields jostled for position, and the rift was exposed between those favouring a continuation of the Common Agricultural Policy and those preferring a re-balancing of the budget towards policies for the knowledge economy. At national level too tough decisions have to be taken, and the difficulties encountered by Member States in raising their public spending on R&D point towards the inherent problems of shifting finances from other important policy areas.

Such differences often reflect competing models or frameworks used by policy players to view economic and societal change. There are those who are convinced that the main emphasis for policy in Europe must be on macro-economic stability, deregulation and labour market reform. Others stress more the role to be played by structural policies such as R&D, innovation and education in moving Europe towards the knowledge economy. Others still stress sustainable development as the golden standard. While such approaches are not mutually exclusive, it is important to appreciate that policy coordination does not always take place in a setting of shared understanding and vision (see e.g. Dratwa, 2004; Remøe, 2005).

If the EU is to develop effective policies for research and innovation in the future, there might well need to be an improvement in the systems of governance to promote more coordinated and joined-up policymaking and implementation.

Most countries have a complex set of institutions and arrangements with their own historical rationales. In an increasingly dynamic and inter-linked policy setting, governments are finding that these governance structures need to be renewed to avoid gaps and duplications and to enhance policy delivery. This is especially true for research and innovation policies, which are transversal and systemic in nature. Moreover, when it comes to policy at EU level in particular, there is another layer of complexity since its ambitious targets require coordination not only across different policy areas, but also, as seen in the previous section, between different levels of governance.

4.5. The people of the knowledge society

There is another fundamental matter in Europe as regards research and innovation: *people*. This touches on the researchers and students and designers and all the actors of the R&I processes, of course, but also genuinely here on the place of every citizen / consumer / user, of every one in society. The present section will comprise three developments. First, it probes the mutual shaping of S&T (sciences and technologies) and society. Second, it asks why it matters what the public thinks – and it answers. Third, it closes on a reconsideration of users as shapers of R&I and on a revaluation of demand-side policies.

4.5.1 The mutual shaping of society and S&T

The examples throughout this edited volume show how profoundly our culture is marked by S&T developments. At the same time as S&T shape our society, they are themselves produced, taken up, reconfigured, and shaped by society. That is one (double) way in which culture is decidedly scientific culture, and thus in which S&T are at the heart of this nearly eponymic 'Knowledge Society'. Nevertheless, to allow all sections of society to benefit from those advances – as well as to take part in that shaping process – individuals need to be provided with the appropriate equipment, in terms of education, skills, awareness, and appreciation for the stakes in S&T endeavours. Vital for a democratic society currently, such demands point towards another crucial sense for scientific culture, also exposing the acute need for it to be developed. Actions to foster a thorough public grasp of what is science and how it contributes to society are thus *sine qua non* to a fully fledged democratic society.

Importantly, S&T developments accompany and affect lifestyle changes in societies. In this respect, the taking up of mobile phones or GSM provides interesting illustrations (Zongo, 2001; Sanga, 2000). The GSM has strikingly changed the way people communicate with their loved ones, organize their work

and outings, and live everyday. As regards research, innovation, and competitiveness, the rise of the GSM standard provides an inspiring example of European leadership.[7] In effect, new information and communication technologies open up opportunities for new lifestyles and new ways of working (European Foundation…, 2004). Remote working or online trading decouples economic activity from a particular geographic location (be it the office, capital cities or structurally favoured regions). Moreover, such technologies can facilitate access to employment – and other forms of social inclusion / participation (e-GSSU, 2004; Centeno *et al.*, 2004) – among sections of society (people with physical disabilities, the elderly) who may otherwise be excluded. Key to achieving those benefits is ensuring that people are equipped with the necessary skills to get involved. Much information society literature (European Commission, 2004) also hypothesises that 'eWork' (remote working) may contribute to environmental sustainability as, in addition to other dematerialisations, travelling to work is reduced. On the other hand, transport technologies themselves – from the wheel through to the airplane – continue to have a central role in society, e.g. in enabling communication. It is S&T, which make possible the novel lifestyles – and indeed the novel society – discussed above.

It may be that, in solving some age-old problems, S&T has created the possibility for new problems to emerge. Yet even to address these new problems we can hardly do without S&T. But we can – and rightfully do – concern ourselves with the consequences of the solutions we devise.

Surely the emerging knowledge society will have its problems too. Crucially, it will not depend solely on S&T, but also on governance and on the citizens who will make up our society – and shape it. Yet it is characterized by an increasingly pivotal role for S&T. The knowledge society requires a revolution in our understanding of knowledge: not only with regard to S&T researchers, but also concerning a democratisation or broadening of knowledge production (Dratwa, 2002). This has profound implications for decision making, for the lay-expert divide, for the handling of risks and uncertainties, and indeed for R&I processes as well as for the relations between citizens and institutions of governance, as every individual should be recognized as – and given the means to be – a *person of knowledge*.

[7] It is thanks to the political determination of the EU that this unassuming technical standard – in fact this far-reaching technical and commercial and political endeavour – was brought to fruition. GSM now stands for 'Global System for Mobile Communications', it originates in the acronym for the '*Groupe Spécial Mobile*' hosted by the European Conference of Postal and Telecommunications Administrations, and its specifications where defined by the European Telecommunications Standards Institute in the late 1980s. Commercial operation began – and the world's first GSM phone call was made – in 1991 with Radiolinja in Finland.

4.5.2. For research policy, why does it matter what the public thinks?

Such is thus this most fundamental question, which we committed to answer (if not to exhaust). Why does it matter what the public thinks?

Firstly, we should draw on the developments above. Research makes up a substantial component of public intervention and indeed of government spending – at EU as well as national level – so it is a matter of course that all sections of the public should be on board. Furthermore, even besides the role of public authorities in this regard, S&T are an integral part of daily life as well as at the heart of the most salient and persistent societal issues of the day.

Secondly, to make the issue immediately clear in the perspective of a chapter on the ailments of Europe's R&I system, genetically modified organisms and stem cells are examples where public distrust can be seen as a weakness affecting European R&I performance, and thus its growth and competitiveness. However, that might be too simplistic a cut. Notably because the weakness might just as well consist in construing public recalcitrance as a failure, or in neglecting more sophisticated avenues of research and growth which can take the public – with all its wants and concerns – on board.

Thirdly and finally for now, the overarching issue: S&T are at the heart of the democratic state. In effect, S&T are at the heart of the notion of *legitimacy* as the relation between the public and the state. This powerful finding – dating back to Max Weber and even Aristotle – has been compellingly documented in the work of James C. Scott (1998) as well as Yaron Ezrahi (1990). His is a characterization of the democratic state as ceaselessly seeking to legitimate itself through scientific and technological performances (e.g. large-scale projects, 'modernisations', institutionalisation of scientific expert advice).

4.5.3. Demanding people

The importance of the interplay – mutual shaping or concurrent production – between society and S&T is increasingly well recognized. And so is the importance of the role of citizens / consumers / users in "knowledge and innovation" processes: in the democratic State, in research policy, in technology assessment (albeit not similarly in risk assessment), but also in the making of commercially and societally viable innovations. Their role is key in the policy process but also in the R&I process. And these two increasingly vital realizations – however tempting to ignore (anew) – meet in a novel approach to and emphasis on demand-side policies.

Yes, it may be that in solving some age-old problems S&T has created the possibility for new problems to emerge. Yet even to address these new problems we can hardly do without S&T. However, we can – and rightfully do – concern

ourselves with the consequences of the solutions we devise. It is possible to draw lessons – and strength – from successes as well as from setbacks. Notably if one, can henceforth open and pursue avenues of research, which take the public, with all its wants and concerns, on board. Could that be why Europe is at the leading edge in environmental technologies, transport technologies, and some areas of biotechnologies?

But the picture is neither uniform nor rosy. Community research policy – including the European Research Area – was built essentially on the Schumpeterian model of industrial research in an industrial economy. Perhaps as a result, its actions do not take adequate account of the massive expansion of the services economy, and of new kinds of user-driven, non-industrial, trial and error research. It is ill prepared to support the emerging generation of innovation, not merely as goods (such as the 'car' product and its production process) but as complex services (such as 'mobility' including car – and other transportation – availability, servicing, paperwork-management, replacement, alternatives etc.) which are user-centered. It has traditionally favoured supply-side policies. Now the time has come to find a better balance and make strides on the demand-side (notably as regards lead markets, user / consumer drive, bottom of the pyramid innovation reaching mass markets outside Europe too, public procurement, innovation climate) so as to boost the nexus between research, innovation, and growth – paying heed to the matters above.

4.6. Conclusions and further perspectives: adding value for Europe

Is EU R&I policy any good? Any evaluation, just like any ex-ante Impact Assessment (i.e. the assessment of the impacts of community policies, of their added value; a core instrument of the community's Better Regulation initiative), can only be fully accomplished – can only fulfil its potential, can only fully make sense – if it is carried out in reference to the impact and value of non-community policies. It is a comparative exercise and it therefore requires points of comparison. That is the operational meaning of the phrase "European added value": in order to establish what community intervention adds, it is indispensable to establish what it adds *to*. Indeed a key criterion in evaluating community policy intervention is that of added value. This criterion is closely associated to the *principle of subsidiary* which stipulates that the European Union shall act only

> *if and insofar as the objectives of the proposed action cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale or effects of the proposed action, be better achieved by the Community*.[8]

From the outset, the endeavour of evaluating research policy (and programmes, and projects) and the notion of European added value were closely intertwined.[9] With the rise of Better Regulation and Impact Assessment, European added value rose to a new political importance in the run-up to the adoption of the 7th Framework Programme, in the context of the Financial Perspectives 2007-2013 debate, and with the renewed European Research Area impetus.

As discussed above, European integration in the field of research is a set of processes and policy measures aimed at moving towards a less fragmented system of research in Europe. This means implementing policies to go beyond the 27 different national systems towards a more coordinated and effective research system. Over the past twenty years, the integration of research systems in Europe has assumed an increasingly high profile. The importance of the Framework Programme has grown, and arguments in favour of a more coordinated EU research system have been voiced with greater frequency and insistence. A number of guiding principles have driven this trend, based mainly upon the notion of European added value:[10]

---

[8] Subsidiarity was introduced into the Treaties in 1992 by the Maastricht Treaty, in Article 2 of the Treaty on European Union (TEU) and Article 5 of the Treaty establishing the European Community (TEC), quoted here. With Amsterdam, 5 years later, a *Protocol on the application of the principles of subsidiarity and proportionality* was annexed to the TEC. Subsidiarity was to be embraced prominently in Article 9 of the Constitutional Treaty to be.

[9] There is in fact an oft-rehearsed conflation, in discussions and studies about European added value, between project (or proposal) level, programme level, policy level, and overarching orientations level.

[10] Predating the 'Reisenhuber criteria' established in the mid-1980s at the time of the First Framework Programme, the notion of *additionality* occupies a major role in the conceptual genealogy of European added value – continuing to structure it today. As per its origins in community cohesion/regional policy in the 1970s, the 'additionality principle' meant that structural fund expenditure must be additional to – and not substitute for – what would otherwise have been incurred by the relevant national or local public authorities for a given initiative or area of activity. Bringing it to the R&I field and to the present day, it is useful to distinguish three types of additionality. *Input additionality* refers to funding inducing an activity which would not have been carried out (i.e. by the private sector, or by relevant national or local public authorities, as the case may be) in the absence of that support; it is about pooling resources. *Process* or *behavioural additionality* refers to funding affecting the way an activity is performed – the behaviour of the actors of the R&I process – compared to the way it would have been performed in the absence of that support. *Output additionality* refers to funding inducing results which would not have been achieved in the absence of that support; it is about pooling results and achieving greater impacts.

- *Critical mass.* Some research activities are of such a scale and complexity that no single Member State can provide the necessary financial or personnel resources, and hence need to be carried out at an EU level in order to achieve the required "critical mass". This occurs where a large research capacity is needed and resources must be pooled to be effective, or where there is a strong requirement for complementary knowledge and skills (e.g. in highly inter-disciplinary fields). Economies of scale and scope seem increasingly important in certain sectors given the rising costs of carrying out R&D.
- *Big science.* By their nature, some scientific undertakings involve massive investment (e.g. large research installations, databases). Since the construction and operating costs of such facilities are high, it is inefficient for countries to duplicate these investments. EU intervention is justified in terms of providing support for transnational access to large-scale facilities, for the development of new instruments and equipment and for cooperation projects designed to improve the interoperability of installations and the complementarity of their activities.
- *Leverage on private investment.* Through EU research schemes, private companies can collaborate with foreign partners at a scale not possible at national level, in projects tested for excellence, which induces them to invest more of their own funds than they would under national funding schemes.
- *Reduction of commercial and research risk.* Investing in R&D is a risky business. Working in trans-national consortia helps firms to lower the risks, and thus encourages them to conduct research, which might otherwise to too high-risk. Involving key EU industry players helps ensure that research results and solutions are applicable across Europe and beyond, enables the development of EU- and world-wide standards and interoperable solutions, and offers the potential for exploitation in a market of 450 million people.
- *Improving S&T capabilities*. Research teams wishing to develop their S&T capabilities in specific fields can participate in top trans-national teams, benefit from learning and synergies, and so become recognised world centres of excellence.
- *Stimulating training of researchers and encouraging international mobility.* EU actions provide a common framework for breaking down barriers to researchers' mobility. By encouraging work in international teams, and promoting networking, EU funding stimulates the international mobility of researchers, including mobility between university and industry. International mobility is a powerful vehicle for the transfer of knowledge and skills across frontiers, and can also play a part in increasing the flexibility of supply of highly skilled personnel. Active participation in EU projects is regarded as a valuable competence in a researcher's career. It demonstrates not only scientific capacity, but also "savoir faire". It trains young research managers to perform better in an increasingly global competitive economy.
- *Increase of competition in research*. The level of competition in research varies according to the Member State or region, in both basic and applied research. Some domains are highly specialized, with only a handful of experts in each country, so there is limited competition between research teams at national level. Similarly, in many industries, competition is really on an international level. EU funding helps to promote more competition in research leading to higher quality and excellence.

- *Pan-European challenges*. Public policy challenges have become increasingly international (e.g. environment, health, food safety, climate change) and dependent upon the establishment of a common scientific base. Moreover, research can lead to the establishment of uniform laws and standards. Given the shared interest and the scale on which these issues arise, such research activities are more effectively carried out at EU level.
- *Comparative research at EU level*. Scientific research in areas like epidemiology or comparative economic studies of competitiveness can only be addressed in an international context, and, given the scale of interest, can be more effectively carried out at an EU level.
- *Coordination of national policies*. There is still considerable overlapping and compartmentalisation of national research efforts. Better coordination of policies can help to target public investments more efficiently and reduce fragmentation. EU funding exercises a "catalytic" effect on national initiatives and improves the coordination of the activities of the Member States in areas of common interest (natural hazards, climate change).
- *Fostering multilateral cooperation between research actors in the different Member States*. Connected to the above, of which it can be seen as a subset or as a widening which recognizes that the involvement of the different public authorities in R&I processes can take various forms.
- *Visibility (at national, European, and wider international level)*. This applies to research carried out in Europe, to Europe as a space and platform for R&I, and to those researchers who operate therein. It is also crucial for cooperation with third countries, at global level.
- *EU-scale dissemination of results*. Connected to the above. It is more efficient to disseminate the results of research at an EU level – to users, industries, firms (SMEs in particular), citizens etc. – leading to a better exploitation of research, and giving a larger impact than would be possible at Member State level only.
- *Advancing Europe-wide values, objectives, and policies*. This is connected to the above discussion of Pan-European challenges, when one considers the possible role of research in furthering the common market or economic and social cohesion objectives for instance. But there is more: at some level, European added value is also about furthering the European project of integration and peace,[11] indeed about adding value to Europe. In fact both dimensions of 'value' are drawn upon, as promises of growth and competitiveness – or merely efficiency and effectiveness – are embraced together with support for the European project itself, for 'more and better Europe' in the form of furthered European interactions and values. [12]

[11] S&T research, with its association to universality, has repeatedly been called upon in a pacifying capacity in the history of the European Community (from the European Coal and Steel Community Treaty through to the accession negotiations with Turkey begun in 2005, where 'Science and Research' was the first *acquis* chapter addressed). This connection is further scrutinized in Dratwa, 2007.

[12] This begs the question of 'additionality' here too: are these European values at stake wholly 'common' (possibly as a minimalist or lowest common denominator) or are they idiosyncratic and

As value added is value added *to*, it requires a benchmarking, and indeed a taking into consideration of the policies at play at all levels (community / international, national, regional). This calls for evidence-based assessments to be carried out at national level, too. The aforementioned comparative exercise cannot have a basis otherwise (other than theoretical or anecdotal). Furthermore, in fact what holds true for European policies also holds true for national policies. Their assessment, in order to be sound, has to take into consideration the policies at play at community level as well as in the other Member States for instance. In order for the European Research Area to be a functional area, the various actors have to – at the very least – *know*, what the others are doing. This is a *sine qua non* for actions aiming at cooperation, coordination, integration, or merely synergy. Hence, the usefulness to have common methodologies to develop these assessments (for comparability, sharing, 'interoperability' of the data).

The issues of European added value and subsidiarity are important for the current R&I policy debate, because one of the main aims of the European Research Area is to open up the system so that research can be carried out at the level where it can be most efficient and effective: be it regional, national, intergovernmental or EU. To make good decisions about how best to organise the EU research system across these different levels requires an objective analysis of the effectiveness of various policies at each level. But it is currently impossible to make such comparisons in an evidence-based way, because we do not have comparable data on the impacts of research actions at each of these levels. This is because research evaluation systems in Europe are themselves highly fragmented, and do not operate with common evaluation principles, which makes it difficult to analyse in any depth issues relating to added value and subsidiary. There needs to be a more integrated European research evaluation system, which employs some common guidelines and methodologies for regional, national, EU and inter-governmental programmes. Such a common system would help to assess the extra benefits from EU intervention, by providing information not only about the impact of Framework Programme projects and programmes, but also comparable data about the impact of possible alternative national or regional schemes.

We also need to re-examine some of the concepts underpinning EU intervention, and carry out deeper analyses of some of the key principles. A more solid and evidence-based approach is required, for example to examine issues like the

---

distinct from values pervading other levels of governance. The high politics and preparations of the Charter of Fundamental Rights and of the Constitutional Treaty, like any IGC, provided obvious forums for debate on ideational or normative factors. But I have shown (Dratwa, 2004 and Dratwa, 2008) that more technical, bureaucratic, mundane activities could be as crucial and illuminating as regards the elicitation or production of those European values and epistemic frameworks.

effect of trans-national cooperation on critical mass and economies of scale in research. In general, more theoretical and empirical work is needed to develop our understanding of European added value in the future. But there needs to be recognition that the criterion of added value must cut both ways if Europe is to build a truly effective research area. It should be used as a key principle for deciding which actions are worth launching at EU level. However, logically it should also be used as a criterion for policy at all the other levels of governance too: national, regional, intergovernmental. We need to ask not just "what is the European value added" but also "what is the national value added, or the regional value added"?[13]

In this context, ex-ante impact assessment could be implemented more systematically at national level, as well as at EU level, as a tool to shape research policies, and to examine the options for implementing actions at regional, national or EU levels. This would require a degree of openness and courage previously lacking in European research policy. It means that policy makers at regional, national and EU levels should introduce into their ex-ante policy appraisal the question about the level at which an action could best be implemented. In addition, it implies that sometimes policies will need to be shifted from one level to another so that they can be more effective. Under this new approach, the European research system would no longer be a series of largely separate and independent levels of governance, but rather a joined-up, coordinated, and flexible system, with policies moving to the level where the evidence shows they will have the greatest impact.

This would be a great stride as regards vertical policy coordination, and is a fitting conclusion in this respect, but impact assessment can be a tool as regards horizontal policy coordination too. **The Lisbon Strategy and the dynamic knowledge economy it calls upon are political objectives of the highest order for Europe.** A crucial question thus arises: how are R&I (and more widely knowledge triangle, knowledge economy) policy objectives/considerations taken into account in the making of other policies? Arising, too, is a call for measuring – and indeed improving – the extent to which and the ways in which those objectives/considerations are taken into account beyond research policy. In the perspective of Better Regulation this question is key as it determines to what extent these policies are indeed (substantively, in regard to those objectives) 'better'.

[13] Such an approach was also recommended in the context of Nordic R&I cooperation (i.e. between Denmark, Finland, Iceland, Norway, and Sweden), namely to assess the *nordisk nytta* – or 'Nordic added value' – of envisaged initiatives not only with respect to national intervention but also with respect to European-level intervention, in PLS Consult (1998).

References:

1. André, M. (2006), *L'Espace Européen de la Recherche: Histoire d'une Idée*, *Journal of European Integration History*, Vol. 12, No. 2, pp. 131-150.
2. Centeno, C., R. van Bavel and J. C., Burgelman (2004), *eGovernment in the EU in the Next Decade: Vision and Key Challenges*, European Commission, DG JRC – Institute for Prospective Technological Studies.
3. Dratwa J. (2002), *Taking Risks with the Precautionary Principle: Food (and the Environment) for Thought at the European Commission*, "Journal of Environmental Policy and Planning", Vol. 4, No. 3, pp. 97-213.
4. Dratwa J. (2004), *Social learning at the European Commission and the Codex Alimentarius*, In: B. Reinalda & B. Verbeek (eds), *Decision Making within International Organizations*, London and New York: Routledge.
5. Dratwa, J. (2007), *Risque, Rixe, Rhizome: Guerre et Paix avec lâ□□Analyse des Risques et les Organisations Internationales*, In: G. Hottois & C. Kermisch (eds), *Techniques et Philosophies des Risques*, Paris: Vrin.
6. Dratwa, J. (2008), *Representing Europe with the Precautionary Principle*, In: S. Jasanoff (ed.), *Reframing rights: constitutional implications of technological change*, forthcoming.
7. e-Government Strategic Support Unit (e-GSSU) (2004), *Engaging the Community in e-Government*, Office of the Deputy Prime Minister, UK.
8. European Commission (2004), DG INFSO, *Impact of ICT on Sustainable Development*.
9. European Commission (2005), *Working Together for Growth and Jobs, A New Start for the Lisbon Strategy*, Communication to the Spring European Council 2005, COM(2005) 24, 3 February.
10. European Foundation for the Improvement of Living and Working Conditions & PREST (2004), *The Knowledge Society Delphi: EUFORIA Project Report*, Manchester Business School.
11. Ezrahi, Y. (1990), *The Descent of Icarus: Science and the Transformation of Contemporary Democracy*, Cambridge (MA): Harvard University Press.
12. Kok report (2004), *Facing the Challenge. The Lisbon Strategy for Growth and Development*, Report from the High Level Group Chaired by Wim Kok, Brussels, November.
13. Kuhlmann, S., Edler, J. (2000), *Scenarios of Technology and Innovation Policies in Europe: Investigating Future Governance*, In: "Technological Forecasting & Social Change", Vol. 70, pp. 619-637.
14. Lundvall, B-A. (1992) (ed.), *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*, London: Pinter Publishers.
15. Muldur, U., Corvers, F., Delanghe, H., Dratwa, J., Heimberger, D., Sloan, B., Vanslembrouck, S. (2006), *A New Deal for an Effective European Research Policy: The Design and Impacts of the 7th Framework Programme*, The Hague and New York: Springer.
16. OECD (2005), *Governance of Innovation Systems – Volume 1: Synthesis report*, Paris: OECD.

17. PLS Consult (1998), *Hele Norden som base: Utredning om nordisk erhvervs-/nÆŚringsrettet innovationssamarbejde*, Copenhagen: PLS Consult.
18. Rabeharisoa, V. and M. Callon (2004), *Patients and Scientists: French muscular dystrophy research*, In: S. Jasanoff (ed.), *States of knowledge*, London: Routledge.
19. Remøe S. O. (2005), *Governing Fragmentation: The Case of Norway*, In: *Governance of Innovation Systems: Vol. 2. Case Studies in Innovation Policy*, OECD, Paris.
20. Sanga, O. (2000), *Information and Communication Technologies and Social Development in Senegal: an Overview*, Geneva: United Nations Research Institute for Social Development.
21. Scott J. C. (1998), *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*, New Haven: Yale University Press.
22. Zongo, G. (2001), *Information and Communication Technologies for Development in Africa: Trends and Overview*, International Development Research Centre, http://www.unssc.org/web1/programmes/glnp/Knowledge_Sharing/case_studies/IT_African_Development.PDF.