

What about the Regions in EU Technology Policy?

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1. Introduction

One look at Europe's regional map reveals unmistakably how different Europe's regions are. What they seem to have in common is their diversity: whether it concerns their economic performance, sectoral specialisation, regional culture, natural endowments, or political decision power, to name a few aspects (Cole & Cole 1993; Button & Pentecost 1999; Corvers 2001).

Yet, the isle of Crete as well as the northern fringe of Scandinavia, the old industrial heart of England as well as high-tech regions such as Stuttgart and Midi-Pyrénées, they all belong to the European Union.

Indeed, one of the main challenges of formulating EU policy has always been to seek out common features and to find compromises amongst the diversities which remain (Button & Pentecost 1999:7).

That is also why reducing economic disparities between regions in terms of levels of development has always been at the heart of European integration (Treaty on European Union art.158, ex-art.130a). In order to achieve this, it was considered appropriate, if not necessary, to intervene in the spatial distribution of economic performance by means of public policy. Whether these interventions have been a success, has been the subject of many studies (Molle 1980; Molle & Cappellin 1988; Armstrong & Taylor 1993; Bachtler & Turok 1998; Rodríguez-Pose 1998; Fagerberg, Guerrieri & Verspagen 1999).

Nevertheless, as too much economic divergence has always been considered counter-productive to the 'overall harmonious development' of the EU, public policies have been put in place at Community level to reduce 'disparities between the levels of development of the various regions and the backwardness of the least favoured regions or islands, including rural areas' (TEU art.158, ex-art.130a). The most well-known are the Structural Policies administered by the Regional Policy Directorate-General, but also policies dealing with Research and Technological Development (RTD) administered by the equivalent Directorate-General seek to strengthen Europe's 'economic and social cohesion' (TEU art.158, ex-art.130a).

A recent strategy paper from the European Commission brings these two hitherto distinct EU policy areas – regional policy and research policy – together. Building on experiences made with regional innovation policy schemes at Community level in the nineties, this joint Communication presents an outline of a more regionalised RTD policy at Community level.

In order to understand the ‘new’ Community research policy, this chapter will not only describe the main features of this policy, but also the main development stages of Community research and technology policy in general. Before that, the chapter will start with some regional RTD information in order to raise awareness for the magnitude of regional differences between European regions that underlie economic growth and development.

2. Regional differences in R&D: is there a technology gap?

It is well established by now that ‘technological change’ – often shortened to ‘innovation’ – is among the main determinants of productivity growth.¹ ‘Productivity is the key to increasing real income and competitiveness and is one of the most important yardsticks of industrial performance’, to quote a recent OECD report (OECD 1999:17).

What applies for national economies, also applies for regional economies. Innovation has become a distinguishing factor separating the economically successful from the less successful regions. Something that gives policy-makers great concern given the striking differences in innovation performance among European regions.

Taken as a proportion of GDP (gross domestic product), gross expenditure on research, technological development and innovation in Europe’s 25 least-favoured regions is less than a quarter of the EU average (ITT Newsletter 05/2001:20).

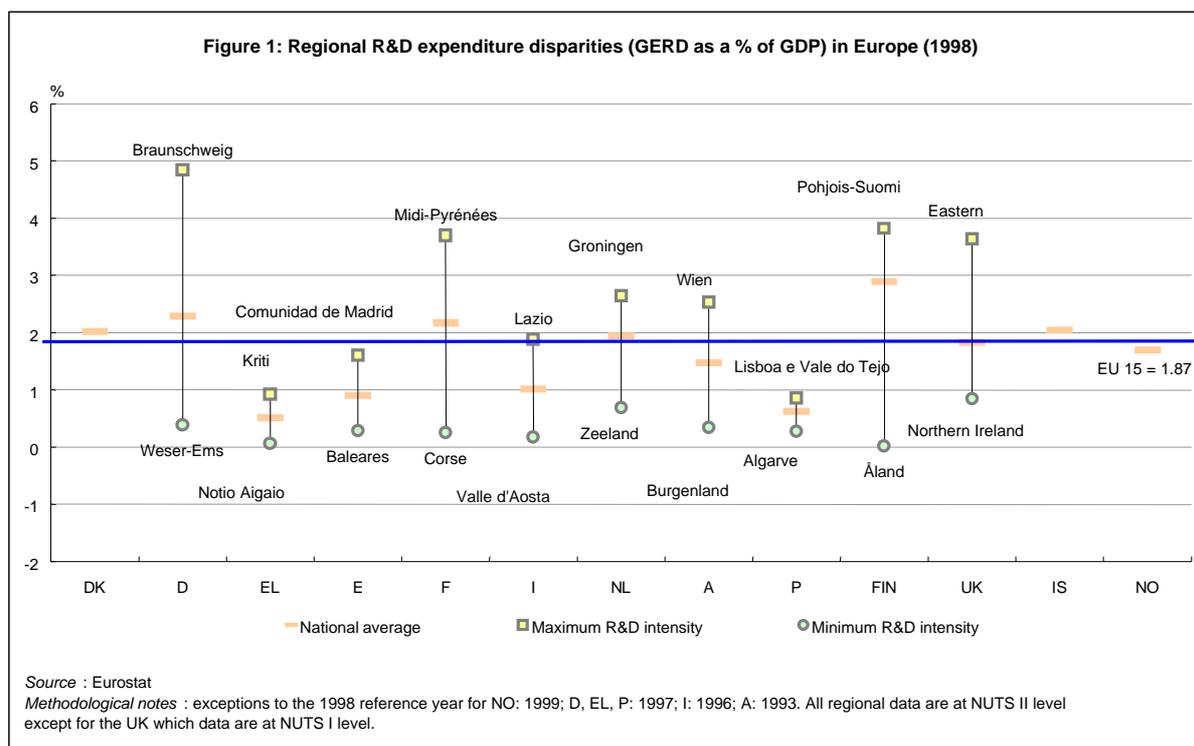
Figure 1 is based on the same indicator of R&D intensity², showing remarkable differences in R&D investment between European regions. The Greek archipelago of island regions Notio Aigaio spends a mere 0.06% of its GDP whereas the German region Braunschweig – home to Volkswagen automotive sector – spends 4.84 % of GDP on R&D, far above the EU average of 1.87% of GDP (1997 data; EU average 1998).

¹ Schumpeter divided ‘technological change’ into three stages (Schumpeter as quoted in Stoneman 1995:2):

1. invention, encompassing the generation of new ideas;
2. innovation, encompassing the development of new ideas into marketable products and processes;
3. diffusion, when the new products and processes spread across the potential market and the impact of new technology happens.

Besides the Schumpeterian description of innovation as one of the three stages making up technological change, innovation is often widely used as synonym for the whole process of technological change (Stoneman 1995:3).

² R&D intensity is defined as ‘gross expenditure on research and development [= GERD] measured as a % of GDP [= Gross Domestic Product]’. GERD can be subdivided in BERD [= business enterprise expenditure on research and development], GOVERD [= government expenditure on research and development], HERD [= higher education expenditure on research and development] and OTHER [= for example expenditure on research and development from abroad].



One could draw at least three conclusions from Figure 1. One, the average R&D intensity does not only vary between countries, but also and more profoundly between regions. The ‘technology gap’³ between the approximately two hundred regions⁴ in Europe, therefore, is far greater than the ‘technology gap’ between the fifteen Member States.

Two, ‘best’ performing regions in terms of R&D investments as well as ‘worst’ performing regions can be found throughout the European Union. Across Member States, best performing regions seem to share similar characteristics just as worst performing regions are.⁵ For example, the German region Weser-Ems invests only 0,39% of its GDP to R&D which is twelve times less than the before-mentioned Braunschweig region, but the same as Extremadura, Spain (0,39%, 1997 data). Both regions share a development gap separating the more densely and urban parts of the region from their agricultural hinterland.

³ The ‘technology gap’ refers to the disparities in R&D spending relative to GDP between countries or regions. The technological disparities between Europe’s regions are far greater than their economic or wealth disparities. Moreover, instead of convergence at the regional level, some authors argue that one can observe divergence – an increasing gap between technologically advanced regions and less technologically advanced ones. For those interested in the ‘convergence versus divergence’ debate, a good starting point might be ‘The Economic Challenge for Europe: Adapting to Innovation Based Growth’ by Jan Fagerberg, Paolo Guerrieri and Bart Verspagen, published in 1999 by Edward Elgar.

⁴ Based on the NUTS classification of EUROSTAT. The ‘Nomenclature d’Unités Territoriales Statistiques’ (NUTS) – translated into English as ‘nomenclature of territorial units for statistics’ – was established by EUROSTAT to provide a uniform and consistent breakdown of territorial units for the production of regional statistics for the European Union. NUTS subdivides the fifteen Member State into 78 regions at NUTS I level, 211 regions at NUTS II and 1093 regions at NUTS III.

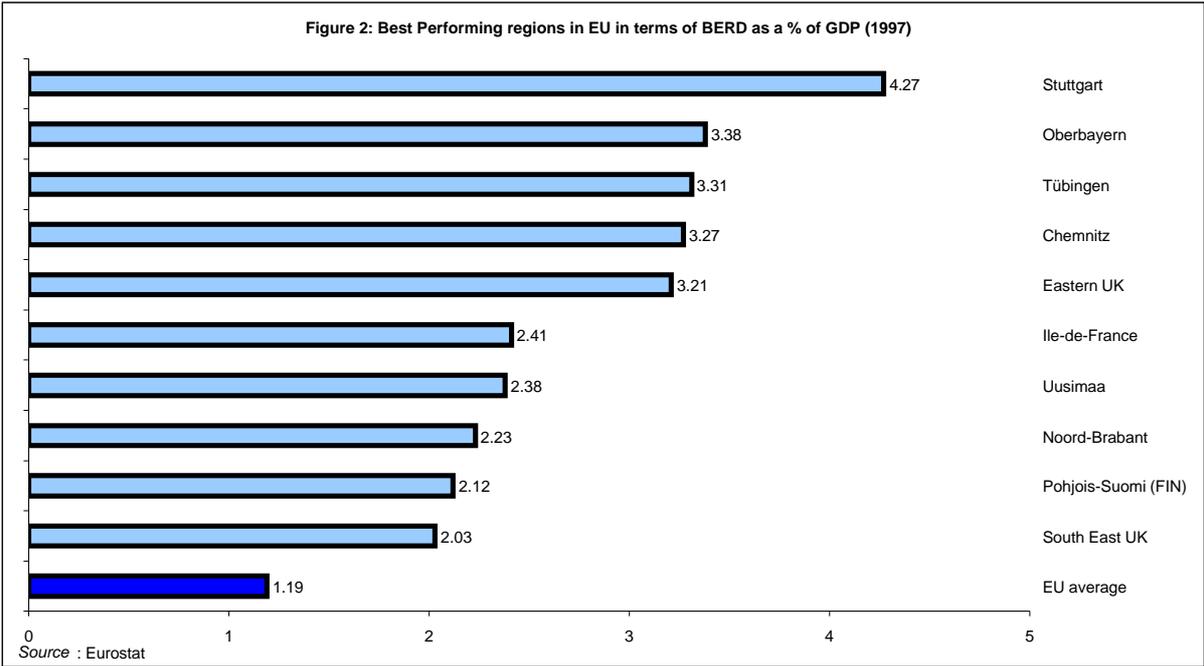
⁵ An interesting typology of European regions in terms of their R&D performance was presented in the Second European Report on Science and Technology Indicators (1997), published by the European Commission.

Three, not surprisingly are the regions that are the best performers in their home country, often large metropolitan areas such as Comunidad de Madrid in Spain, Lazio around Rome, Vienna in Austria, the greater Lisbon area and Eastern UK south of London, which provide firms with a thriving business environment due to economies of scale and scope, a concentration of highly qualified people and a political power centre.

3. Regional differences in business expenditure on R&D: is there a North-South divide?

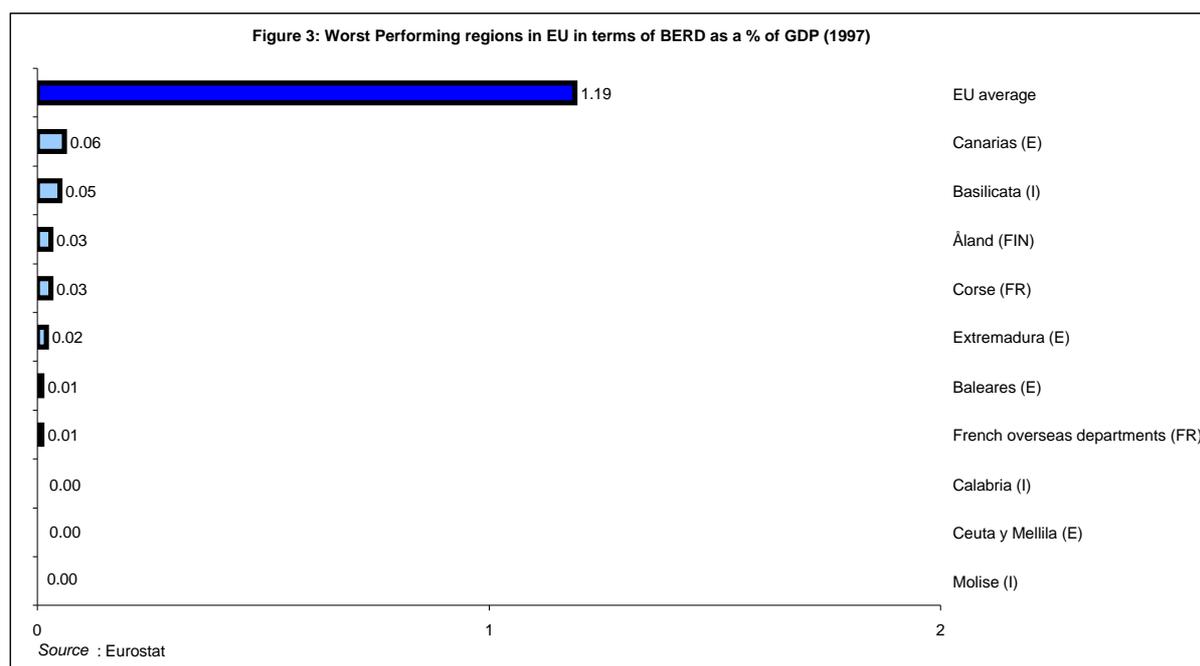
One of the indicators on which the GERD indicator – Gross Expenditure on Research and Development – is based, is BERD or ‘Business Enterprise Expenditure on R&D’. Business investments in R&D are a good indicator – among other things – for the capacity and capability of firms to invest in complex, risky and uncertain innovation endeavours. These large up-front investments might generate new company profits, but they might also not. A region that can call itself home to innovation-prone companies is likely to belong to the group of economically successful regions.

Looking closer at the business expenditure on R&D, a clear ‘North-South’ divide seems to exist. The top ten of best performing regions in terms of BERD are located in Germany, Finland, United Kingdom, France and the Netherlands. Besides large metropolitan areas such as Greater Paris, Greater Helsinki and Greater London, one can see so-called ‘intermediate’ regions with strong innovative business presence such as Noord-Brabant (Philips research facilities), and even peripheral regions such as Pohjois-Suomi around Oulu (famous science-based Technical University) and Chemnitz (high tech region with strong presence of university, research institutes and high tech spin-off companies).



The bottom ten of worst performing regions as far as business sector investments in R&D are concerned, are mostly Objective 1 regions and located in the peripheral parts of Spain, Italy,

France and Finland.⁶ It is striking to see that low business expenditure for R&D is strongly biased towards the southern regions of the EU with Åland in Finland being the only exception in geographical terms. As has been noted before, the less favoured regions in Europe show a consistently low level of R&D investment coming from the business sector. This low level of undertaking some form of internal R&D activity results in sub-optimal absorptive capacities that could enable firms to take advantage of knowledge spill-overs elsewhere in Europe. An ‘internal bottom-up learning process’ seems to be missing or not sufficiently developed in those companies (Antonelli & Calderini 1999).



As said above, technological change or innovation is considered to be an important factor promoting regional economic growth and development (which incorporates softer aspects such as sustainability, environmental, human potential).

New in the recent Commission Communication is the acknowledgement that not only applied research and technological advancements have distinct regional features. Small and medium-sized enterprises (SMEs) often lack the wider constituency of resources needed to innovate which could be provided for by the region’s innovation system.⁷ Also basic research and new-to-the-world technologies have a territorial dimension which has been neglected until now.

⁶ DG Regional Policy has defined three priority objectives for the Community Structural Policies (2000-2006) in order to reduce ‘disparities between the levels of development of the various regions and the backwardness of the least favoured regions.’ Objective 1 focuses on regions whose development is lagging behind, i.e. generating less than 75% of Community average of per capita GDP. Objective 2 deals with regions which are undergoing structural conversion in industrial, rural, urban or fisheries-dependent areas. Objective 3 intends to combat unemployment and social exclusion by means of modernising training systems and promoting employment. Objective 3 generates – as a thematic objective – regional effects as well.

⁷ According to the Green Paper on Innovation (CEC, 1995:45), ‘the local or regional level is in fact the best level for contacting enterprises and providing them with the necessary support for the external skills they need (resources in terms of manpower, technology, management and finance).’

Before discussing this Communication in detail, I will give a short overview first of how European research and technology policy came into existence. This will also enable the understanding of what is new about the Community's 'new' research policy.

4. The history of Community research and technology policy in short

It would be fair to say that RTD policy it is a fairly young policy area at Community level getting its first official mandate from the Member States some fifteen years ago. With the drafting of the Single European Act in 1986, RTD became the official responsibility of the European Commission which was incorporated in the Treaty on European Union five years later. The thirty years preceding the Single European Act, a true European research and technology policy did only exist as a supportive measure 'to improve the overall competitive position of European industry' focusing mainly on nuclear energy, coal and steel (Treaty of Rome art.3).

Since the mid-1960s, Community's research activities gradually extended to other fields besides nuclear energy, coal and steel, although the RTD landscape was still solidly dominated by national policies and their focus on creating 'national champions' (Peterson & Sharp 1998). This started to change in the early 1980s under the inspiring leadership of Commissioner Davignon and proved to be a period of policy transition within the European Community. At the most senior levels of EC policy-making in the 1980s, an active interventionist view was taken towards European high technology industry's competitive enhancement (Lawton 1999:28).

This new policy climate was reflected in the Single European Act which would prove to be a significant landmark in the development of European RTD policy when it came into force in 1987. The European Single Market initiative promoted greater concern with the competitiveness and productivity of industries and firms when free movement of goods, services, labour and capital was going to take place in the European Union. Research and technological development, and more generally, the capacity to innovate and upgrade, particularly in products and processes, started to gain importance among EU policy-makers as one of the essential factors shaping Europe's competitiveness (CEC 1994).

With the ratification of the Treaty of Maastricht in 1993, the objective of Community RTD policy became 'the strengthening of the scientific and technological bases of Community industry and encouraging it to become more competitive at international level, while promoting all the research activities deemed necessary by virtue of other chapters of the Treaty' (TEU art.163, ex-art.130F).

Box: Arguments in favour of a European RTD policy

Among the arguments given why RTD policy should have to be undertaken at Community level in addition to Member State level, are:

- economies of scale (greater efficiency given costs)*
- economies of scope (joining forces, added value)*
- transnational problems (HIV, BSE)*
- contribution to EU policies (cohesion)*
- needs of citizens (health, environment).*

In the early 1990s, the idea grew stronger that Europe had serious problems in converting basic research results into commercial profitable products, despite its strong technological base. The so-called 'European innovation paradox' referring to its innovation deficits was born (Muldur 2001). Two important strategy papers from the Commission analysing these problems and suggesting solutions should be mentioned here: the White Paper on Growth, Competitiveness and Employment (CEC 1993) and the Green Paper on Innovation (CEC 1995).

The 1993 White Paper on 'Growth, Competitiveness and Employment' identified a number of weaknesses from which Europe suffered, including unduly low levels of RTD investment, a lack of co-ordination at various RTD levels and a comparatively limited capacity to convert scientific breakthroughs and technological achievements into industrial and commercial success. A similar list of weaknesses emerged from the 1995 Green Paper on Innovation. The White Paper identified the need to define a global strategy bringing together the public authorities, research bodies and the various sectors of society concerned, while the Green Paper stressed the importance of the regional level in the formulation and implementation of such a strategy.

In 1996, the European Commission launched a big debate on innovation in Europe. The basis for discussion was the aforementioned Green Paper on Innovation, adopted by the European Commission in December 1995. The Green Paper analysed in detail the climate for innovation in Europe, concluded that improvement was essential and presented a comprehensive set of proposals. The main question of the debate was "what are the factors that encourage - and discourage - innovation in Europe?" Despite Europe's excellent scientific performance, the technological and commercial performance in high-technology sectors such as electronics and information technologies had deteriorated over the last fifteen years. Four main obstacles were identified:

1. The financing of innovation; Europe does not seem to have the financial mechanisms to fulfil the needs of innovative 'growth firms' to the same extent as its rivals.
2. The protection of innovation; the patent system in Europe is more costly, less understood and therefore less used than in USA or Japan.
3. The administrative environment is more complicated than it need be, particularly for small and medium-sized enterprises.
4. The research effort is insufficient, particularly when measured in number of R&D scientists and engineers in the workforce (EU 4.5 per thousand compared with 7.6 in USA and 8 in Japan).

In order to remedy the obstacles, an Action Plan was prepared and adopted by the European Commission in December 1996. The Action Plan addressed three key questions:

1. how to foster a real innovation culture in Europe (focus on education and training, mobility, innovation management in companies);
2. how to make sure that the environment in Europe allows innovation to thrive (focus on establishing a favourable regulatory and administrative framework, intellectual property rights);
3. how to improve the link between Europe's research capabilities and innovation (focus on start-up of technology-based companies, university spin-offs).

Thanks to these policy documents, 'innovation' got a prominent place on the political agenda during the second half of the 1990s, not only at EU level, but also at national and even regional levels of government.

Looking at Community RTD policy from an historic point of view, one could say that it has moved from being a minor industrial policy instrument in the 1950s to becoming a research and technology policy in its own right in the 1980s with its own set of instruments – the Framework Programmes are the most well known ones – and an increasing budget over the past fifteen years.

5. A new vision on Europe's research policy: building a European Research Area

At the start of his mandate in 2000, the new Commissioner for Research, Philippe Busquin, launched a new vision on Europe's research policy called the 'European Research Area'. The European Research Area could be considered a new landmark for RTD policy at EU level as it advocates a fundamental reshaping of relationships between 'layers and players' in the RTD landscape.

On 23-24 March 2000, a European Council was held in Lisbon under the Portuguese Presidency and its key strategic objective endorsed by the Member States was set 'to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion'.⁸

Given the significant role played by research and technological development in generating economic growth, employment and social cohesion, it was agreed in Lisbon that the Union must work towards the objectives set out in the Commission's communication 'Towards a European Research Area'. Research activities at national and Union level must be better integrated and co-ordinated to make them as efficient and innovative as possible, and to ensure that Europe offers attractive prospects to its best brains. The instruments under the Treaty and all other appropriate means, including voluntary arrangements, were to be fully exploited to achieve this objective in a flexible, decentralised and non-bureaucratic manner. At the same time, innovation and ideas should be adequately rewarded within the new knowledge-based economy, particularly through patent protection.

The idea of ERA centres around an institutional reshaping to turn the EU into one 'European Knowledge System' – which functions as a true Single Market for research – based on a new rationale for Community action in the area of science and technology and a new form of Commission involvement in the management of European RTD policy.

Similar to the early 1990s, the European Research Area is based on an observation of what is wrong with Europe's research and how to cure it. This time the main problem seems to be that research in Europe is not only diverse, but also highly fragmented. As Cannell (2001:207) describes it 'it [Europe's research] operates, for the most part, within national structures, of funding, regulation, and administration. These act in parallel with one another, and with the actions of the Union and other European co-operation frameworks, with very little co-ordination. The result is a highly sub-optimal overall environment for research, with numerous rigidities, overlaps and duplications.'

⁸ The Conclusions of the European Council Meeting in Lisbon of 24.03.2000 can be downloaded from <http://ue.eu.int/en/Info/eurocouncil/index.htm>.

The European Research Area intends to promote a more coherent overall policy framework and has – as such – ‘the ambition of *re-inventing* the European research landscape, in *re-defining* the roles of each of the players (including public authorities and private operators) and *re-configuring* the processes and policies that underpin the research effort in Europe’ (Mitsos 2001:2).

The major challenge of European Union research policy is therefore not the implementation of research action on the Community’s behalf – although that will remain in place based on the arguments given earlier (see Box) –, but the development of greater coherence between national frameworks for action (Cannell 2001:210).

Seeing Europe’s research landscape as a system containing of different ‘layers and players’, the European Research Area requires more ‘governance’ instead of more ‘government’. Activating the self-organising elements of this system can be done in various ways. One until recently neglected way is to integrate the regional dimension more actively in the European research governance system.

6. Building a European Research Area means involving Europe’s regions

The European Research Area introduces the idea of building upon the potential of the regions and using ‘prime regional movers’ to develop a more dynamic scientific and technological landscape. Although new within the ‘research policy’ context, other Community policy areas already experimented with this idea during the 1990s in the so-called RITTS/RIS projects.⁹

During the second half of the 1980s, it was considered increasingly necessary for European technology policy to dedicate more attention to SMEs, if this policy was to succeed in strengthening Europe’s ‘economic and social cohesion’ (TEU art.158, ex-130a).

During that same time period, the Union’s regional policy increasingly emphasised the importance of innovation and RTD for regional economic development purposes – besides the classical focus on physical infrastructure – and intangible investments in education, training, research and innovation. This insight led to a change in ideas underlying both technology and regional policy resulting in the emergence of a new policy field: regional innovation policy (Corvers 1996, 2002).

Since 1994, Regional Innovation Strategies (RIS), under the European Regional Development Fund (ERDF), and Regional Innovation and Technology Transfer Strategies (RITTS), under the third activity of the Fourth and Fifth Community RTD Framework Programmes, have served as experimental policy tools for developing innovative capacity in the regions.

In the past eight years, more than hundred regions have participated in the RITTS/RIS schemes and positive evaluation results can be shown.¹⁰ In 1998, the concept was further developed by the Commission through the RIS+ initiative, aiming to ensure that the work

⁹ More information can be downloaded from <http://www.innovating-regions.org>.

¹⁰ CEC, 1997, External Evaluation of the Regional Technology Plans. Technopolis Ltd. in co-operation with the University of Athens; CEC, 1999, On-going Evaluation of the Regional Innovation Strategies under Article 10 of the ERDF. ECOTEC Research and Consulting Ltd.; CEC, 2000, Assessment of the Regional Innovation and Technology Transfer Strategies and Infrastructures (RITTS) Scheme. CURDS, MERIT, PAR, ÖIR.

begun under the RITTS/RIS projects moves beyond the strategic framework for action towards a concrete implementation of new measures and projects. Further developments include the Transregional Innovation Projects and the Transnational Innovation Strategy Projects under the Fifth Community RTD Framework Programme, aiming to encourage the transfer of experience from RITTS/RIS regions to partner regions in the accession countries.

The objective of RITTS and RIS projects is to formulate a regional innovation strategy which identifies the strengths and weaknesses in the innovative capacity of the region, including management, training and organisational issues as well as purely technological ones. The development of such a regional innovation strategy should be the outcome of a process that involved all the regional actors related to RTD, innovation and associated business support activities.

The main idea behind RITTS and RIS is two-fold:

1. to improve the capacity of regional actors to formulate regional economic policy which take into account the real needs of the business sector, particularly small and medium-sized firms, and the strengths and capabilities of the regional RTD and innovation community;
2. to provide a framework within which both the European Union and the regions can optimise policy decisions regarding future investments in RTD, innovation and technology transfer initiatives at regional level.

The philosophy of having a bottom-up and tailor-made approach to research and technological development reflected in the 'new' Community research policy builds upon the good practices accumulated in the RITTS/RIS schemes.

The idea that 'local action should start from a shared diagnosis of the territory and the definition of common strategic objectives' is certainly RITTS/RIS inspired, as is the governance idea of 'integrating all local players in the regional strategy, including the regional authorities, the private sector, academic and RTD institutions, social partners and civil society' (CEC 2001:9).

7. Territorialisation of EU research policy: what are the main ideas?

This so-called 'territorialisation' of EU research policy addresses two main issues. First, increasing regional awareness of national research and innovation policies and tuning them towards the socio-economic needs of the region. Two, directing these policies to build research and innovation capacity in the regions, enhancing their ability to act as drivers for economic and technological development. This may be achieved through (CEC 2001: 7):

- establishing research and innovation strategies to develop material and human resources such as supplying research infrastructures and equipment, local university and training facilities, support structures to foster creation and growth of innovative enterprises, efficient interfaces within the innovation system linking, for example, researchers, innovators and sources of finance, science and technology parks, research programmes, initiatives to attract researchers locally or promote staff exchanges.

- fostering partnerships between the public and the private sector in order to contribute to the European knowledge-based economy and stimulate knowledge creation and diffusion.

- promoting an environment conducive to research and innovation, through the introduction of accompanying legal, financial and fiscal conditions, that would prove necessary.
- stimulating experience exchange with other successful regions in specific fields.
- contributing actively to an integrated strategy for sustainable development.

Streamlining the efforts of regions in an European Research Area mind-set should have two clear objectives both with a distinct added value for European research and innovation policies: first, to stimulate a better uptake of research results into the local socio-economic fabric (especially vis-à-vis small and medium sized enterprises) and help translate them faster into economic growth; and second, to increase public and private investment in research and innovation in the regions, thereby stimulating economic and social development.

Given the large variance in innovation performance between European regions – as we have seen in section 2 – less developed regions receive particular attention in this Communication. The idea is that the less developed regions have few chances catching up with the prosperous regions if they do not perform RTDI strategies comparable to the prosperous regions. Why? Because they are equally exposed to all challenges stemming from globalisation and competition. Therefore, they have to pursue genuine RTDI approaches if long-term perspectives are sought. According to the Communication, only by fully exploiting the synergies between cohesion and research policy could this goal be achieved.

8. Territorialisation of EU research policy: how can it be achieved?

In accordance with the European Research Area strategy and the priorities in the Structural policies of the Union, an increased synergy is foreseen within the next Community RTD Framework Programme (2002-2006). How does this work in practice? Whenever a project funded by the Framework Programme includes a participant originating from an Objective 1 region, funding of the part of the project that applies to that participant can be completed with co-funding through the Structural Funds. Two conditions should be taken into account: one, fully observing the existing legislation for state aids and two, fully observing the criteria of scientific excellence.

This special co-funding rule also applies to the new funding instruments for Community research – Networks of Excellence and Integrated Projects – and provide regions with two important tools to seize the opportunities of the Sixth Framework Programme.

Networks of Excellence – to be selected through Call for Proposals – can create better connectivity between central and peripheral hubs of scientific competence, thus offering increased opportunities for collaboration, staff mobility, information and knowledge exchange as well as positive spill-overs to the local and regional economies.

Integrated Projects – to be equally selected through Call for Proposals – will allow regional bodies to co-operate on a trans-national basis around specific scientific and technological objectives, aiming at concrete results.

The innovative capacity of Europe's less developed regions can also be assisted under the Innovative Actions (2000-2006) of the European Regional Development Fund. Intended for Objective 1 and 2 regions, the aim of this activity is to initiate innovative practices to improve structural interventions co-funded by ERDF. There are three themes in the Innovative Actions – Knowledge and Technological Innovation, Information Society, and Regional Identity and Sustainable Development – of which the first one is particularly significant for the accomplishment of the objectives of the European Research Area. Regions are encouraged to formulate regional programmes with the objective of increasing and reinforcing the co-operation and interaction between public research and the business community.

Achieving greater cohesion in the Union cannot be achieved without the active involvement of Objective 1 regions and 'depends directly on the creation of the necessary conditions for the integration of research capabilities existing in less favoured regions in the European research fabric' (CEC 2001:18).

9. Summary and Conclusions

The European Research Area concept implies that efforts should be deployed effectively at different administrative and organisational layers: at European, national, regional or even local level. In this way, measures would not only be mutually consistent, but better adapted to the potential of the regions themselves.

The regional dimension of the European Research Area – presented in a separate strategy paper from the Commission in October 2001 – introduces a more regionalised Community RTD policy.

This so-called 'territorialisation' of EU research policy is a two-way communication. Building up research and innovation capacities in Europe's regions will enable them to become better performers which are better equipped to deal with competition forces. The learning process that regions go through before they become better performers will increase their ability to identify their RTD needs. Being able to define and voice these needs, these regions can have a constructive interaction with other policy actors at other policy levels demanding more fine-tuning of national (and European!) RTD policies towards the socio-economic needs of the region. By doing so, the self-organising elements of Europe's Research System are activated bringing greater coherence between the different frameworks for action, creating more synergies and reducing fragmentation of activities and resources.

The Communication is not only interesting, because it launches this idea of territorialisation, but also because the implementation of this idea has at least three implications:

1. In the Communication, the region is seen as an actor in its own right, representing an economic system as well as political system whose forces can be mobilised in such a way that they can make a difference to the region's development path. An idea which has been around for some time now – both in the academic community as well as with policy-makers – but not all Member States equally subscribe to this in practice.

2. Another message of the Communication which has been around for some time as well is the idea that 'technological change' – in the Schumpeterian definition – is quintessential to economic growth, job creation, renewal of the industrial fabric, competitiveness – also at the

regional level. In this respect, it is important to emphasise again that the difference in RTD capacities and performance at national level are far less divergent than those differences measured by the same indicators at regional level. Sophisticating the system of regional RTD indicators and the up-to-dateness of data collection at regional level is paramount to design appropriate RTD policies at regional level.

3. In order to arrive at one European Research and Innovation System, an improved system of co-operation between stakeholders is crucial. It is more ‘governance’, not more ‘government’, that matters, bringing together different policy actors – at different policy levels – in different countries – involved in different policy areas – using different policy instruments. Making this system operational will be the true challenge of the European Research Area.

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