

European policies for Innovation and Cohesion; from loose coordination to partial integration

Willem Molle¹

**Paper for the annual international conference of the
Regional Studies Association**

University of Economics, Prague

27th -29th May 2008

¹ Associated with Erasmus University Rotterdam (molle@few.eur.nl) and
ECORYS Research and Consultancy, Rotterdam (willem.molle@ecorys.com)

1 Introduction

The EU is confronted with a series of important problems. The two that interest us most in the present chapter are lack of competitiveness on international markets and the considerable internal imbalances. Since quite some time the EU has put in practice policies to address these problems. But these policies have been evolving rather independently. Our objective in this chapter is to see in how far a further dovetailing of a key part of EU competitiveness policy, viz. innovation, and the EU policy to decrease imbalances, viz. cohesion policy can improve their effectivenessⁱ.

In order to tackle this question we have structured the chapterⁱⁱ as follows:

In the next section we will briefly describe the overall policy framework of the innovation policy, viz. the Lisbon strategy. We will mention its objectives, instruments, governance and also its inadequacies. The main inadequacy is the lack of funds. The solution that has been found to this problem is using the funds originally destined to address imbalances (Structural and Cohesion Funds) for the aims of innovation and competitiveness.

Next we will describe in some detail the problem of the EU regarding the spatial distribution of its innovation activity. We will indicate that innovation within the EU is largely concentrated in a limited number of countries in the North-west and within each member state in the more central regions.

The two sections that follow will go into the intricacies of the EU policies that are set up to deal with the two main problem areas that this chapter addresses. One is devoted to innovation policy, the following one to cohesion policy. In both sections we will follow the same structure. We describe in a succinct way the emergence and gradual development of the policy; the main ways in which it is delivered (through financial support to programmes and coordination of national regulation) and the incidence they have on each other (innovation policy on cohesion policy and vice versa).

We complement the chapter with a section that gives a synopsis of the solution that has been found for the coordination problem and conclude it with a section that gives some recommendations for a further increase in effectiveness.

2 The Lisbon Strategy: increasing competitiveness through innovation

2.1 Objectives: a hierarchy of primary and subsidiary goals

The EU faces a lack of competitiveness that can partly be attributed to a lack of innovation. The EU has for decades now tried to get to grips with this problem and has experimented with different policy solutionsⁱⁱⁱ.

At the turn of the century the EU has decided that a more bold initiative was needed to realise success. So the EU has set itself the *objective* 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. To realise this objective the so called Lisbon Strategy (LS) has been formulated, later complemented with the so called Gothenburg strategy, which has the objective to realise environmental sustainability. The original Lisbon Strategy refers only in a side way to the objective of cohesion (see EC 2000). In 2003 the Brussels European Council introduced a somewhat more explicit reference in the sense that it specified as an additional objective the reduction in employment disparities (EC 2003ab). All in all however, the cohesion objective is not central to the Lisbon/Gothenburg strategy.

To realize the ambitious objectives of the LS strategy a whole range of *intermediate policy goals* have been defined. They fall essentially in the following three categories^{iv}:

- Enhance the transition to a knowledge based economy and society. This category comprises: 1 an information society for all; 2 a European area of research and innovation and 3 a friendly environment for starting up and develop innovative SMEs.
- Sustain a healthy economic outlook and favourable growth prospects. This comprises the completion of the internal market; the creation of good macro economic and monetary conditions and the pursuit of an open external policy.
- Modernise the European social model. This comprises the stimulation of education and training (notably for the knowledge society); the modernisation of social protection systems and the promotion of social inclusion.

In this chapter we will address in particular the subjects described in the first bullet point. They relate to the positive influence that innovation has on growth^v. The *objectives* of the part of the strategy that deals mainly with *innovation policy (IP)*^{vi} are the following^{vii}:

- Improve IT infrastructure.
- Promote E commerce; E governance and E learning.
- Adapt legislation e.g. to increase competition of network providers; introduce a European patent.
- Develop R&D networks; electronic scientific communications, and improve the accessibility of research results throughout the EU.
- Increase competitive funding and focus in public research.
- Stimulate the diffusion of Innovation and Technology by promoting interaction between universities, firms and public laboratories.
- Promote entrepreneurship, access to finance; facilitate firm entry and exit; encourage an entrepreneurial spirit in society.
- Promote the dissemination of technology towards SMEs and improve the capacity of SMEs to identify, select and adopt technologies.

2.2 The main instrument: coordination

The Lisbon Strategy leaves implementation to a soft form of coordination. The actual delivery of the LS is very complicated due to the width of policy areas being addressed and the range of mechanisms for its implementation. What complicates it even more is the fact that most of the instruments are in the domain of the member states. So, the delivery of the strategy hinges on vertical coordination.

The EU has decided it would use the so called 'Open Method of Co-ordination' (OMC) to align EU and Member States' targets and instruments. In order to avoid the situation that Brussels would be perceived as telling the member states what to do, the idea of benchmarking was adopted. The best national practices would than be selected for adoption in other countries. In a sort of open market of competing policies, the best solutions would be selected by each member state. In practice it means:

- setting of EU Guidelines and their translation into policy targets and actions (benchmarks) on the national and regional level.
- setting up of monitoring systems to allow progress to be measured and “best practices” to be identified. To facilitate monitoring a system of indicators has been introduced (EC 2000)^{viii}. In matters of innovation these include on one hand indicators on spending (on R&D, human resources, ICT, etc.) and on the other hand indicators on the level of scientific and innovative activity (e.g. number of researchers, patents etc.).
- evaluating the progress made and subsequent adapting of the policy.

As illustration of the practice of the OMC method we mention the *eEurope Action Plans*. They aim to provide a framework that guides the adoption of new legislation by member states and the refocusing of national public expenditure to specific goals. The first E Europe Action Plan was agreed in 2002 and focussed on the potential of the Internet and hence on stimulating connectivity. The second one agreed in 2005 focussed on exploiting broadband technologies to deliver online services. Both specified very detailed targets as to the number of households to be reached by the Internet, etc.

It appeared however, that it is very difficult to identify which policy instrument could be called “best practice”. Due to the context dependency of many innovation policy issues the mere copying of policies that have proven to be successful in one country may not be the best solution for another country. In order to stimulate country specific solutions the accent is now put on National Reform Programmes (NRP). The OMC allows Member States to adopt an approach to implementation that best suits their administrative and policy contexts. This has certainly the advantage of flexibility. However it also has some disadvantages: it can lead to a lack of effectiveness and can undermine EU wide consistency.

2.3 Realisation; what reasons for the lack of results?

The *realisation* of the LS is not easy to catch in one or two words or figures; its complexity precludes that. So we have to see in detail its several aspects. In 2005 a study into the LS found that it had had a clear impact in the sense that a number of member states had increased their efforts devoted to R&D, IT infrastructure and the promotion of skills for the information society (DTI 2005, p 9). For instance Italy had decided to increase spending on R&D in the period 2003-2006 from 0.6% of GDP to 1.0 %; Denmark created a new high technology research fund of significant size; while Austria introduced tax schemes to boost private R&D.

Notwithstanding these encouraging signs the *general criticism* was that progress towards the higher objectives was too slow and that more should be done to come to the target results.

The *reason for the lack of progress* was generally seen in the poor match between ways and means. Indeed the EU has set very ambitious goals without providing adequate instruments to realise them. The OMC as a voluntary coordination of member states policies is dependent for its effectiveness on the degree to which member states agree with the objectives and are prepared to change their priorities accordingly. Up till 2006 the EU had not provided any additional incentives in the form of funds for supporting the compliance with the goals of the Lisbon strategy. It tried to redirect the budgets of the member states towards the common goals by peer pressure. The EU has also tried to mobilise more funds for its own budget items that

are particularly relevant for the LS, such as its Innovation and Research policy. For quite some time this has not been particularly successful, but recently the 2006-2013 budgetary framework did open some new opportunities in this respect.

2.4 The solution; use the Structural Funds for the Lisbon objectives, in particular innovation

As substantial new financial resources on the EU level were politically not feasible the suggestion has been made to use existing EU Funds and redirect them to LS targets. The most important financial resources of the EU that come into consideration are the Structural Funds and the Cohesion Fund (SCF). The main objective of these funds is to improve cohesion; in other words to decrease the disparities that exist between the “well to do” areas and the “backward” areas in the EU (Molle 2007). In other words cohesion policy (CP) aims at improving the structural features of the lagging regions and social groups, which should permit them to improve their performance and catch up with the EU average.

In order to find out whether this solution can work one need to analyse whether the objectives, means and governance systems of the two major policy fields (IP and CP) are congruent.^{ix}

A comparison of the fundamentals of both policies shows that there does not seem to be much of a consistency problem.

- On the CP side one notes that for a long time already innovation has been part of the promotion of regional competitiveness (see for instance Molle 1985a,b). Presently it is a very important element in the toolbox of regional policy (see e.g. Landabaso 1997).
- On the IP side one has in the past decade become increasingly aware that the effectiveness of innovation policy is enhanced in case it is implemented in a regional context (e.g. Cooke et al 2000). So, for an effective policy in matters of innovation the European, national and regional dimensions need to be integrated into one multi-level governance system.

Given this convergence of targets the EU has decided during the last major reform of the SCF to orient their resources more to targets that are in line with those of the LS; in other words it has decided to use the SCF as instruments for the LS^x. In order to improve the consistency it has been decided that the time horizons of the policies had to be made identical (2006-2013 perspectives) and that bridges of coordination need to be built between the institutions that are responsible for the operational aspects of both policies^{xi}.

2.5 Increasing effectiveness through stronger coordination

On closer look it appears however, that everything is not as well adjusted as one might hope. Indeed there remain quite a few issues to be tackled to come to a consistent system in which the processes of intervention of the cohesion and innovation policies become complementary and mutually reinforcing. For example:

- The two policies have a different treaty basis. R&D and innovation policies target specific themes, while cohesion policies target specific areas. It means that the first uses a set of instruments that results in thematic specialisation, while the second results in an integrated approach.

- There are considerable differences in implementation methods. Innovation policy essentially uses an EU wide competition for funds that can be gained on the basis of proofs of excellency. Cohesion policy is implemented in a multi layer partnership approach searching for consistency on the level of a specific region.
- The Lisbon Strategy if not properly implemented could aggravate inter-regional disparities rather than reduce them. Arguably regions that are already endowed with the factors that stimulate competitiveness (e.g. a dynamic SME and corporate business base, a highly educated work force, state of the art ICT infrastructure, modern service economy, developed research sector) are better placed to benefit from the strategy's implementation. So, to preclude such negative effects a constant assessment of technology policies with a regional (cohesion) impact is needed. The more the innovation (incl. research and technological development) policies are geared towards equity the less need there is for compensatory cohesion policies^{xii}.
- For the Lisbon Strategy to be delivered successfully at the regional level, the heterogenous nature of regions must be recognized. All regions are different and the mixture of factors that determine competitiveness and innovation vary across regional types (CE /ECORYS 2003). Therefore, a clear understanding is needed of the interventions that can best be implemented and funded in differing kinds of objective 1 regions (convergence) notably in the accession countries and in objective 2 (competitiveness) regions in order to use best their available specific factors of competitiveness.
- This flexible approach is dependent on having the appropriate regional *administrative and governance systems* that can deliver Lisbon aligned innovation and regional development policy measures and interact with appropriate institutions and policies at the national and European levels. The appropriate administrative capacity will be a key factor in its successful implementation in the European regions.

3 National and regional differences in innovation

3.1 Concepts and data

In order to track the progress of the strategy in matters of innovation the European Commission has developed the European Innovation Scoreboard. It focuses on high-tech innovation and provides national data on some 20 indicators. Similar data have been assembled for regions. These indicators refer to the creation of new knowledge (e.g. R&D expenditure, patents); the transmission and application of existing knowledge (e.g. investment) and the marketing of products in which innovation has been materialized.^{xiii} These data permit us to depict the differences between national and regional levels of innovation in the EU.

The theoretical discussion in the previous section suggests a chain relation between the determinants of innovation, the level of innovation and economic performance. This is indeed what the data reveal: a close correlation between the indicators of the knowledge society and those on wealth, economic structure and human resources^{xiv}. However, this (cor)- relation is far from perfect and hence it is interesting to see how the detailed picture for countries and regions presents itself.

3.2 The national picture

In the next table we present for five basic indicators the performance of the member countries of the EU in terms of innovativeness. This information is limited to the recent situation; lack of comparable data for the past prohibits the analysis of developments over time. The basic data have been rearranged in several ways. First all indicators have been recalculated so as to produce a maximum of 100 and a minimum of 0.^{xv} Moreover, a synthetic index has been constructed in order to get to a simplified picture. Finally the EU member countries have been grouped^{xvi} according to a combination of geography (North, South and East) and date of EU membership (old and new).

Table 1 Innovation indicators by country (100 is best) (around 2003)

| <i>Country</i> | <i>Public R&D Expenditure</i> | <i>Business R&D expenditure</i> | <i>EPO high-tech patent applications (per million population)</i> | <i>Innovation expenditures (% of total turnover)</i> | <i>Internet access (composite indicator)</i> | <i>Summary Innovation Index</i> |
|----------------|-----------------------------------|-------------------------------------|---|--|--|---------------------------------|
| Germany | 70 | 51 | 38 | 29 | 72 | 56 |
| France | 77 | 40 | 26 | 26 | 34 | 46 |
| Italy | 47 | 15 | 6 | 19 | 43 | 31 |
| Netherlands | 74 | 30 | 77 | 13 | 77 | 45 |
| Belgium | 49 | 48 | 23 | 28 | 67 | 47 |
| Luxembourg | 0 | 48 | 6 | 10 | 61 | 29 |
| UK | 53 | 37 | 26 | 17 | 69 | 49 |
| Denmark | 70 | 52 | 37 | 0 | 89 | 54 |
| Ireland | 25 | 23 | 22 | | 51 | 44 |
| Spain | 37 | 15 | 3 | 9 | 37 | 30 |
| Portugal | 53 | 8 | 0 | 28 | 27 | 30 |
| Greece | 34 | 5 | 1 | 20 | 28 | 20 |
| Austria | 57 | 36 | 19 | | 53 | 39 |
| Sweden | 92 | 100 | 62 | | 100 | 76 |
| Finland | 100 | 71 | 100 | 26 | 69 | 75 |
| EU15 | 62 | 38 | 26 | 22 | 57 | 44 |
| Poland | 36 | 2 | 0 | 17 | 27 | 14 |
| Czech Rep. | 37 | 21 | 0 | 7 | | 27 |
| Hungary | 58 | 9 | 3 | 11 | | 25 |
| Slovakia | 14 | 8 | 0 | 100 | | 24 |
| Slovenia | 54 | 26 | 3 | 10 | 45 | 32 |
| Lithuania | 45 | 2 | 1 | 16 | 7 | 26 |
| Cyprus | 14 | 0 | 0 | | 44 | 17 |
| Latvia | 13 | 3 | 0 | 27 | 0 | 18 |
| Estonia | 46 | 5 | 2 | 12 | | 34 |
| Malta | | 1 | 0 | | | 25 |
| Romania | 2 | 5 | 0 | 10 | 105 | 15 |

| | | | | | | |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Bulgaria | 30 | 1 | 0 | | | 28 |
| EU27 | 60 | 36 | 20 | 21 | 52 | 42 |
| North | 67 | 45 | 36 | 23 | 63 | 51 |
| South | 43 | 14 | 4 | 16 | 38 | 29 |
| East | 35 | 8 | 0 | 18 | 25 | 21 |

Source: EC European Innovation Scoreboard (2004)

One sees that there is a clear split in the EU. The countries of the North-west show the highest values, followed by the South-west and finally the East. There is a real problem for the countries of the South. For the moment their wealth levels are higher than those of the East but their innovation potential seems to be lower than the one of the East. Moreover the countries of the East also perform better with respect to human resources and investment in equipment (Molle 2007, chapters 2-5).

Two countries are top performers in innovation, viz. Sweden and Finland. Both are high-income countries but neither is part of the North-west European metropolitan core area. The position of Sweden and Finland is due to very deliberate policy choices to step up innovation in order to stay abreast of the competition. To support these policies the two countries have adopted a new governance model whereby government science policy, university research and industry innovation operate with a great degree of synchronization.^{xvii}

3.3 National typologies

The situation in the EU as depicted in Table 1 suggests a three tier Europe. This suggestion is however the result of a superposition on the data of a certain set of characteristics. What would emerge in case we would let the data speak first and see what categories would emerge?

Most interesting would be the use of datasets concerning the different factors that determine performance as distinguished in the literature on National and Regional Innovation Systems (see Chapter 1). These factors are somewhat more varied than the ones included in Table 1. The factors and a selection of their relevant indicators include:

- Knowledge creation (indicated by e.g. the share of R&D in GDP; patents);
- Absorptive capacity (indicated e.g. by level of education, integration in information society)
- Diffusion capacity (indicated e.g. by technology diffusion infrastructure);
- Demand (indicated e.g. by GDP per capita GDP/P growth);
- Government capacity (indicated e.g. by participation in EU initiatives, E government, websites of regional governments).

In a regression and cluster analysis on 25 such indicators for the 27 EU countries Radosevic (2004)^{xviii} showed different groups for each of the five dimensions given in the bullet points above. The analysis generally confirmed the existence of the group of developed EU countries (the North West). It did however come up with different groupings than the one used in Table 1 for the other countries. Indeed among the

remaining countries two more groups emerged that are both composed of South-western and Eastern countries. The most recent data (Eurostat 2007) show again a split of the EU in two groups; above average North-west and below average South-east.

3.4 The regional picture

On the regional level the data base is less complete than on the national level. It means that we are constrained in terms of time period, area coverage and type of indicator. An study made in the early 1990s described the situation in the EU 12 as Archipelago Europe; because most R&D activities were found to be located in a limited number of islands of innovation that seemed to have strong internal links and weak links among each other and with other regions (FAST 1992). The basic situation as to concentration has not changed much since; however, the interconnections have been improved under the impetus of various EU programmes (see later sections)

There is even now some lack of consistency between the data for the OMS and the NMS. E.g. up till recently the indicator on patents (which was heavily used in scoreboards) was neither relevant nor available for the NMS. The patchy information for specific indicators tends to produce fairly disparate results. Therefore we present a comprehensive picture for the EU 15 first. It is based on an aggregate index (being the average of a set of indices of the type given in Table 1). The regions that perform best on this index are given in Table 2. Three salient features stand out that seem to determine performance:

- *EU centrality.* Half of the regions in the top 40 and six out of the top 10 are located in the Pentagon; the metropolitan North- western part of the EU. Not a single region from the periphery shows up in this top group.^{xix}
- *National centrality.* A large number of national capital cities show up in the list (in total 11, of which 6 are among the 12 regions with the highest score). Moreover there are many regions in the list that are traditionally most dynamic, such as Rhone-Alps in France, Catalonia in Spain, Prague in the Czech Republic, etc.^{xx}
- *National choices.* Many of the best performing regions are in Sweden and Finland; two countries that have over several decades not only pursued a very deliberate national innovation policy (see previous section), but have also added a regional dimension to it.

The results of the table convey *two important messages*. First, the regional differences in innovation are to a large extent determined by centrality. Second, this is no reason for despair for regions outside the central areas; a long term policy can bring such regions up to top levels of innovation performance. Indeed EU centralisation tendencies do not seem to be dominant forces (Cuervo-Cazurra and Un 2007).

Table 2 Top 40 regions (above EU average) ranked by their score on the innovation index (EU 15 =100)

| <i>Rk</i> | <i>Region</i> | | <i>Index</i> | <i>Rk</i> | <i>Region</i> | | <i>Index</i> |
|-----------|--------------------|----|--------------|-----------|---------------|----|--------------|
| 1 | Stockholm | S | 225 | 20 | Vlaams Gewest | BE | 112 |
| 2 | Uusimaa (Helsinki) | SF | 208 | 22 | Lombardia | I | 112 |
| 3 | Noord-Brabant | NL | 191 | 23 | Kärnten | A | 111 |

| | | | | | | | |
|----|----------------------------------|----|-----|----|----------------------------------|-----|-----|
| 4 | Pohjois-Suomi | SF | 161 | 23 | Région Bruxelles | BE | 111 |
| 4 | Eastern | UK | 161 | 23 | Rhone-Alpes (Lyon) | F | 111 |
| 6 | Ile de France | F | 160 | 26 | Lazio | I | 110 |
| 7 | Bayern (Munich) | D | 151 | 27 | Piemonte (Turin) | I | 109 |
| 8 | South East | UK | 150 | 27 | Zuid-Holland (Rotterdam) | NL | 109 |
| 9 | Comunidad de Madrid | E | 149 | 29 | Hessen | D | 108 |
| 10 | Baden Württemberg (Stuttgart) | D | 146 | 29 | Southern and Eastern | IRE | 108 |
| 11 | Sydsverige | S | 143 | 32 | West Midlands (Birmingham) | UK | 108 |
| 12 | Berlin | D | 140 | 33 | Groningen | NL | 107 |
| 12 | Östra Mellansverige | S | 140 | 33 | Comunidad Foral de Navarra | E | 105 |
| 14 | South West (Bristol) | UK | 147 | 33 | Noord-Holland | NL | 105 |
| 15 | Västsverige | S | 146 | 33 | Limburg | NL | 105 |
| 16 | Mid-Pyrénées (Toulouse) | F | 141 | 36 | N- West(Manchester/Liverpool) | UK | 104 |
| 17 | Wien | A | 126 | 37 | Hamburg | D | 103 |
| 18 | Etelä-Suomi | SF | 124 | 38 | Scotland | UK | 102 |
| 19 | Utrecht | NL | 123 | 39 | Cataluña (Barcelona) | E | 101 |
| 20 | Flevoland | NL | 114 | 39 | Gelderland | NL | 101 |

Source: EC (2002) (Parkinson *et al.*, 2004)

Additional recent information about the new member states for related indicators^{xxi} shows that none of their regions (but for Prague) shows up in the top 40 of the EU 27^{xxii}.

3.5 Regional typologies

The type of data used in the previous section for the establishment of the relative position of countries and regions can also be used for making *types of regions*. These can be useful for the identification of their deficiencies and potentials. Aggregate figures for such groups may also be used to define priorities of policy and on that basis attribute financial resources to each group of regions. Detailed figures can be used for specifying the priorities for intervention. This applies equally to innovation policy (for instance for the funds concerning the European Research Area) and to regional policy (for instance the share of innovation in support under Structural Funds).

Several (groups of) authors have produced such typologies. In the past, due to lack of data, they were often based on a limited sample and a qualitative judgment (e.g. Cooke *et al* 2000; ECORYS 2004). Recently better data have come available that have permitted to establish typologies based on quantitative data. We refer here to one for the old member states (OMS), one for the new member states (NMS) and one for the whole of the EU27.

For the OMS two clusters of urban regions in the North West of the EU were found (Clarysse and Muldur 2001) that showed highest scores on both innovation and economic performance. Next to these a category of regions was found that were average (notably in Spain, southern France and Italy) another category of catchers up and finally a category of laggards behind (notably in Greece, Spain, Portugal). This typology recovers on the regional level largely the notions that we have earlier found on the national level^{xxiii}.

In a statistical analysis for regions of the *NMS* (using a database that bears much resemblance to the one used for countries (section 3.3) Muller et al (2006) identified five different groups.

- Capital regions (high scores). They include all regions comprising the capital cities of the *NMS*.
- Tertiary growth potential regions (medium scores). In this group we find the Baltic states but also a region like Wielkopolski.
- Skilled manufacturing platform regions (medium scores).
- Industrially challenged regions (weak scores). This is the largest group of the set.
- Lagging behind agricultural regions (very low scores). Here we find back many of the Romanian regions.

For the EU 27 a typology has been made by the evaluators of the contribution of the EU funds to innovation and knowledge (EC 2005a). They used four sets of criteria: public knowledge, urban services, private technology and learning families. Four strategic groups were derived.

- At the top rung of the ladder appear global consolidation regions. They are well above average on all four sets of criteria. Regions in this group include the capital cities of the countries of the North-west (and Prague).
- On the bottom rungs appear many regions in Southern and Eastern Europe that have low scores. The group is largely identical with the convergence regions of the EU (see section on cohesion policy later in this chapter) and includes most of Greece, Southern Spain, most of the regions of the *NMS*. These regions are broadly speaking users not producers of technology and knowledge.
- The intermediate group is divided into two subgroups. One of them is strong in private technology (e.g. Baden Wuerttemberg), while the other is strong in public technology (e.g. Midi Pyrenees, Bratislava).

A much more detailed view of the EU 27 (provided by Dunnewijk et al 2008) shows the large variety (ten clusters or types) in regional innovation potentials. It identifies on that basis equally detailed and varied sets of benchmarks and sets of suggestions for policy.

4 Innovation

4.1 Development of EU policy ^{xxiv}

The EU has already from its very beginnings been involved in R&D policy. Central to the beginnings were the big European R&D centres that were set up in the 1950s by one of the predecessors of the present EU (Euratom) to support nuclear energy on the European level. However, the EU role stayed relatively limited up till the 1980s when European integration got a new boost. This was visible in the strengthening of the internal market programme and in the increased accent on the motors of growth; notably innovation.

The EU recognises that certain types of R&D generate macro economic benefits (positive externalities) that cannot be appropriated by those who have put up the investment. This leads to underinvestment by private sector agents (e.g. because

they find that their patents provide insufficient protection against imitators). So R&D is a public good which justifies public intervention^{xxv}. Moreover there are significant economies of scale and spill-overs that justify the involvement of the EU in some segments of R&D and technology policy. However, R&D by itself does not create competitive positions for new products by EU firms. So a more comprehensive policy was needed focussing on the stimulation of innovation.

In the 1980s a start was made with framework programmes for innovation. The Single European Act (1987) gave the new institutional framework for this change and defined clearly the role of the EU in matters of R&D and innovation. It set the broad objectives and defined the type of interventions and the mechanisms for delivery (framework programmes). Since then six framework programmes have been executed (Peterson & Sharp 1998). The new 7th Framework Programme (FP7) covers the period 2007-2013; in line with the medium term EU financial (budget) perspectives

4.2 Financial support to innovation

The total size of the budget for innovation has continuously been stepped up^{xxvi}; for the present FP7 the total size of the financial resources amounts to 53 billion euro for the seven year period from 2006 - 2013. The content of the FPs has changed over time in function of the gradual interactive development of theoretical renewal and policy experimentation (Mytelka and Smith 2002). We cannot deal with all of the aspects of the FPs and the EU innovation policy (EC 2003a) here, so we present only a few selected activities:

Support EU policy objectives. The EU traditionally finances some R&D that is executed in EU centres. These were initially limited to nuclear energy research but now they cover a much wider array of subjects. This EU activity now falls under the heading of Joint Research Centre.

Support to R&D programmes of national and private institutes. The latter apply for subsidies for projects that fall in one of the EU priority areas. Excellence is the main criterion for allotment.

Improve strategic sector R&D by stimulating cooperation. In the beginning of the century the EU has defined the European Research Area (Edler et al 2003). This stimulated the collaboration in R&D between firms in different parts of the EU and enhanced the effectiveness of their efforts (Caloghirou et al 2004).

Support investigator driven research (Ideas programme). The FP7 has introduced the European Research Council; a pan EU agency for funding research at the frontiers of science.

Improve the performance of the private sector on innovation. One bottleneck for development is the inadequate structure of finance provision for innovative firms, notably SMEs^{xxvii}. The EU facilitates networks that bring together demanders and suppliers of early stage financing (mostly fast growing SMEs). Examples are the EU initiatives such as Europe INNOVA or Pro INNO. The FP7 adds to that a new EU risk sharing facility to back private investors in research projects and to improve the access to loans from the European Investment Bank.

Improve exchange of R&D results. The ultimate success in the marketplace is not determined by the quality of the basic research but by the take up of knowledge by commercial firms. This take up is positively influenced by the quality of the institutions for innovation and technology diffusion by promoting the interaction between universities, firms and public R&D institutes (OECD 2001). The EC has

encouraged the development of so called European Technology Platforms (EC 2005b) that stimulate exchange in key technology domains. It encourages also the establishment of networks of institutions and firms that work on related technologies in different member countries. The FP7 has given a follow up to these earlier actions by the Joint Technology Initiatives that specifically address those areas of research activity where enhanced collaboration and considerable investment are essential to long term success.

4.3 Coordination of national policies

For large segments of the innovation policy the instruments are in the hands of other players than the EU. So there is an important role for the EU in matters of coordination of national policies. This covers a number of aspects of which we cite:

- *Finances.* Under the Lisbon Strategy member states have agreed to increase expenditure on R&D to 3 per cent of GDP by 2010. One third has to be financed from their own budgets, two thirds is to be private sector expenditure. The latter has to be stimulated by the public sector. The FP7 has defined in this context the ERA/NET that brings European, national and regional programmes closer together.
- *Regulation.* To stimulate private sector R&D member states have agreed to reform the elements of their regulatory frameworks that have been found to hamper private R&D. In step therewith the EU has revised certain segments of its regulation too. In 2005 e.g. the EU has changed its regime for state aid in order to facilitate innovation and R&D in firms (EC 2005a). The new rules increase the scope of allowable state aid to cover most relevant aspects of the innovation process (of course still subject to the usual safeguards).

4.4 Consistency with Cohesion

The main channel of transmission of the innovation policies to cohesion is through the EU *budget*. The EU support is done in the framework of FPs; of which the detailed projects and programmes come up for public tendering.

The selection of projects and the allocation of EU financial support to the selected innovation projects is made on criteria that are internal to innovation policy. The search for excellence means that programmes are entrusted to those organizations that are best qualified to make them into a success. These organisations are often located in the wealthy core areas of the EU. Existing regional strengths are thus a key factor in determining a regions' propensity to benefit from this type of funding (ECOTEC, 2004). So, the direct impact of the EU support to R&D is not favourable to cohesion (Sharp and Pereira 2001). Only a limited number of catching up (dynamic) regions seemed to be capable of making use of the advantages of participation in the FPs (Clarysse and Muldur 2001)^{xxviii}.

Some form of attenuation of this anti-cohesion tendency comes from the introduction in the allotment criteria of the obligation on the winning contractor to cooperate with organizations in less developed regions. This seems to have been effective as the share of the least developed areas (objective 1; convergence regions in the jargon of the EU cohesion policy) in funding was higher than their share in R&D capabilities (ECOTEC, 2004; Sharp and Pereira, 2001). However, mainly the more central regions of the least wealthy EU member countries realized this effect, which

means that all other areas were left pretty much in the cold (EC, 2004). Another point of concern was that in the “cohesion” countries and regions the participation of the private sector in particular of SMEs was almost non-existent, which implies that the chances of direct regional economic effects were limited. ^{xxix}

A new initiative that needs to be mentioned in this respect is the support that the FP7 gives to *capacity building*. It has introduced the *Regions of Knowledge* programme that brings together the various research partners within a region. Under this programme universities, R&D centres, multinational firms, SMEs and regional authorities are invited to link up with partners in their own region and in other regions (among them leading ones) to strengthen their innovation abilities and potential. Eligible actions here comprise the organisation of conferences and networks, the exchange of staff, the mentoring of R&D activities by experts from other countries, etc.

Another initiative is the capacities programme that provides finance for projects that aim at the improvement of the *research potential of convergence regions* for which some 340 million euro has been set aside for the period of the FP7. Eligible projects comprise for instance the acquisition of research equipment, the evaluation of R&D facilities in matters of quality and infrastructure, and trans-national secondments of research staff.

Regulation is another channel through which innovation policy can influence cohesion. For instance EU regulation that is intended to improve the quality of the environment leads to innovation in terms of the technologies used both for products and for production. An example of a possible positive effect on cohesion is that high standards set by the EU for the quality of air may induce the relocation of industries from developed regions (that are already under heavy pressure) to regions where there is still a margin between the actual situation and the standard. An example of a negative effect is that the new standard may trigger new technologies that are best mastered by industries in wealthy regions. Unfortunately these ramifications of the effects of policy are so diverse and so uncertain that they do rarely permit specific conclusions and never overall conclusions.

5 Cohesion policy ^{xxx}

5.1 Development of the EU policy

The EU has from its start been confronted with considerable disparities in wealth and employment between different parts of its territory. These disparities have been increased by the different enlargements. Such disparities lead to economic inefficiencies (unused resources) and social tension (political unrest over re-distributional issues). In the EU jargon; the lack of cohesion goes with a lack of productivity (and thus competitiveness).

Cohesion has no authorised definition but is often understood as the degree to which economic, social and territorial disparities are politically and socially tolerable. The EU cohesion policy has developed over the past half a century under the influence of mainly two challenges. The first is a real increase in disparities due to enlargement. The second is the risk of increased disparities due to deeper integration (e.g. EMU). The *main events that have marked the evolution of the policy* were the following:

- In the 1950s and 1960s there did not seem to be a need for an EU regional (cohesion) policy; the market integration process did not seem to have much negative impact.
- The 1970s saw the first enlargement of the EU that entailed a fear for increased imbalances. To counteract such problems the European Regional Development Fund was established, that co-financed development projects in disadvantaged regions.
- The 1980s saw the second round of enlargements with the three Mediterranean countries, which greatly increased internal EU disparities. Moreover the simultaneous programme for the completion of the internal market increased the fear for negative effects of increased competition on the weaker countries. In view of these challenges the EU changed fundamentally its position. With the single European Act of 1985 the objective of economic and social cohesion became a “constitutional” task. In step therewith the size of the Funds were considerably increased and the rules governing their use profoundly altered. The reform introduced new principles of governance such as programming, partnership, additionality, etc.
- In the present century the latest round of enlargement with the NMS of Central and Eastern Europe did increase the disparities more than ever before. Moreover, globalisation, the setting of the Lisbon targets and the introduction of the euro did introduce big new challenges. Consequently the scope of the cohesion policy (funds available, areas of intervention, strictness of regulation, etc) was considerably increased again.

The *objectives of Cohesion policy* have remained largely constant over time. The first objective is real convergence; in other words the catching up of the less well to do regions with the EU average. To that end income, employment and economic opportunities in the weaker regions need to grow faster than those in the richer areas. Other objectives (than real convergence) have also been formulated and these have changed quite a bit over time. The most important secondary objective is now the improvement of competitiveness in the stronger regions (with a clear reference to the Lisbon strategy; see e.g. EC 2003b).

5.2 Financial instruments

The major instruments of cohesion policy are the Structural Funds and the Cohesion Fund. Essential in their operations is the rule of co financing; it means that the EU subsidises projects from regions and countries. The EU support is higher the lower the level of wealth in the area in question. Eligible are projects that strengthen the competitive basis (“structure”) of the region in question. Most of the resources are devoted to projects in countries with levels of wealth considerably below the EU average.

Every six to seven years the SF are evaluated and adapted to new needs. The latest changes have been made in 2006. They comprised the re-allotment of the available money over the various objectives. New guidelines have been issued as to the set up of programmes and the priority areas of interventions. These imply the putting of a major part of the resources of the SCFs at the service of the Lisbon Strategy in general and of innovation policy in particular. Under the new rules the main goal is convergence, which implies the support to projects that are instrumental in the catching up of the least favoured areas to the EU average. Most expenditure

(more than three quarters) is concentrated on this goal. The second objective is competitiveness of the whole EU. All non “convergence” areas in the EU can apply for SCF support for projects that stimulate their competitiveness.

The six main sectors of expenditure are: productive environment, infrastructure, environment, R&D and human resources. These cover to a large extent the various primary objectives and subsidiary goals of the Lisbon strategy. Examples are for instance the support of the European Social Fund for retraining of workers to make them better adapted to the knowledge society. In the past a major part of the SCF resources was devoted to infrastructure. As in the major beneficiary countries (notably the new member states) there is still a big need for improvement of infrastructure this category is still important. Consequently a relatively modest part of the total resources of the SCF directed to these countries is directly relevant to innovation and knowledge.

For the present programming period the resources earmarked for priority action 1: “Investing more in Knowledge and Innovation” amount to some 83 billion (out of total resources for cohesion of about 350 billion). Some half of this amount is devoted to innovative capacity in business; the other half is shared by support to the diffusion and use of ICT by business and citizens and the development of skills. These figures represent a very considerable increase to the previous planning period: a doubling for the convergence objective and a tripling for the competitiveness objective.

5.3 Regulation; Coordination with national and regional policies

The second important instrument of cohesion policy is regulation and coordination. In the past much of the cohesion policy has been done through fairly light forms of coordination. However, gradually the EU has had recourse to ever more strict forms of regulation. We will give here some practical examples.

In order to preserve the effectiveness of financial support to projects in convergence regions the EU has set limits to national state aids. Indeed the financial capacity of the strong regions is so large that they could easily outbid any offer in the convergence regions. The EU moreover sets standards, for instance for the maintenance of the environmental quality. This may put an extra burden on convergence regions for which extra support may be granted.

The EU moreover coordinates the *regional policies of the member states*. It has set up very detailed regulations that govern the following three aspects;

1. Choice of priorities. National choices are systematically aligned with EU objectives in matters of cohesion. The scope of the cohesion policy means that it takes often also on board the coordination of other policy fields, e.g. the improvement of the environment, of the social fabric, etc.
2. Multi annual programming. This approach brings predictability in the availability of resources and stability as to their orientation.
3. Establishment of partnership. The involvement of different layers of multi level government and third (private) parties brings commitment of all parties involved to the efforts needed to reach common goals.

5.4 Consistency with innovation

With the reform of the structural funds in 1988 innovation became one of the main areas of activity of the EU CP^{xxxii}. In the period up to 1999 the share of these activities

in total SCFs was about 4%, so very limited. However, when added to the FPs the sums are significant for many of the beneficiary countries. In the last and present frameworks the share of the innovation projects in total funding has increased gradually. In the 2000-2006 period the SCFs made a significant contribution to achieving the Lisbon objectives (DTI 2005). Notably programmes with a strong focus on regional competitiveness and innovation were strongly aligned with the Lisbon Strategy; much less so were programmes focusing on physical infrastructure.

Based on the 2005 Growth and Jobs Agenda, the member states have been encouraged to concentrate their efforts under the cohesion policy on Lisbon strategy priorities. The Community Strategic Guidelines prepared by the Commission as a guiding document for the new programming period 2007-2013 fully recognised the importance of the Lisbon Agenda and set high ambitions concerning the contribution that the Structural Funds are expected to play – especially so in the context of the Objective 2 Regional Competitiveness programmes. The earmarking of Structural Funds actions – formally introduced in the Implementation Guidelines issued in 2006 - is a potentially powerful instrument to check conformity with the Lisbon goals. On the basis of a preliminary analysis of the national programmes one sees that some 65% (Objective 1 convergence) to 80% (Objective 2 competitiveness) of the Structural Funds interventions are now expected to directly contribute to the Lisbon targets. Innovation expenditure has been much enhanced; it will triple in the period 2007-2013 with respect to the previous period. This increase is even more pronounced in the new member states (EC 2007d)

6 How much consistency?

6.1 General

Each of the two main policy domains under scrutiny here has its own rationale, set of objectives, toolbox of instruments and way of governance. These specificities are often strongly entrenched and are defended by communities of directly interested parties, lobbyists, etc. The pursuit of such independent policies may lead to conflicts (e.g. between infrastructural development and the environment). The persistence of such conflicts will lead to a loss of effectiveness and efficiency, so a waste of resources.

Such conflicts are in general solved by coordination. Part of the coordination problem is horizontal. The EU has recognised that its policies are often conflicting (see the example given in section 9.2.5). The EU has set itself the task to realise a strong alignment of its different policies. This has even been cast in a constitutional obligation^{xxxii}.

In the early years of the EU the coordination problem was fairly simple. Over time it has gradually become more complicated as a consequence of several factors. First the number of competences has greatly increased. Second the targets have become more detailed. Third the instruments have become stricter (as far as regulation is concerned and as far as financial support is concerned, see Molle2006). In step therewith the coordination of the EU has increased. This is notably done through meetings between representatives of different Directorates General. These face two challenges:

- optimize the horizontal system of coordination on the EU level (that is between different European policy areas)^{xxxiii}.

- match the vertical systems of coordination that co-exist for innovation and cohesion (and that comprise on the national and regional level horizontal coordination tasks);

More coordination is supposed to bring higher effectiveness as resources are put to work in a synergetic manner. In clear terms it avoids unnecessary efforts and hence the waste of resources. However it comes at a cost; more coordination brings with a higher transaction cost so a potential loss of efficiency. It can even entail a loss of effectiveness in case coordination leads to the choice of suboptimal priorities and or political and administrative stalemates.

So one need to see in practice in how far the benefits outweigh the cost. To that end we analyse three stages of the policy cycle, viz. the setting of objectives, the implementation and the evaluation of results.

6.1 Objectives

On the level of the objectives there is often the assumption that there is not a big need for coordination. Indeed, *“there is often the temptation to argue, especially in official documents, that different policy objectives are not in conflict with each other, that a more equitable distribution of income is beneficial to long-run efficiency, and that boosting the efficiency of production is the best protection for the economically vulnerable”* (Hall et al 2001, p 356).

The quotation seems to apply very much to our problem at hand. The efforts done in the framework of the EU innovation policy are meant to boost competitiveness of the EU in the key sectors for the knowledge society. The activities carried out in the framework of the EU cohesion policy, although principally geared to equity, take the increase in the competitiveness of the catching up (“convergence”) regions as their main point of attack. Moreover the support that can be given to the non “convergence” regions is all geared to measures to increase competitiveness.

So, *on the level of objectives consistency does indeed exist*. On one hand the importance of the regional (cohesion) objective has become centre stage in the implementation of the Lisbon strategy (including innovation policy). On the other hand the innovation objective has moved centre stage in cohesion policy since the recent reform of the SCF.

6.3 Implementation

Even if there is no conflict on the level of broad objectives there may be conflicts in the stage of implementation. An example of the last seems to be the overlap that occurs because EU innovation policy has started to finance programmes with a cohesion objective while EU cohesion policy is effectively the largest source of finance for innovation projects.

More problems occur because innovation and cohesion follow different trajectories in the EU policy cycle and are implemented with different systems of governance.

Innovation. The EU sets goals and specifies these. It has mainly two instruments.

- *EU programmes*. For these a typical European network of large firms, top R&D organisations, experts and representatives of national administrations

influence both the setting of priority fields, the monitoring of implementation and the evaluation of results.

- *National programmes.* In this case the EU contributes to the financing and relies for the rest on soft coordination measures, such as the checking of progress by monitoring systems, the exchange of information and the suggestion of improvements. The EU leaves it to the member states to involve partners. In the Lisbon process this operates through National Reform Programmes (NRP). This makes that in each country different constituencies have evolved of interested firms, R&D organisations, intermediary bodies and the relevant representatives of the most important ministry. The EU innovation policy recognises that much of the effort should go beyond the improvement of the national innovation systems into the regional innovation systems. However, it leaves it almost entirely to the member states to further involve regions into the process. The absence of hierarchical powers and the limited financial incentives make that the achievement of common goals is subject to much uncertainty.

Cohesion. Right from the start of the cohesion policies the national dimension has been thought as being too broad to serve as a basis for the identification of problems and potentials and the formulation of remedies and development strategies. On the regional level however one can provide the flexibility and variety needed. Since its inception the regional dimension of cohesion policy has never been seriously challenged. The SCF recognise the diversity of the growth potentials of the different regions and the ensuing need for differences in prioritisation of actions. In the course of time the introduction of new principles has improved the governance methods.

- the application of the principle of programming ensures that national and EU frameworks and guidelines give coherence to concrete actions. This is materialised in the National Strategic Reference Frameworks that each member state has to establish.
- Moreover the additionality principle provides that the strong financial incentive of subsidies from the SCF joins finances from the project initiators, which leads to compliance with common goals.
- The principle of partnership means that there is a strong emphasis on the involvement of the various actors in the multi level system; the filling in of their roles is largely predefined by detailed regulations.

So, one sees that in the multi layer EU governance system both the script of the play and the distribution of roles has developed largely independently for innovation and cohesion. Each policy area follows certain principles (e.g. subsidiarity, partnership and programming) but the way in which they are applied differs for innovation and cohesion. This brings with it the danger of a lack of consistency.

6.4 Evaluation of coordination

According to many observers the EU has had difficulties to come to grips with the complicated problems that occur while trying to coordinate both horizontally and vertically a set of different policies. This need not surprise if one sees the practical difficulties that already occur if coordination is only to be done horizontally (that is on the EU level between different DGs or on the national level between different

ministries). Similar difficulties occur vertically when different administrative levels have to come to a consistent design and delivery of policies.

As far as the two policy areas we deal with here are concerned there are indeed potential conflicts between the largely top down approach of the innovation policy (RTD>innovation> region) and the largely bottom up approach of cohesion (region>Innovation>RTD).

In the recent reform of the Structural Funds and the Lisbon strategy reinforced coordination mechanisms have been introduced, that have taken away at the strategic level much of the dangers of inconsistencies. Indeed, in all member states close links have been established at the process level between on one hand the NRP (Lisbon) and on the other hand the NSRF (cohesion). All member states have started to organise cooperation between those responsible for both policies and many have adapted their administrative structures to improve consistency. This is not a one off exercise; all member states have to report regularly to the EU on the way they coordinate the two policies in practice. This should take away much of the inconsistency danger. However, the new model has only just been introduced and it is too early to judge its effectiveness.

7 Conclusions and recommendations

7.1 Past results and future challenges.

The previous sections have made clear that over the years the EU has set up very elaborate systems of vertical coordination for its different policies. It has constantly adapted them to new needs. One of these new needs is to coordinate better on the horizontal level its cohesion and innovation policies. The decision that has been taken is to adapt the basic system of cohesion policy design and delivery to suit also the needs of innovation. Although in theory this integrated set up looks quite distorted in practice it may prove to be workable. One has to wait for an evaluation of the implementation to draw firm conclusions.

Now, whatever the adequacy of the coordination mechanisms at present, the future may pose challenges that may require further adaptation of the coordination systems. So let us see what these challenges are.

The major challenge in matters of *cohesion* is to realise the convergence of the wealth levels of the NMS. The basic set up is adequate for this task. There does not seem to be a need for more extended horizontal coordination. Indeed, the policies in which the EU is likely to have a stronger involvement (such as energy, environment, etc.) do seem to fit into the (extended) present set up. So there will be a need for the optimisation of the present set up of rather than a major overhaul of the system (Molle2007).

For innovation the challenge is to make sure that the combined systems on the European, national and regional level work together in a consistent way so as to provide the necessary stimuli for innovation and for the commercial use of innovation. These are essential prerequisites for success on the innovation part of the Lisbon agenda, that will keep its relevance for the decades to come. .

Consequently the recommendations may be set in terms of further improvement of parts of the system instead of a complete overhaul of the EU policy system. These are of two types.

7.2 Minimize the need for coordination

Let us remind that one can minimize the role of coordination by making clear rules for the way in which one treats certain areas.

The first approach is about *horizontal coordination*. Here one can decrease the need for coordination through the *prioritization of objectives*. In the EU this can be illustrated with two cases; monetary policy and internal market policy. These policies are pursued on their own merits and they have priority over others. In case they have a negative effect on cohesion the efforts of the cohesion policy have to be stepped up. In certain segments this applies also for innovation: those R&D projects that after applying the subsidiarity principle come clearly under the EU competences have to be carried out on their own merits and any negative consequences for cohesion policy have then be addressed by cohesion policy. A good example here are the investments made in specialised R&D centres that tend to search for central locations. It need be questioned whether in those cases R&D policy needs to make up for such consequences by setting up a programme for regional innovativeness. The setting up of a parallel system (to the one of cohesion) adds only to the coordination problem instead of diminishing it.

The second approach is about vertical coordination. Here the need for coordination can be limited by the *explicit splitting of objectives and implementation*. Once it has been made clear that on the level of strategic objectives there is no conflict, one may decide that the elaboration in concrete actions and the delivery of the policy can be left to decentralised actors who can adapt the generalities to local circumstances and needs. The independent operations may create from time to time some overlap and competition, but the cost thereof are likely to be smaller than those of detailed coordination that may lead to long procedures and low effectiveness. This may apply to such policies as the enhancement of entrepreneurship, SME development and the strengthening of the absorptive capacity of both the private and the public sectors.

7.3 Optimize the use of coordination

Where approaches to limit the need for coordination have been exhausted a strong need can remain for combined horizontal and vertical coordination system. Then it is important to make sure that the system works as smoothly as possible. One way to realise this is by keeping the number of actors within reasonable limits. At first sight the main actors are the same in both innovation and cohesion policies. However, on closer look one sees that the representatives at the three levels of hierarchy are different.

Coordination between the EU and national governments is needed to come to a consistent approach that brings results. However, on many scores this does not seem to be sufficient. It is not only at the national level, but also at the level of the region that many of the factors of competitiveness and innovation can be identified and effective tools for sustainable, endogenous development applied.

As the problems and their solutions have essentially a regional dimension it comes to mind that the relevant policies of the LS also need to have a stronger regional dimension next to the national and the European dimensions. This leads to an extension of the multi-level governance (MLG) approach that integrates the three levels. This system then rejoins the cohesion (SCF) approach.

Now regions differ widely in their competences (function of the extent of decentralisation or devolution of political and administrative powers from the national to the regional level. Various models exist in that respect throughout the EU. Some national governments have involved their regions in the developing of their NRPs.

For the Lisbon Strategy in general and innovation in particular to be delivered successfully at the regional level, the heterogenous nature of regions must be recognized. This flexible approach is not only dependent on having differentiated regional strategies and programmes but also having the appropriate regional administrative and governance systems that can interact with the appropriate institutions and policies at the national and European levels. It is then at this level that most of the effort for consistency need to be done and where the different administrative and political agendas and governance methods need to be aligned. A number of regions have indeed already been empowered in matters of innovation. In Italy and Spain for instance universities and R&D have become a competence of the regions. In France and the Netherlands the central government has recognised that it cannot deliver from the centre its policy and has decided to do this through regional poles.

7.8 References

- Aho, E et al. (2006), Creating an innovative Europe; Report of an independent expert group on R&D and innovation appointed followed the Hampton Court Summit, EC, Brussels
- Bloom, N. R. Griffith and J. Van Reenen (2002), Do R&D tax credits work? Evidence for a panel of countries, 1979-1997, *Journal of Public Economics*, 85, 1-31
- Caloghirou, Y., N.S. Vonortas and S. Ioannides (eds) (2004), European collaboration in Research and Development: Business strategy and public policy, Edward Elgar, Cheltenham
- CE/ECORYS et al. (2003), 'Factors of Regional Competitiveness', study commissioned by DG Regio.
- Clarysse, B. and U. Muldur (2001), Regional cohesion in Europe An analysis of how EU public RTD support influences the techno economic regional landscape, *Research Policy*, 30, 275/296
- Cooke, Ph, P. Boekholt and F. Toedling (eds) (2000), The governance of innovation in Europe; Regional perspectives on global competitiveness, Pinter, London and New York
- Cuervo-Cazurra, A. and C.A. Un (2007), Regional economic integration and R&D investment, *Research Policy*, 36.2, 227-46
- Dunnewijk, T., H. Hollanders and R. Wintjes (2008), Benchmarking regions in the enlarged Europe; Diversity in knowledge potential, and policy options, in: C. Nauwelaers and R. Wintjes (eds) Innovation policy in Europe; measurement and strategy, Edward Elgar, Cheltenham, pp. 53-95
- DTI (2005) Thematic evaluation of the Structural Funds' contributions to the Lisbon strategy; Synthesis report, Danish Technological Institute, Copenhagen
- EC (2000) Communication from the Commission, Structural Indicators, COM2002 551 final
- EC (2003a) Innovation Policy; updating the Unions approach in the context of the Lisbon Strategy; COM 2003; 112 final
- EC (2003b)(DG Regio) 'Structural policies and European territories: Competitiveness, sustainable development and cohesion in Europe – From Lisbon to Gothenburg. Brussels.
- EC (2004) A new partnership for cohesion; convergence; competitiveness; cooperation, Third report on economic and social cohesion, Brussels
- EC (2005a) Implementing the Community Lisbon programme: More research and innovation-investing for growth and employment; a common approach, Brussels
- EC (2005b) Report to the European Council on European Technology Platforms and Joint Technology initiatives; Fostering public private partnerships to boost Europe's industrial competitiveness, SEC (2005) 800, Brussels
- EC (2005c) Communication on state aid for innovation, COM 2005/436, Brussels
- EC (2007a) Competitive European Regions through research and innovation.; a contribution to more growth and more and better jobs; Com (2007) 474 final Brussels
- EC (2007b) RTD, Innovation, cohesion and rural development policies; reinforced synergies (accompanying document to EC 2007a), SEC 2007 1045, Brussels
- EC (2007c) CREST Guidelines on coordinating the Framework Programme and the Structural Funds to support Research and Development, Cordis Library, Brussels

EC (2007d) Cohesion policy set to give major boost to Lisbon strategy for 2007-2013, IP/07/1904; available from EU website.

ECOTEC (2004) The territorial impact of EU research and development policies (available from the ESPON website www.espon.lu/project 2.1.2), Luxembourg

ECORYS (2004) The regional dimension, Rotterdam

Edler, J., S. Kuhlmann and M. Behrens (2003), Changing governance of Research and Technology policy: the European Research Area, Edward Elgar, Cheltenham

EP (2006) Synergies between the EU 7th Research Framework programme, the competitiveness and innovation framework programme and the Structural Funds (European Parliament document IP/A/ITRE/FWC/2006-87/LOT3/C1)

Etzkowitz, H. and Leydesdorff, L. (1997), Universities in the Global knowledge Economy, London, Pinter

Eurab (2007) Energizing Europe's knowledge triangle of research, education and innovation through the Structural Funds, European Research Advisory Board, final report 07.010, Brussels

Eurostat (2007) Community Innovation Statistics; CIS 4/EIS2006, Statistics in focus, 116/2007, Luxembourg

FAST (1992) Archipelago Europe; Islands of Innovation, Prospective dossier no 1 of Science, Technology and Social Economic Cohesion in the Community, EC, Brussels

Furman, J., M.E. Porter and S. Stern (2002), The determinants of national innovative capacity, Research Policy, 31, 899-933

Griffith, R. (2000), How important is business R&D for economic growth and should the government subsidise it? Briefing Note, no 12, The Institute for Fiscal Studies, London

Guerrero, D. C. and Seró, M.A. (1997), Spatial Distribution of Patents in Spain: Determining Factors and Consequences on Regional Development, Regional Studies, 31.4: 381-90

Hall, R. A. Smith and L. Tsoukalis (eds) (2001), Competitiveness and cohesion in EU policies, Oxford, OUP

Hollanders, H. and Rundel, A. (2004), European Innovation Scoreboard, Methodology Report, EC DG Enterprise, Brussels

Landabaso, M. et al (1997), The promotion of innovation in regional policy, Entrepreneurship and Regional Development, 9, 1-24

Molle, W. (1983), Technological change and regional development in Europe (Theory, Empiric, Policy), Papers and Proceedings of the Regional Science Association 23-38

Molle, W. (1984), Regional Innovation Potentials in the European Community in: R. Camagni, R. Cappellin e G. Garofoli (eds.), Cambiamento Tecnologico e Diffusione Territoriale, Franco Angeli ed. Milano, 109-130

Molle, W (1985a), Technology and regional development in the European Community, in: Kotsopoulos, K.C. Phebus and P. Nijkamp (eds), Regional Development in the Mediterranean, Athens, 35-51

Molle, W. (1985b), Technology, trade, and differential growth in the European Community, in: R. Cappellin and P. Nijkamp (eds), The spatial context of technological development, Avebury, Aldershot, 395-413

Molle, W. (1985c), (ed) Innovatie en Regio, Staatsuitgeverij, 's-Gravenhage

Molle, W. (2006), Economics of European Integration; theory, practice, policy, (5th ed.) Aldershot, Ashgate

Molle, W. (2007), European Cohesion Policy, Routledge, London

Muller, E., Jappe, A., Heraud, J-A. and A. Zanker (2006), A regional typology of innovation capacities in the New Member States and the Accession countries, Working papers Firms and Regions, no R1/2006, FISIR, Karlsruhe

Mytelka, L.K. and K. Smith (2002), Policy learning and innovation theory; an interactive and co-evolving process, Research Policy, 31, 1467-79

Nauwelaers, C. and R. Wintjes (eds) (2008), Innovation policy in Europe: measurement and strategy, Edward Elgar, Cheltenham

OECD (2001) The New Economy; beyond the hype, OECD Paris

Paci, R. and Usai, S. (2000), Technological enclaves and industrial districts; an analysis of the regional distribution of innovative activity in Europe, Regional Studies, 34.2: 97-114

Parkinson, M et al. (2004), Competitive European Cities: Where Do the Core Cities Stand, Report to ODPM, John Moores University, Liverpool (also Office of Deputy Prime Minister London)

Patel, P. and K. Pavitt (1987), Is Europe losing the technological race, Research Policy,

Peterson, J. and M. Sharp (1998), Technology policy in the European Union, Macmillan, Houndsmill/Basingstoke

Radovic, S. and L. Auriol (1999), Patterns of restructuring in research, development and innovation activities in central and eastern European countries an analysis based on S&T indicators, Research Policy, 28, 351/376

Radosevic, S. (2004), A two tier or multi tier Europe? Assessing the innovation capacities of Central and East European countries in the enlarged EU, Journal of Common Market Studies, 42.2, 641-66

Scil (2005) Policy guidelines for regions falling under the new regional competitiveness and employment objective for the 2007-2013 period in the fields of the knowledge economy and the environment, inline with the Lisbon and Gothenburg objectives, Brussels

Sharp, M. and Pereira, T.S. (2001) Research and Technological development, in: Hall, R., Smith, A. and Tsoukalis, L. (eds) (2001), Competitiveness and cohesion in EU policies, Oxford University Press, Oxford, 147-78

Vicente, M.R. and Lopez, A.J. (2006), Patterns of ICT diffusion across the European Union, Economic Letters, 93: 45-51

Notes

ⁱ The author is indebted to several persons who contributed to this chapter. Thanks go to both Rene Wintjes of Merit and Ronald Hall of the European Commission for their useful suggestions for complementing the draft text. Thanks also to Roderick van 't Hoff for assistance in the research for literature and data.

ⁱⁱ This paper will be published as chapter 7 in: Willem Molle and Julia Djarova (eds) (2008) *Enhancing the effectiveness of innovation policy; new roles for key players*, Edward Elgar, Cheltenham

ⁱⁱⁱ For an historical view (the period 1963/1983) of the situation and the policy response, see Patel and Pavitt (1987).

^{iv} This description is based on the presidency conclusions of the European Council, March 2000. These objectives and priorities have been adapted and refined since. However the main architecture is still valid.

^v See for evidence of the importance of this relation the study by the OECD (2001) into the long term determinants of growth and competitiveness. See for further evidence also: Bloom et al (2002) and Furman et al (2002).

^{vi} Innovation policy as used here comprises the initiatives of public authorities in matters of scientific research, technological development, education and modernisation of industry and services.

^{vii} See e.g. EC 2003a. Mind that the order does not indicate any priority. Independent advisors have added to the discussion and the refinement of targets; e.g. Aho et al (2006).

^{viii} The comprehensive set is available from Eurostat's website:

<http://europa.eu.int/comm/eurostat/Public/datashop/print-product/EN?catalogue=Eurostat&product=struct-EN&mode=download>. See also EC (2005c).

^{ix} The link between cohesion and innovation has already a long history. After the two oil crises of the 1970s it became increasingly clear that a new paradigms for development was needed. The role of technology and innovation in development emerged as such and in the 1980s national policies became based on it. The same new ideas were also applied to the problem of regional development. In the framework of the FAST (Forecasting and Assessment of Science and Technology) programme of the EC we carried out the PRESTO project (Prospects of Regional Employment and Scanning of Technology Options). A number of publications ensued from that project of which we mention here Molle (1983, 1984 and 1985 a,b,c). The aspect of innovation has since been part and parcel of regional policies.

^x In the preparation process of this major change a number of documents have been written by both advisors and the European Commission that are worth while mentioning. These are: EC (2007a,b,c); Eurab (2007), EP (2006); all available from

<http://ec.europa.eu/research/index.cfm?pg=newsalert&lg=en&year=2007&na-100907>

^{xi} Actually there are other policies that form part of this coordination process. It is first the Competitiveness and Innovation Policy (CIP) targeting notably the corporate sector of the EU. Second the rural development policy. We have no place here to deal with those policies in detail here.

^{xii} This does not imply a atomisation of the efforts of all segments of RTD policy; some elements notably Research need strong centres of excellence that have specific location requirements and cannot be located in any region of the EU.

^{xiii} See; Hollanders and Rundel (2004) and also

http://trendchart.cordis.lu/scoreboards/scoreboard2003/pdf/eis_2003_tp1_indicators_definitions.pdf

^{xiv} These results are confirmed by the results of an analysis based on a pan EU household survey into the determinants of the adoption of two Information and Communication Technologies (ICT) items; the Internet and computers. Positive influences came from the level of income, access to university education, and link to R&D activities. Unemployment did have a negative influence (Vicente and Lopez, 2006).

^{xv} For example assume that the lowest and observed values for business R&D are 0.5 per cent and 2.5 per cent and that country x has a score of 1.5 per cent. The rescaled score for country x is 50, which is equal to its position halfway between the lowest and highest observed values. Each rescaled score for an individual indicator is then multiplied by the weight assigned to that indicator to come to the Summary Innovation Index.

-
- ^{xvi} East is composed of the 8 New Member States of Central and Eastern Europe. South West are the Mediterranean countries (Por, Sp, It, Gr, Ma, Cy); North west are the remaining member countries
- ^{xvii} These approaches to the problem have been labelled the Triple Helix Model (Etkowitz and Leydesdorff 1997). Now some ten years later the Nordic countries are set to step up even their efforts in this field (see several government documents) to face the challenges of global competition.
- ^{xviii} This pattern is the result of a very intricate pattern of change and restructuring following the change over of these countries from a command to a market economy (see e.g. Radovic and Auriol 1999). many of the
- ^{xix} This picture has also been found by studies for one specific indicator; for instance (Paci and Usai 2000) showed that patent production is concentrated in the regions that have the highest scores on centrality.
- ^{xx} These figures are corroborated by the analysis for Spain. Here the regional distribution of innovation activity, measured by the generation of patent applications, was particularly concentrated on the traditionally more dynamic regions (Guerrero and Seró, 1997). The public funding for supporting innovation was also concentrated in the provinces with these concentrations of applications. So the authors concluded that: ‘The search for efficiency through technological policy brings about a vicious circle which goes against technological convergence’.
- ^{xxi} See various issues of the Science and technology series of Eurostat e.g. on S&T labour force, patents, etc.
- ^{xxii} In some recent benchmarking activities the region of Prague emerges with a fairly high position (see for instance the Lisbon monitoring platform of the Committee of Regions (<http://lisbon.cor.europa.eu/>) or Strategic Evaluation on innovation and the knowledge based economy in relation to the structural and cohesion funds for the programming period 2007-2013: http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/strategic_innov.pdf)
- ^{xxiii} A similar analysis grouped the regions by crossing their economic performance and their innovation profiles (Scil 2005). The following types emerged:
- The low performers were in general characterised by a low profile in innovation. The same relation existed for many high performers as they were generally characterised by high profiles.
 - A number of high performers recorded however low or medium profiles in innovation. This mismatch is seen as an early warning for a change in the future (for instance in case the path dependent nature of development is reversed by external shocks). This concerned regions in countries such as Italy, France and the UK.
- ^{xxiv} See for a good description of the EU innovation policy: Nauwelaers and Wintjes (2008).
- ^{xxv} See in this respect the survey of the empirical literature made by Griffith (2000).
- ^{xxvi} Notwithstanding the significant amounts in terms of total outlays the EU spending on R&D is only a small (less than 10 %) of the R&D funding by member governments.
- ^{xxvii} See in this respect chapter 2 of the present book.
- ^{xxviii} In the past some of the EU innovation policies did actually benefit mostly the strong regions, so worked out negatively for cohesion as they did not contribute to the balanced growth of all regions of the EU. At present most of the EU policies (including those for innovation) tend to be devised in such a way that the impact on the cohesion is either neutral or even positive (see Molle 2007, chapter 11). One need to keep in mind that even the fairly small amounts that go to the NMS under the FP represent a considerable increase in their budget and have a relatively large influence on their policies. Anyway one can question the justification of this approach as other, more contextually embedded research priorities could have led to more impact on the innovation performance of the NMS.
- ^{xxix} This impact is attenuated by the spending on innovation that comes from other sources such as the Structural Funds and national funds.
- ^{xxx} This section is based on Molle (2007)
- ^{xxxi} In 1993 for instance an initiative called Regional Technology Plans was introduced (Landabaso et al 1997).
- ^{xxxii} *By stating and developing Community policies and activities and developing the internal market (cohesion) objectives shall be considered, participating in their achievement (art 159).*
- ^{xxxiii} *The horizontal coordination problem* on the EU level extends beyond the couple innovation and cohesion. Major problems exist on the interfaces with competition (what support to firms on either the title of innovation or convergence would distort the fair competition on the common market?). The same is true for environment; what regulation will stimulate innovation that leads to both less polluting products and to production processes that

prefer locations in cohesion regions? Important other interfaces exist also for each of the two policy areas that are the focus of this chapter. For instance; innovation policy interferes with sectoral policies; notably for the larger R&D programmes. Another example is external policy; what firms and institutions are eligible for EU support; is this coherent with the rules of international organisations on e.g. intellectual property and fair trade?