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Cohesion policy at the interface
between regional development and
the promotion of innovation

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Contents   Page

Tables

Abstract

Taking the implications of the cohesion policy framework for innovation governance as a starting point, it is the objective of this paper to discuss challenges for regional policy making with regard to a policy mix that is new to regional policy makers. Based on two German regions representing convergence and competitive and employment regions it will be discussed how regional policy makers can deal with this new policy approach and what could be appropriate strategies, programmes and learning tools. What can be seen from both the Bavarian and the Saxon case study is that the two regions apply a broad mix of different innovation policy measures, supporting all innovation policy tasks with relevance to regional development. In both regions innovation policy is not a new task, but Saxony as well as Bavaria can look back to a quite long tradition in the implementation of this policy. Differences exist with regard to policy learning in a way that due the longer innovation policy experiences of Bavaria more sophisticated structures and activities can be found in this federal state.[1]

1   Introduction

What we observe today is a trend from classic policy approaches in regional development towards a stronger orientation towards the role innovation could play for regional economic development. This tendency is obvious in the new cohesion policy outlines of the 7th Framework Programme (European Commission, 2007a). Although the European Commission points out that the reduction of social and income disparities in Europe is still among the top priorities, it is also argued that the strengthening of regional competitiveness in a globalized world demands new concepts. One of these concepts - which are foreseen to contribute to the Lisbon strategy as well - is to strengthen knowledge generation and innovation in the European regions. EUR 85 billion out of the total structural funds budget of EUR 347 billion is allocated to investments in knowledge and innovation. Nearly EUR 50 billion should be invested in the improvement of innovative capacities in the business sector, in supporting technology transfer and cooperation networks, and in R&D and eco-innovation (ibid, p. 7).

The starting point for this policy shift is the fact that Europe still faces an innovation deficit compared to major competitors like the US and Japan (European Commission, 2000, p.4) and that divergence and disparities between the European regions did not

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decrease, but increased in recent years due to the enlargement of the European Union (European Commission, 2007b, p. x-xi; Geppert and Stephan, 2008; Lammers, 2007). An answer to these problems could be the orientation on existing strengths according to regional potentials and a broad strategy stimulation innovation and economic development at different scales. Within this strategy of "regions delivering innovation through cohesion policy", learning and networking plays a fundamental role (European Commission, 2007c)

Although a distinction is made between "convergence regions" and "competitive and employment regions" (European Commission, 2007d, pp.13-19), it should be noted that even "competitive and employment regions" are not uniform, but display different characteristics. This is related to possibilities of unlocking innovative potentials, but also to the abilities of regional governments and stakeholders to deal with innovation policy issues. It is important to note that a policy aiming to support innovative activities is different from classical regional policy. It demands specific competences at the regional level in addition to competences in regional policy (e.g. with regard to RTDI, entrepreneurship, innovative ICT and human resources as new activities in the 7th Framework Programme). As innovation itself, innovation policy is uncertain and sometimes risky. It deals with research (which is often an open process), the support of spin-offs (whose success is difficult to predict), and the support of networks and clusters as a multi-actor multi-measure activity which remains only in parts under the control of policy makers. Innovation policy is therefore characterised by a high degree of anticipation and experimentalism and different from regional policy which, with its classical tools of subsidies and infrastructure investments, is much more easily to handle.

For regions, but also for coordinating authorities in a multi-level political fabric between the European Commission, national ministries and regional governments, the innovation orientation in regional cohesion policy poses several challenges. Important challenges are:

- the complex policy mix and processes influencing regional development which are only in part in the hand of regional authorities or even national authorities (Uyarra, 2007);

- the administrative structures at the regional level which often do not reflect the necessity for interdepartmental collaboration in innovation policy implementation (Uyarra et al., 2007);

- the competencies with regard to the existence of an appropriate "absorptive capacity" (strategic intelligence; cf. Kuhlmann, 2002, p.17) and budget responsibilities;

- the planning, formulation, implementation, administration and evaluation of innovation programmes which fit to the specifics of the region and which are able to reach the intended objectives (Pellegrin, 2007).

Taking the implications of the cohesion policy framework for innovation governance as a starting point, it is the objective of this paper to discuss for two German case studies representing a convergence and a competitive and employment region how regions can deal with new policy strategies and the policy mix resulting from the integration of innovation objectives in cohesion policy. Additionally, the question regarding appropriate strategies for policy learning and the acquisition of knowledge and experiences in policy making should also be addressed.

2   Policy and regional context

2.1   Cohesion policy framework

Since 2007 with the start of the 7th European Framework Programme, European cohesion policy has been attributed a central role in the delivery of the EU's growth and job agenda. Cohesion policy became part of the Lisbon agenda in a way that the Community Strategic Guidelines on Cohesion (CSG) are consistent with the Lisbon Integrated Guidelines. In this context, three major objectives are pursued (European Commission, 2007a):

- Make Europe and its regions more attractive places to invest and work.

- Encourage innovation, entrepreneurship and the growth of the knowledge economy.

- Create more and better jobs.

The total budget for cohesion policy which is available for the period 2007 - 2013 amounts to EUR 347 billion, complemented by national co-financing of about EUR 160 billion.

Derived from the three objectives and with regard to the former objective 1 and 2 classification of regions, cohesion policy is now directed towards convergence regions (all regions in Eastern Europe, parts of East Germany, Southern Italy, most parts of Greece, South and Northwest of Spain, most parts of Portugal, parts of Wales and Southwest of England with an average gross domestic product of less than 75 % of the Community average) and competitive and employment regions "RCE" (remaining parts of the European Union except the phasing-out convergence regions and the phasing-in competitive and employment regions). With regard to the total structural funds budget, 81.5 per cent is allocated to the convergence objective, 16 per cent to the regional

competitive and employment objective and around 2.5 per cent to European territorial cooperation (European Commission, 2007d, p. 24).

In consequence of the merger of cohesion policy with the Lisbon agenda, a much stronger focus on knowledge and innovation was adapted, so that the former balance-oriented European (and subsequently national) regional policy converted to a new policy in which both the sometimes contradictory objectives convergence and growth are equally combined and pursued. As a matter of fact, four priority areas should focus their efforts towards knowledge creation and innovation (European Commission, 2007a, p. 7):

- Investing more in knowledge and innovation.
- Unlocking business potentials, particularly of SMEs.
- Improving employability through flexicurity.
- Better management of energy resources.

For these four priority areas, more than EUR 85 billion are allocated, of which nearly EUR 50 billion should be invested in the improvement of innovative capacities in business by supporting technological transfer, networking, R&D and eco-innovation with regard to technologies and products (ibid, p. 7). Regarding the first priority, investments in R&D are seen as a crucial activity. The Commission underlines that especially new ways to enhance national and regional R&D have to be found, especially in a way of launching new world-class laboratories, instruments and infrastructures for fundamental research. Regarding the second priority, the promotion of entrepreneurship is a central activity. The provision of business support services should enable particularly SMEs to increase their international competitiveness. With these two priorities, classical research, technology and innovation policy objectives where integrated in a general regionally oriented cohesion policy framework.

This poses different challenges to policy-making in general, but to policy-makers at the different hierarchical levels in particular. Since the objectives of the Community strategic guidelines on cohesion policy have to be translated into national strategic reference frameworks (NSRF) and the operational programmes (OP) of the regions, it is not only necessary but obligatory that innovation policy is a field which must be dealt with on all policy levels. Although a distinction in innovation orientation is being made between convergence regions (between 2007 and 2013 on average 22 % of the structural funds budget will be dedicated to innovation in these regions) and RCE regions (40 %), innovation plays nevertheless a strong role in all European regions (European Commission, 2007c, pp.15-17). It is therefore necessary to discuss the challenges, potentials and bottlenecks of a policy orientation which is fairly new to political decision-makers re-

sponsible for regional policy (be it at the national or the regional level), and especially in those regions where not much experience has been made so far with the broad spectrum of innovation policy approaches and measures.

2.2   Regional innovation governance

Innovation policy is understood in this paper as an end-of-pipe activity, channelling pre-stage science and technology policy measures to market-ready solutions by a variety of information, transfer, networking or marketing activities (Meyer-Krahmer, 1989, p. 1). Since innovation does not only comprise technological aspects, but social and organisational inventions as well, innovation policy in a broader understanding aims at the creation of favourable conditions for innovative activities than only at the establishment of new technological paradigms or scientific breakthroughs.

The turn to innovation in regional policy (a not recent phenomenon as can be seen from the seminal article by Ewers and Wettmann, 1980) is complemented on the other side by a discovery of the region as appropriate unit for innovation policy design and delivery. According to both policy paradigms, regions are regarded as starting points for European and national innovation policies and for regionally designed measures, in which top-down as well as bottom-up approaches both pursue growth and balance-policy targets. This development was based on the theory-policy link which emerged during the late 1980s. This link describes the fact that "…social scientists working within the new innovation paradigm have been extraordinarily successful in building a constituency for innovation systems approaches and in the design and redesign of innovation policies" (Mytelka and Smith, 2002, p. 1477). An important element of that link were the multi-facetted analyses of national and regional innovation systems and their policy implications (cf. the early work by Cooke, 1992, or Nelson, 1993) as well as the decisive impulses derived from the cluster concept, developed and actively diffused by Michael Porter (Porter, 1990, 1998). Many of these national and regional concepts stress the importance of learning in the innovation process and underline the specific character of tacit knowledge and its implications for spatial proximity and the necessity of being embedded in certain spatial contexts for technological development and innovation (MacKinnon, 2002).

When discussing the challenges and potential of innovation policy for regional development, it is necessary to raise the question about the level of "region" that defines the territorial responsibility of 'regional' policy makers. This question is firstly related to the common definitions of regions, e.g. in a way of an administrative, functional or homogenous region (Schätzl, 2001, p. 99), or as defined by Ohmae (1995) as authentic community of interest. In cohesion policy, regions are defined either by the NUTS-1 or

the NUTS-2 classification of the European "Nomenclature des unités territoriales statistiques". These are administrative units, reflecting for example the "régions" in France (NUTS-2) or the federal states (NUTS-1) in Germany. Even within the same classification, regions are not at all identical functional or political-administrative spatial units, but vary in size, economic strengths, institutional settings and governance abilities. This relates to the second aspect of regional definitions: the possibilities for innovation governance and the level of political hierarchy. The scope of political autonomy is influences by the degree of political devolution and the national regime, be it centralistic or federal. Although in recent years more and more countries increased the regional autonomy in research and innovation policy (see for instance Rolfo and Calabrese, 2006 for Italy, Perry, 2007 for England, Crespy et al., 2007 for France, and Sanz-Menedez and Cruz-Castro, 2005 for Spain), political powers, budgetary responsibilities, experiences and responsibilities still vary to a great extent. This is both the case for convergence and for competitiveness and employment regions. As a matter of fact, in many regions multi-level innovation governance structures emerged (Perry and May, 2007). Multi-level governance (Benz and Eberlein, 1999, Kohler-Koch, 1996, Marks et al., 1996) describes the fact that due to the different policy levels dealing with the region as a platform for policy implementation, both top-down and bottom-up policy making processes shape "regional" policy so that political authority in regions is shared by a variety of supranational, national, interregional and intraregional authorities (Uyarra et al., 2007). What is also important to note in this respect is that a region is at least part of a superior, i.e. national, system, mostly accomplished by supranational political and sectoral spheres of influence. Regions, respectively their scientific, economic and political actors, have to cooperate not only with each other, but have to be linked with actors in the other influencing spheres in order to merge all necessary resources which affect the specific territory (Cooke et al., 2004, Asheim and Gertler, 2005). Multi-level governance structures can be attributed to the following aspects:

- The changing role of regions in European science, technology and innovation policy, triggered by the ERA concept and now enforced by the new cohesion policy (Capron, 2006; European Commission, 2001, 2007a);

- The devolution of political powers to the regional level in formerly centralised countries by which regional authorities are increasingly involved in various policy mechanisms (El Ouardighi et al., 2006).

- The emergence of new actors in regions which are both target groups of public policy measures and stakeholders by which they are able to intervene in policy making processes (Kuhlmann, 2001).

As a consequence, we witness an increasing complexity in regional policy making. The new challenge for regional policy makers is that regional development is more and

more affected by different types of policies ("policy mix") and by different political levels ("multilevel governance"). Usually, there is no dominant player in nations and regions, but the policy arena consists of a variety of political, corporate, social and scientific bodies (Kuhlmann, 2001, p. 961). Policy making does not only take place in the form of top-down decision-making, but is also the result of networking and bargaining between different societal actors, interest coalitions and systems. It necessitates effective policy learning mechanisms which allow policy makers to learn from past experiences, ongoing implementation processes and the assessment of future trends (Uyarra and Haarich, 2002). Especially with regard to the innovation orientation in cohesion policy it is necessary that policy makers possess sufficient competences and expertise for the identification of problems, the finding of appropriate solutions, the conception of instruments, the implementation of innovation policy measures within a complex mix of different policy approaches, and the establishment of an efficient and effective programme management.

2.3   Challenges for regional policy making

It has to be assumed that for many regional governments and their administration the new turn in cohesion policy poses challenges for which policy makers and administrators are not sufficiently experienced or originally qualified. Innovation is a policy field which is far more out of direct influence for policy makers than other economic promotion and regional development activities. Since policy makers are interested in evidences of their activities, they trust more in policies which guarantee successful or short-term results. It is also important to note that from the regional viewpoint it is far more necessary in innovation promotion to interact and to coordinate with other policy fields and administrative levels for which the regional administration is not responsible. This is one example of multi-level governance in which lower authorities have to coordinate their action with upper policy levels (Uyarra et al., 2007).

Besides the need for improved policy coordination between the regional, national and European level and for coordination of different policy fields like research, innovation, economic, structural or environmental policies which all could have impact on regional development, it is necessary to better understand the mechanisms and impacts of different innovation support strategies under the specific regional conditions. Due to institutional diversity and historical specificies in the regions (Johnson, 1992), different regions exhibit very different barriers to innovation. As a matter of fact, neither an ideal model of regional innovation promotion does exist (Tödtling and Trippl, 2005, Isaksen, 2003), nor is it adequate to expect that good practices can be replicated without any adjustments.

Nevertheless, whether a regional innovation policy could be effective has to be de-
bated. Many sceptical views about the effectiveness of this kind of policy are expressed
in the literature (Malecki, 1997). If regional innovation policy is able to shape and influ-
ence regional development paths is a matter of tailor-made policy concepts taking the
specific problem configurations into account, but also a matter of the local or regional
context. The boundaries of the specific territory in which the measures should be effec-
tive must not coincide with overall innovation regimes and thus restrict intended im-
pacts (Lambooy and Boschma, 2001).

Most theories, concepts and even empirical studies remain quite vague about possible
policy implications. Macro models contributing to the theoretical body of the new eco-
nomic geography deal with regional issues in a way that they make statements for two
regions (e.g. north and south), but did not translate their conclusions to a level which
allows it regional policy makers to directly transfer these conclusions into real regional
policy making (Lorenzen, 2001). They are too unspecific for the specific economic con-
ditions at the regional, i.e. sub-national level. This can not be regarded as a weakness
of the models, because the question arises immediately for which regional level con-
clusions should have been formulated.

As already mentioned, there exists such a variety of "regions" that no theory is able to
grasp the diversity of regional specificies. Many of these more explicit concepts like the
concepts of industrial districts or innovative milieux were inductively derived from either
an idealistic perspective of regional development or from regional case studies that
represented role models for the specific type of region. It is at least questionable
whether these models fit for all regional configurations similar to the described cases
(Moulaert and Sekia, 2003). Also the cluster approach, the most popular regional policy
concept in recent times, remains vague and unclear regarding its policy implications
(Martin and Sunley, 2003). Usually, clusters are understood as spatial concentrations
of enterprises, research organisations and intermediaries of a branch or related
branches, which are linked by value added chains (Porter, 1998). But regarding the
question, why clusters emerge and how they differ from mere network relationships,
different opinions exist (Koschatzky and Lo, 2007). Malmberg and Maskell (1997, p.
31-32) relate agglomeration advantages less to (static transaction) cost savings, but
interpret them to be of a subliminal and institutional, respectively socio-cultural nature.
Buenstorf and Klepper (2005) argue that cluster dynamics do not stem from agglom-
eration economies per se, but specifically rely on the organisational reproduction of the
regional firm population, especially through spin-off activities. Additionally, no profound
answer to the question exists whether firms grow because of spatial concentration and
whether clustering positively affects innovative activity and economic success (Martin
and Sunley, 2003; Geenhuizen and Reyes-Gonzalez, 2007). Although one could argue

that it is unimportant which kind of agglomeration effects are the most relevant, it is indeed very important for policy makers (and cluster managers) to learn more about the real mechanisms of cluster development. A general notion of agglomeration economies could be too vague for being able to tailor specific measures for cluster support. Even a dense network between firms and other organisations could not qualify for a cluster in the common understanding if spatial proximity between these actors does not play a prominent role. Due to the "fuzziness" of the cluster concept, cluster policy can be similarly "fuzzy" and unable to achieve the intended effects (Fromhold-Eisebith and Eisebith, 2005).

As a matter of fact, theory does not provide adequate answers to regional policy needs (Lorenzen, 2001). The generalisation of regional development trajectories, sometimes based on underlying regional role models which do not cover all possible regional configurations, leads to the bizarre fact that regional policy makers develop a certain understanding of how the development of their region should take place. Since theory is unable to provide precise policy answers, other regional role models are taken as source for orientation. In many regions a tendency to copy policy approaches which turned out to be successful in certain regions can be observed, not reflecting that the success could have been a single event highly dependent on specific regional actor constellations and framework conditions. One example of this copying approach can be mirrored in the ever increasing popularity of the cluster concept. Not only clusters, but also whole role models like successful regions from the USA, the UK or Finland serve for orientation. Due to their often unadjusted copying and the implementation of related policy approaches, disappointment may arise among the policy makers themselves, but also within the whole region, when intended effects and results does not occur or when within an expected period of time no real improvement in the regional economic performance can be observed. Role models do also serve the purpose of legitimation. In an environment which longs for a certain change and improvement, but which is characterised by uncertainty about possible new development trajectories, successful role models could be 'sold' more easily to policy makers than other not yet tested approaches. This can be interpreted as a way of path dependency by which the choice set in an uncertain environment is narrowed and decision making is linked to already proven development paths (North, 1990, p. 98). Additionally, policy makers can sell role models themselves more easily to their target groups. They can demonstrate that the specific concept or development path already proved its ability to create employment and wealth, by which critical voices can be overwhelmed. The always existing "not-invented-here syndrome" might exist, but plays only minor importance in these cases.

## 2.4	Conclusions and research questions

In this section it was argued that regions differ from each other with respect to their development level, but also with regard to their potentials in the public governance of innovation. Additionally, popular concepts like network formation or cluster development, which are intensively discussed in the theoretical literature, are still too fuzzy and thus unable to supply precise recommendations for policy-making. What is a problem for regional innovation policy itself is even a greater problem for cohesion policy which heavily draws on the knowledge and experiences of innovation policy. Dealing with uncertainty as the major characteristic of innovation processes is something new for policy makers which were up to now responsible for planning, infrastructure development or economic promotion activities. Especially the openness for learning from own and other experiences both in positive and negative ways is essential for policy makers dealing with the region to tackle the broad spectrum they face when they have to deal with regional innovation policy. In this respect, the existence of strategic intelligence in public administration is an important foundation for successful policy approaches (Kuhlmann, 2002). Learning in policy making can contribute to the acquisition of strategic intelligence (Nauwelaers, 2000; Bennett and Howlett, 1992). Policy learning includes, as many other learning processes, the creation and absorption of new knowledge among those who are responsible for political decision-making, forgetting of past routines when necessary and the understanding of new opportunities which new policy options offer. In this way it is related to professional expertise and proficiency in policy skills. As the innovation itself, learning is a cumulative process (Lundvall, 1992). Policy learning is thus based on already acquired competences and experiences in learning. It could therefore be assumed that policy learning takes place above all in environments which already learned to learn.

One of the most important tools linked to policy learning is evaluation. Especially since the major rationale for evaluation "…has shifted and evolved from an attempt to legitimate past initiatives and demonstrate accountability, to the need to improve understanding and inform future strategies" (Kuhlmann, 2004, p.1). Evaluation can be used for different purposes. It can measure performance and legitimate policy measures ex-post ("summative evaluation"), or it can be applied as a learning tool in a way that by evaluation intelligent information for current or future actions are collected (ibid, p.6). This "formative" function of evaluation supports learning processes best, because it is often interactive and includes participative, negotiation based processes in which all relevant actors can participate and intervene. While the evaluation culture is fairly well developed at the European and the national level, it has still to be developed at the regional level, especially in technology and innovation policy (Boekholt, 2003, p. 256). The reasons are manifold. Data collection and availability which is a necessary pre-

condition for evaluation is still in its infancy stage in most regions. Profound control and management mechanisms are often not well developed. Programmes and measures implemented at the regional level often involve a variety of actors and objectives, especially when a broad innovation objective is pursued, are a new element in regional policy making in which innovation policy does not fit to the institutional structures in the regional administration, display often a small budget and are attributed with a pilot function, and rely on dispersed funding coming from different sources (Boekholt, 2003). In this respect, cohesion policy could make a strong contribution to the development of a regional innovation culture because evaluation is already well developed within the structural funds framework, although still more established at the national than the regional level. Necessary processes for gaining experiences and for learning can for example take place via feedback-loops from the evaluation of ongoing programmes and measures formulated in the Operational Programmes.

On the basis of quite different socio-economic pre-conditions in European regions (as reflected in the characteristics of convergence and competitive and employment regions), the following research questions can be deduced from the theoretical outline:

1. Which specific policy strategies have been developed in these two types of regions regarding the implementation of EU structural funds and the Lisbon objective?

2. Which research, technology and innovation policy mix has been designed in the two regions, taking into account the   regional, national and EU level? How is it coordinated?

3. Is there evidence for successful policy learning, and can "good practices", in terms of innovative funding measures or procedures in implementing EU structural funds, be identified?

In the next section we will discuss two Operational Programmes and their utilization of innovation policy instruments. In order to eliminate the influence of different degrees of political autonomy, the two cases were taken from Germany, but reflecting the two types of cohesion policy regions, namely Bavaria as an example of a competitive and employment region and Saxony as an example of a convergence region. The case studies are structured according to the thematic orientation of the three research questions.

3   Case studies: Bavaria and Saxony

3.1   Introduction

Germany as EU Member State with a federal constitution pursues a bottom-up approach to drafting the National Strategic Reference Framework (NSRF) for the implementation of the EU structural funds in the period 2007-2013. As the implementation of European structural policy in Germany lies fundamentally with the competence of the federal states ("*Länder*"), they have made a significant contribution to the strategic development of the Reference Framework. At the national level, on the other hand, the federal government determined the "superstructure" in the interest of the country as a whole. The priority axes in the operational programmes of the *Länder* are oriented towards the strategic objectives of the NSRF and these once again to the EU guidelines. Within the ex ante evaluations, the so-called external coherence of the individual programmes with the superior objectives of European structural policy was already determined in this context. Therefore a high degree of agreement can be assumed between the levels of the operational programmes, the NSRF and the National Reference Plan as well as the superior goals of the European Union.

For an analysis of the implementation of the cohesion guidelines and its link to innovation policy, Bavaria and Saxony present interesting examples in that both federal states belong to different target regions with a view on the EU structural funds. In addition, both regions pursue different policy strategies, whether be it growth-oriented to catch-up in the techno-economic development process (in Saxony) or be it balance-oriented, favouring structural weak regions (like in Bavaria with regard to the border regions to the Czech Republic).

Bavaria receives structural funding from the EU within the target "Regional Competitiveness and Employment" (RCE) (via the ERDF and European Social Funds) and Saxony within the target "Convergence" (via the ERDF, European Social and Cohesion Funds). In accordance with the RCE target, all EU regions are eligible for funding which are not (already) being funded within the target *Convergence*. This priority clarifies best the "Lisbonization" of structural policy, as with it measures to improve the competitiveness and increase the attractiveness of regions and cities as well as employment should be supported. As can be seen in table 1, both regions realize a quite high degree of conformity with the Lisbon objectives. The so-called earmarking rate, which describes the contribution of the respective programme to the Lisbon process, amounts to 58% for Bavaria and 45% for Saxony. For the intervention field "Research and Technological Development, Innovation and Support of Entrepreneurial Activities", the

allocation is highest, with EUR 292.7 million in Bavaria and EUR 1.258 million in Saxony.

Table 1: **Breakdown of the ERDF-Budget towards the Lisbon-Goals (in Euro)**

	Bavaria	**Saxony**
Research and technological development, Innovation and Support of entrepreneurial activities"	292.751.000	1.258.435.544
Information Society	14.792.000	24.976.890
Energy	22.547.000	53.950.079
Transport	9.457.000	48.954.701
Conformity with Lisbon Goals **Share (%)**	**339.547.000** **58,0%**	**1.386.317.214** **45,0%**
Total budget ERDF	**575.934.188**	**3.091.140.000**

Source: StMWIVT (2007), SMWA (2007)

3.2 Focus Regional Competitiveness and Employment: Bavaria

Regional pre-conditions for EU structural funding

The Free State of Bavaria is one of 10 federal states in western Germany. Located in the south-east of Germany, and having borders with Austria and the Czech Republic, it is with about 12.5 million inhabitants the second most populous state in Germany, after North-Rhine-Westphalia. In 2005 Bavaria generated a regional GDP of PPS2000 339,945 million, which accounts for 17.8 % to the overall GDP in Germany. Approximately 10 % of the citizens live in the capital Munich, 4 % in Nuremberg and around 2 % in Augsburg. Since the fall of the 'iron curtain' and the enlargement of the European Union, Bavaria could strengthen the ties with eastern European countries. Nevertheless, the former border region to the Czech Republic remains to a certain degree underdeveloped. Most of the economic success of Bavaria is built on its manufacturing industries, namely the automotive industry, machinery and electronic products. Despite the rise of the Eastern European markets, other (western) European countries are still among the most important target markets for Bavaria.

Bavaria has one of the most advanced research and knowledge infrastructures in Germany and also in Europe.[2] The *total R&D spending* amounts to EUR 11,610 million in 2005, which contributes to more than 20 % to the total R&D spending in Germany (EUR 55,739 million. With an investment share of approx. 15 percent of the state budget, Bavaria invests in R&D more than any of the other non-city federal states in Germany. In the year 2005 2.91 % of the regional GDP was invested in R&D (GERD). The business sector accounts for 80 % of the spending and therefore contributes most to the overall R&D expenditures. Due to the structural weakness of the border regions to the Czech Republic, the Bavarian Operational Programme for the ERDF states that *"the border- and structurally weak regions in Bavaria do have the largest need for economic development"* and that apart from increasing efforts to support innovation and high-tech development in all Bavarian regions, *"border regions have to take their chances in the tourist industry and handcraft"* (StMWIVT, 2007, p.41)*.*

Strategic priority-setting of the Bavarian RTDI policy

Towards the end of the 1970s, the Bavarian government began to pursue a specific innovation policy which was backed by a national programme. Since 1982, the Bavarian government implemented the programme in sole administration and with own budget funds. In 1986, the technology promotion activities proceeded in two single programmes: the Bavarian Innovation Programme and the Bavarian Technology Adoption Programme. In 2000, both programmes were integrated in the Bavarian Technology Promotion Programme (cf. Berger, 2002, p.11).

The Bavarian government defines its innovation and technology policy as a major element within its economic policy in order to strengthen the regional economy. The main assumption is that regions compete for investors, growth and jobs. The Bavarian technology policy builds upon a long lasting experience in economic-, structural- and infrastructure policy as well as regional industry policy. These policies traditionally comprised innovation oriented elements regarding the promotion of structural techno-economic change. More recently, emphasis is placed on the thematic direction and on the formation of the industry-policy-science relationships. Basically, today's innovation and technology policy pursues the approaches which have first been implemented decades ago (StMWVT, 2000, p. 4; Berger, 2002, p. 5).

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[2] Bavaria hosts 16 universities, among them 11 public and 5 private. In addition, 11 art academies, 17 universities of applied sciences, 11 Max Planck institutes, 10 Fraunhofer institutes, 23 technology oriented start-up centers are located in Bavaria. Most of the higher education institutes are located in Munich.

The innovation policy objectives are on the one hand quite universal, on the other hand focus on several specific technologies. Both a policy of "strengthening the strengths" and in parallel of compensating structural weaknesses are pursued (StMWVT, 2000, p. 6). From an industry point of view, "traditional" industries (like the automotive industry and mechanical engineering), as well as basic- and cross-section technologies (e.g. laser technology, microsystems technology, mechatronics) and innovative future technologies (e.g. biotechnology, nanotechnology, ICT) are of strategic interest.

Complementary and supplementary to these overall strategic priorities of the Bavarian technology and innovation policy, the ERDF-funded measures should account for the economic, social and territorial cohesion by balancing the most important regional disparities. On the one hand, regional economies should be developed and structurally adjusted, including the conversion of manufacturing areas with a declining development. On the other hand, cross-border, transnational and interregional cooperation should be supported with the aim to contribute to a sustainable spatial development. The current Operational Programme (ERDF) will be implemented in five *priority areas*:

- Innovation and knowledge-based economy: thematic focus on the development of an innovative environment as a contribution to strengthen the regional competitiveness (Priority area 1)

- Support of the competitiveness of business firms and employment, especially of SMEs: focus on innovation in SMEs (Priority area 2)

- Sustainable development of cities in order to balance local and regional disparities: focus on the sustainable development of urban centres and their rural environment (Priority area 3)

- Risk prevention and conservation of resources: focus on sustainable development of natural resources especially under aspects of climate change (Priority area 4)

- Sustainable economic development of the border-regions (Priority area 5).

For priority area 1, which includes most of the innovation related activities, EUR 114.8 million has been allocated for the period 2007-2013. In addition, approximately EUR 79.5 million originates primarily from the Bavarian government, but also from the national level. The largest financial input is allocated to priority area 2, which focuses on the competitiveness of SMEs (cf. table 2). According to the SWOT-Analysis laid down in the Operational Programme, approximately half of the regular ERDF fund of EUR 491 million (without priority 5) should be allocated to the NUTS-2 border regions Niederbayern, Oberpfalz and Oberfranken (StMWIVT 2007).

Table 2: **Financial and technical information on the ERDF funding in Bavaria (in Euro)**

Priority Axis ERDF	EU contribution	National public contribution	Total public contribution
Innovation and knowledge-based economy (Prio 1)	114.835.000	79.484.200	194.319.200
Promotion of competitiveness and employment of SMEs (Prio 2)	173.601.881	95.712.000	269.313.881
Sustainable urban development (Prio 3)	103.272.000	84.657.600	187.929.600
Risk precaution and conservation of resources (Prio 4)	94.272.000	88.557.600	182.829.600
Sustainable economic development of the border region (Prio 5)	84.317.119	71.491.400	155.808.519
Technical assistance (Prio 6)	5.636.188	4.508.950	10.145.138
Total	**575.935.188**	**424.411.750**	**1.000.345.938**

Source: StMWIVT (2007)

On the strategic level, the Operational Programme for Bavaria is directly linked to the Bavarian Regional Development Plan (RDP), which forms the basic strategy for a sustainable economic, environmental and social development in all regions of Bavaria. The primary objective is the generation of homogeneous living and working conditions all over Bavaria. One the one hand, the RDP takes into account the regional concentration of resources – as formulated in the guidelines on cohesion policy – in order to enable a stable economic development of all regions. On the other hand, reference is made to the need of a competitive and innovative economic location. In line with a bottom-up approach in the process of drafting the Operational Programme, the overall policy strategy is to complement already existing measures with ERDF funds, without adjusting the specific guidelines of a certain policy field (e.g. innovation policy).

Policy instruments and policy mix

Due to the relevance for innovation support, we will concentrate on the first two priority axes. The strategic direction within priority axis 1 "Innovation and Knowledge-based Economy" is pre-determined by the specific objective of the creation of facilities and networks to promote technology and innovation. For the measures to be realized, the development of an innovative environment is the primary focus. For Bavaria, apart from the densely populated area of Munich, the following measures are regarded as fields where action is essentially required: promotion of cluster and network formation, expansion of the technological infrastructure and intensification of technology transfer,

extension of the regional knowledge base, utilisation of ecological innovations. The priority axis 1 thus supports the objectives of the Strategic Cohesion Guidelines of the EU 2007-2013 in particular and especially the promotion of knowledge and innovation.

The strategic direction of priority axis 2 "Promotion of the Competitiveness and Employment Situation of Enterprises, in particular of Small and Medium-sized Enterprises" is set by the specific objective of stabilising the availability of jobs and employment, taking into account the conditions of globalisation and technical progress. A focus of the priority axis is the innovative orientation of SMEs. Following aspects were considered hereby: new technologies, product and process innovations, innovative service products, service processes and services, innovation in single firms.

Table 3 provides an overview, classified according to important innovation policy tasks, of the various instruments of national, regional and European regionally oriented innovation policy. Quite remarkably is the fact that major technology and innovation oriented initiatives are initiated by the national government, but affecting the region (e.g. EXIST - The programme to support university-based start-ups, ProInno – R&D and network support for SMEs). Regarding the most relevant RTDI policy areas, a certain coherence of measures between the different governance levels can be observed. Thus, ERDF funds basically supplement already implemented regional initiatives. A good example is the Bavarian Cluster Campaign, which until 2008 was primarily funded by the Bavarian government. In the meantime, cluster related projects are financed by ERDF funds. Coordination between the national and regional level primarily occurs on the basis of programmes or initiatives, whereby the regional RTDI policy activities should supplement national (and EU structural funds) RTDI initiatives. In reality, due to different techno-economic performances of the regions and political priorities, redundancies and problems with regard to the "division of labour" between the different governance levels occasionally occur.

Table 3:   **Technology and innovation policy mix in Bavaria**

Policy Areas	Policy objectives and instruments at national level affecting the region	Policy objectives and instruments at regional level	Policy objectives and instruments implemented within the Operational Programme for Bavaria (ERDF)
Creation of an innovation and entrepreneurial friendly environment	EXIST, ProInno, R&D related special programmes, KfW schemes, SME policy	Business plan competitions, technology parks, foundation of "Bayern Kapital" (a public VC company); BayTOU, HOCHSPRUNG.	Innovative financing instruments, Promotion of investment in (innovative) single firms, Promotion of innovation in companies and promotion of technology-oriented spin-offs

Policy Areas	Policy objectives and instruments at national level affecting the region	Policy objectives and instruments at regional level	Policy objectives and instruments implemented within the Operational Programme for Bavaria (ERDF)
Networking, co-location and cluster-ing measures	BioRegio Munich; currently, cluster-related objectives are formulated in the High-Tech Strategy; "Competence Networks"	Bavarian Cluster Offensive (launched in 2006); Bavarian Research Alliances	Promotion of clusters and networks: Promotion primarily in the context of financing state-wide cluster platforms
Knowledge and technol-ogy transfer to enterprises	INSTI programme ("Stimulation of Innovation"); PVAs: patent exploitation agencies	"Bayern Innovativ"; Initiative "Bayern Patent" - patenting of research findings from Bavarian universities	Promotion of research and competence centres as well as technology transfer
Research collaboration of public research organisations with private sector	Programme "Joint Industry R&D". Focus on science-industry cooperation as well as industry-industry co-operation.	Bavarian Research Foundation (BFS) promotes research collaborations of public research organisations with the private sector (grants).	See policy area "Creation of an innovation and entrepreneurial friendly environment"

Source: own compilation based on different official documents

Evidence for policy learning

As pointed out in the theoretical part of this paper, the existence of strategic intelligence in policy and public administration is an important aspect for successful policy approaches. This is certainly true for public institutions that have often been established long time ago, but also regarding the question on how to implement (new) policy initiatives. In Bavaria, the establishment of a so-called regional management can be considered as a new approach at the interface of a regionalisation of the funding strategy and innovation policy. Regional management approaches have been implemented within the measure group "Support of Clusters and Networks" of priority axis 1. The basic idea of the regional management is the funding of regional or local development by project and network support. The general aim is to compensate structural weaknesses of a region and to improve the existing strengths, especially with a view to the business related hard and soft location factors. The regional management follows a systematic and comprehensive network oriented approach with a focus on the science-industry interaction and further network partners in the region (e.g. universities of applied sciences, branch associations, chambers of commerce and craft, etc.).

In Bavaria, success factors for the establishment of a regional management are platforms in which regional authorities, enterprises, public administration, chambers of commerce, universities and further stakeholders are integrated to establish and inten-

sify communication and cooperation. Addressee for the work of the regional manage-
ment is a regional advisory board or a steering committee with representatives of in-
dustry and science and respective network partners. Not all such organisations must
be newly created. Policy learning in the form of an institutionalization of regional man-
agement - or any other recently designed approaches - can also occur on the basis of
already existing structures (e.g. economic development agencies) that have to be
adapted accordingly.

3.3   Focus Convergence: Saxony

Regional pre-conditions for EU structural funding

The Free State of Saxony (*Freistaat Sachsen*) is one of six federal states in eastern
Germany and borders to the Czech Republic and Poland. With about 4.21 million in-
habitants (2008) it is the sixth most populous state. The three largest cities are Dres-
den (about 500,000), Leipzig (about 500,000) and Chemnitz (about 250,000) in which
about 30% of its population live. Important to note is that the population decreased
dramatically in nearly all counties and cities - with the exception of the two largest cities
Dresden and Leipzig. In 2005, Saxony produced a regional GDP of PPS2000 72,474.6
million, which accounted for about 4.2% to the overall GDP in Germany. Regional GDP
per capita reached EUR 19,260 which amounts to 73.5% of the German and 88.6% of
the EU25 average.

The economy of Saxony had to go through a severe transformation process after reuni-
fication. In consequence, a significant re-alignment of industrial activity took place,
which was partly linked to the inherited industrial structure, but was also the result of a
targeted industrial policy with the establishment of completely new manufacturing
plants (e.g. semiconductors and electronic industry). More recently, Saxony's economy
showed a more dynamic growth than any other eastern German region. This positive
development was primarily the result of an above-average growth of the service as well
as manufacturing sector. The most important industries of Saxony are the automotive
sector, the food industry, electronic engineering, metal production and processing, and
mechanical engineering.

Regarding the research and knowledge infrastructure, Saxony has seven universities,
twelve universities of applied sciences as well as various non-university research insti-
tutes, for example 11 Fraunhofer institutes, 6 Max Planck institutes and 7 Leibniz insti-
tutes. Thus, Saxony has a solid and quite advanced (semi-)public research and knowl-
edge infrastructure. The total R&D expenditure of Saxony amounts to EUR
1,986.1 million in 2005, which equals a R&D intensity of 2.33% (GERD/GDP). Saxony

ranks fifth in R&D-intensity among all German states and only narrowly missed the national average of 2.48% in 2005. Approximately 54% of the total R&D expenditures were spent in the higher education sector and public research institutes (2005); only 46.1% were spent in the business sector. This distribution is typically for all Eastern Germany states, which are characterised by a comparatively weak business sector and a comparatively importance of the public research system. Thus, Saxony can be characterised as a supply oriented research system. Within this context, the ERDF Operational Programme of Saxony states, that *"the economic basis of Saxony should be developed in line with the Lisbon strategy and a sustainable economic, ecological and social progress"* (SMWA, 2007, p.135)*.* The essential focus of the allocation is on investment and innovation.

Strategic priority-setting of the Saxon RTDI policy

In terms of innovation or the capability of the innovation system, Saxony is leading among the German convergence regions but lagging nationally. The state government is therefore engaged in continuously improving or adapting the regional innovation system. As in many other regions and nations, innovation policy in Saxony is often not driven by innovation policy rationales alone but very often motivated by the hope that investments in innovation might increase competitiveness and thus alleviate the unemployment problem.

In contrast to other German states, however, Saxony has not yet developed a central or comprehensive innovation policy document. Basically, policy is focused on a set of key technology fields defined in the 1992 "guidelines for technology policy". This agenda-setting in the early 1990s aimed to avoid that Saxony became locked into a 'follower status' by unduly supporting catch-up investment in profitable but already well-established fields. Instead, the Saxon government decided to focus on nascent technology fields ('future technologies') that still offer potential for Saxony to establish a national leading position (SMWA, 1992; SMWA, 2004; Riedel and Schmalholz, 2005): energy technology, material sciences, physical & chemical engineering, biotechnology, microsystems technology, information technology, production technology, environmental technology and medical technology.

According to the "Lisbonization" of the EU structural policy and the points of intervention defined by the Saxon Ministry of Economic Affairs and Labour, the ERDF funding strategy sets a focus on *"the use and development of consistent growth-, innovation- and education potentials"* (SMWA 2007, pp.137ff.). The share of the ERDF-budget for the priority axes "Innovation, Science, Research" (Priority 1) and "Education" (Priority 2) accounts for 42% in the current funding period (see table 4). In addition to the total

EU funding, national public contribution for the two priority axes amounts to EUR 396 million.

In detail, priority axis 1 has the following objectives: to increase the innovation potential of industry by promoting R&D in individual firms, science and research cooperation and technology transfer, promote school education by optimising the educational infrastructure, strengthen the information society (e.g. e-business projects, e-government projects). With regard to the measures to be implemented within priority axis 2, the promotion of investment and the *Mittelstand* play a central role (e.g. promotion of single firm's investments, subsidised interest rates, and market access for SMEs). However, the Operational Programme emphasises that besides the classical promotional measures to support investments, also those projects will be supported which mobilise the innovation potential of the region and directly reinforce entrepreneurial initiative.

Table 4:   Financial and technical information on the ERDF funding in Saxony (in Euro)

Priority Axis ERDF	EU contribution	National public contribution	Total public contribution
Strengthening innovation, science and research (Prio 1)	1.079.140.255	318.748.857	1.397.889.112
Improvements in education and training infrastructure (Prio 2)	235.680.127	77.840.340	313.520.467
Enhancing the competitiveness of the manufacturing industry (Prio 3)	587.456.417	191.95.713	779.412.130
Improving the transport infrastructure (Prio 4)	573.460.114	178.497.184	751.957.298
Expansion and improvement of the infrastructure to permit durable economic growth (Prio 5)	571.443.473	182.615.461	754.058.934
Technical assistance (Prio 6)	43.959.320	14.653.105	58.612.425
Total	**3.091.139.706**	**964.310.660**	**4.055450.366**

Source: SMWA (2007)

The specific strategy of Saxony within the context of the EU structural funding is directly related to the overall innovation policy strategy which has been implemented in the course of the (still ongoing) economic transformation process. The key assumption is that a well established network of technology oriented institutes in a capable research landscape and a high-level education system form the basis for a competitive and adaptable economic structure. ERDF structural funds are allocated for R&D projects to complement already existing approaches and thus to achieve leverage affects. The planned (and partly already realized) activities in the priority axis "Innovation, Sci-

ence and Research" should positively contribute to employment and turnover of the Saxon enterprises. Cluster and network formation have been identified as important measures to compensate for disadvantages in connection with the small size of most of the Saxonian companies (micro enterprises).

As a region being funded under the convergence target, Saxony's ERDF strategy comprises also a special focus on infrastructure related projects. Whereas most of the innovation related ERDF funding strategies in RCE and Convergence regions show merely differences regarding the coupling to already existing regional strategies - compared to the concrete measures itself (apart from the budget) -, infrastructure related policies are much more important in the convergence regions than the RCE regions. As indicated in table 4, infrastructure related measures are assigned to different priority axes. Regarding innovation and technology, environment-friendly modes of traffic and the linking of commercial investment support to ecological innovations are the most relevant infrastructure oriented approaches.

Policy instrument and policy mix

Since unification regional innovation policy in Saxony has been driven by the intention to create, or, from a historical perspective, to re-create regional innovative potential. It was acknowledged that sufficient momentum for such a transformation of the regional innovation system could neither be created by attracting external investors nor be solely based on existing structures. The overall objective of the Saxon technology and innovation policy has not changed over the last ten years: at the beginning of the 21st century an increase of the innovation potential of enterprises and to guarantee a scientific high-quality infrastructure are still the major policy objectives.

According to the logic of the objectives, strategic fields of action are the R&D support in certain key technology fields (e.g. medical technologies, environmental technologies, microsystems technologies, information technology, etc.) and the creation of 'cores of crystallisation' for innovative development, i.e. to first establish a strong public research infrastructure and then start cluster initiatives to have private investors follow suit. Apart from these strategic fields, the following concrete instruments or measures have been implemented (cf. Sächsische Staatskanzlei, 2001):

- Promotion of the development of new or novel products and processes (support of single firms),

- Promotion of innovative, technology oriented joint projects in the field of the above mentioned key technologies,

- Funding scheme: "Support of technology centres" in Saxony,

- Promotion of Intellectual Property Rights (promotion of patenting),
- Promotion of the employment of Innovation Assistants,
- Granting investments in non-university, economy oriented research facilities.

The allocation of funding by the Saxon Ministry of Economics and Labour (SMWA) is generally not reduced to the currently promoted technology fields. In contrast, it is demand-driven and allocation depends on the actual number of successful applications submitted by field (Riedel and Schmalholz, 2005). In fact, the SMWA uses the demand for funding as an indicator whether the current active promotion campaigns still follow the need of the business actors.

In addition to the innovation promotion scheme of Saxony, additional funding initiatives have been implemented by the federal government – either in the shape of targeted policies for eastern Germany (e.g. FUTOUR, InnoRegio, InnoProfile) or within the context of the promotion of regional role models (e.g. EXIST). Table 5 illustrates the most important innovation policy instruments on the different policy levels. As for the EU structural funding, the first priority axis underlines the importance of innovative capacity to overcome the socio-economic challenges. The change to a competitive knowledge society comprises, besides technological, also organisational, logistical, financial, marketing-relevant and infrastructural viewpoints. Therefore elements of promoting individual firms are combined with the promotion of the research and educational infrastructure. Special attention is paid to building up innovative competences in Saxony's enterprises, as well as in research and scientific institutions. Furthermore, the educational sector has high priority.

Table 5:   Technology and innovation policy mix in Saxony

Policy Areas	Policy objectives and instruments at national level affecting the region	Policy objectives and instruments at regional level	Policy objectives and instruments implemented within the Operational Programme for Bavaria (ERDF)
Creation of an innovation and entrepreneurial friendly environment	EXIST, ProInno, R&D related special programmes, KfW schemes, FUTOUR, InnoRegio, InnoProfile	R&D funding programmes, public VC initiative	R&D promotion of individual firms, Venture Capital for young technology enterprises
Networking, co-location and clustering measures	Support for regional-ised network initiatives (Entrepreneurial Regions: Innovative Regional Growth Poles), "NEMO", "intec.net", "InnoNet"	Regional support for co-operative R&D projects; comprehensive initiatives including the set-up of new cluster institutions	Business Networks: Promote small operative networks in R&D joint project promotion, network management and network marketing.

Policy Areas	Policy objectives and instruments at national level affecting the region	Policy objectives and instruments at regional level	Policy objectives and instruments implemented within the Operational Programme for Bavaria (ERDF)
Knowledge and technology transfer to enterprises	INSTI programme ("Stimulation of Innovation"); PVAs: patent exploitation agencies	support for: technology parks/incubators; external industrial research associations; technology transfer centres, IPR consulting centres	Support of application-oriented research projects and -infrastructure, technology transfer
Research collaboration of public research organisations with private sector	Support for industry-research relations in the context of the High-Tech strategy; "AiF", "ZUTECH"; FHprofUnd"; "Networks of Competence"	Regional support for co-operative R&D projects; comprehensive initiatives (e.g. "Biosaxony", "Silicon Saxony")	Promotion of R&D joint projects: Promote development of new products and processes in the area of future technologies

Source: own compilation based on different official documents

The most relevant coordination mechanisms of the Saxonian innovation policy have been implemented in the form of informal taskforces in the case of large projects (stakeholders: Federal Ministry of Education and Research (BMBF), Federal Ministry of Economic Affairs and Technology (BMWi), Saxon Development Bank (SDB), Saxon Ministry of Economic Affairs, Technology and Transport (SMWA), Saxon Ministry of Science and Arts (SMWK), Universities of Saxony, Enterprises). Informal contacts in the form of coordination exist between the SMWA, SMWK and the SDB. Of a more formal nature are the taskforces of the federal and the federal states governments as well as the Joint Science Conference and the Joint Agreement for the Improvement of Regional Economic Structures. The coordination of the EU structural funds is done via so-called regional conferences in Chemnitz, Dresden and Leipzig (bottom-up), the integration of different stakeholder groups (e.g. unions, branch associations, non-governmental organisations) and the discussion of regional consultations with the federal government.

Evidence for policy learning

The Saxon government considers the Excellence Initiative of the federal and the federal states governments as an important "vehicle" to strengthen the regional universities in terms of capability, attractiveness and international visibility. The support of universities with the aim to strengthen their research and technological development potential in key technology fields is one of the major objectives. In the framework of the Saxon Excellence Initiative, EUR 160 million come from the ERDF funding scheme as well as from Saxon funds. Special attention will be given to joint research activities,

integrating the respective university and enterprises. In line with the scientific and technological profiles of the universities and the key technology fields that already receive funding, the Saxon government expects a qualitative technological push.

The Excellence Initiative is an interesting case for policy learning in the way that previous experiences and results of the Excellence Initiative have been taken into consideration for the design and implementation of the respective Saxon initiative. At the same time, the approach can be regarded as an innovative process in terms of a competition procedure among the Saxon universities - and also non-university research institutes and universities of applied sciences. Furthermore, the approach requires new modes of coordination, given the fact that a multitude of public bodies and policymakers are involved.

4   Conclusions and policy implications

It was the objective of this paper to discuss possible challenges for regional policy makers triggered by the emphasis on innovation and knowledge in European cohesion policy. It was argued that the policy mix became more complex combining regional, industrial, economic development, technology and innovation policy approaches and that policy learning through mutual exchange, good practice examples and evaluation exercises is essential in order to formulate and implement measures which are as effective as originally intended. Two case studies were presented in order to show a possible spectrum of regional and innovation policy measures and the interconnections between national, regional and European programmes and measures aimed at the strengthening of knowledge generation and innovation in regions. Regarding the three research questions formulated in section 2.4, the results of this paper can be summarized as follows.

Specific policy strategies that have been developed in the two types of regions regarding the implementation of EU structural funds and the Lisbon objective

In both regions innovation policy is integrated in an overall framework of economic development policy. While in Bavaria the Technology Promotion Programme defines the innovation policy framework and links are established between this framework, the Operational Programme and the Regional Development Plan, in Saxony no such comprehensive policy framework exists. Nevertheless, both regional governments can look back to a quite long tradition in the implementation of innovation policy programmes aiming at regional development and the reduction of economic and social disparities.

In line with a bottom-up approach in the process of drafting the Operational Pro-
gramme, the overall policy strategy of both regions is to complement already existing
measures with ERDF funds, without adjusting the specific guidelines of a certain policy
field (e.g. innovation policy). In both regions for example, ERDF structural funds are
allocated for R&D projects to complement already existing approaches and thus to
achieve leverage affects. In contrast to Bavaria, Saxony's ERDF strategy comprises a
special focus on infrastructure related projects. Whereas most of the innovation related
ERDF funding strategies in RCE and Convergence regions show only slight differences
regarding the coupling to already existing regional strategies, infrastructure related
policies are much more important in the convergence regions than the RCE regions.

Design of research, technology and innovation policy mix which takes into ac-count the regional, national and EU level; coordination of policies

What can be seen from the Bavarian and the Saxon case study is that both regions
apply a broad mix of different policy measures, supporting all innovation policy tasks
with relevance to regional development. In general it can be said that the cohesion pol-
icy instruments implemented in the convergence region Saxony and the competitive
and employment region Bavaria do not differ to a great extent. For instance, both re-
gions promote clusters and network formation, e.g. through the development of cluster
platforms and the promotion of R&D networks between firms and research organisa-
tions. In Bavaria, ERDF funds are used to supplement regional funding for cluster de-
velopment in order to increase the scope of this measure and the available funds for
the promotion of specific projects which could not be supported with the regionally
available funding. In this respect, ERDF funds are used to achieve specific leverage
effects. The cohesion policy in Saxony is more oriented towards a focus on the promo-
tion of R&D networks for and between SMEs, but this measure is also related to the
further development of regional clusters. As compared to Bavaria, it is more a parallel
activity than closely integrated in an already ongoing cluster promotion measure.

As pointed out above, in Saxony there is a slightly stronger focus on innovation related
infrastructure development, while the promotion of education, research and technologi-
cal innovation is a little bit more emphasized in Bavaria. In both regions the chance
exists to create useful interfaces between the already implemented national and re-
gional measures and the measures intended by the Operational Programmes. This
however will require an extensive support of applicants in the regions in order to make
best use of this new set of measures – especially in Saxony where the government
already pursues a demand driven policy approach.

Evidence for successful policy learning

In both regions good practice examples for policy learning can be found. They are more pronounced and comprehensive in Bavaria, e.g. with regard to the regional management platforms. This reflects the longer innovation policy experiences of Bavaria by which more sophisticated structures and activities had the chance to develop in this federal state. In Saxony, policy learning takes place on a programme level, e.g. by utilizing experiences made at the national level and applying this knowledge for regional policy making, e.g. in the framework of the Excellence Initiative. Besides these two examples, experiences in both *Länder* have already been made which helped to reduce uncertainty and which contributed to the formation of strategic intelligence, especially with regard to the implementation and evaluation of certain measures. For example, the network strategy of Saxony was evaluated in 2004 (Ossenkopf et al, 2004), and the cluster strategy of Bavaria was subject of an interim-evaluation in 2008 (Bührer et al., 2008).

In principle, the Lisbon orientation in cohesion policy implies chances as well as risks for the regions. Chances lie in the relatively openness with regard to the strategies that can be developed at the regional level. The objectives formulated by the superior policy levels are quite general, so that strategies and measures can be developed bottom-up. This can of course also be a risk because the degree of freedom given to the lower administrative levels is quite high and thus are the chances to formulate measures which do not really match regional problems and needs. It is this aspect of cohesion policy which requires a profound assistance for policy makers inexperienced in innovation policy, e.g. in the form of exchange platforms or good practice manuals. This possible risk of policy failure is increased by the fact that the highest share of cohesion policy funds is allocated to the convergence regions of which many do not have a long record in regional innovation policy experiences. What could be observed at least in the past is what Landabaso et al. (2001, p.248) called the regional innovation paradox. This term should express the fact that regions with an already above average innovation capacity applied more for innovation funding at the European Commission compared to those regions which were in the need of innovation funding because they displayed a lower innovation capacity. This makes it clear that policy learning is an important element in the ongoing process of the merger between cohesion and innovation policy and that ongoing and ex-post evaluation of programmes and measures is essential as ever to reduce misallocation of public funds and to increase the effectiveness and efficiency of this new cohesion policy.

A final aspect which should be mentioned in the context of the merger between cohesion and innovation policy are the future prospects of this policy turn. What regions

face nowadays are the sometimes dramatic implications of the recent financial and economic crisis. While the ERDF funds are allocated and not in question, it remains open whether for the national and regional co-funding the same will hold true. On the one hand, many national governments invest in the science system, in infrastructure development or in programmes supporting innovative and economic activities in firms in order to support the business cycle and to prevent a too strong economic slump in recent days, but only at the expense of increasing public debts. On the other hand, the expenditures have to be refinanced afterwards, certainly by tax increases or by a cut-back of public services. Due to the expected decrease in per capita incomes during the next years, the statistical effect of increasing R&D expenditures (denominator effect) will blur the real long-term effect of diminishing public investment opportunities in R&D and innovation and the questioning of the three per cent objective (Schibany, 2008). Under these circumstances which could not be anticipated at the time of the formulation of the new structural policy objectives, a reliable and sustainable structural policy framework is an essential prerequisite which could help regions and their government to bear up during the economic crisis and to establish favourable starting conditions for a new economic upturn.

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