Knut Koschatzky

The uncertainty in regional innovation policy: some rationales and tools for learning in policy making

Fraunhofer

ISI

Contents   Page

Abstract

This paper deals with two major dilemmas in regional innovation policy making: The dilemma that theory does not provide sufficient answers for the formulation of specific innovation policy measures addressing the problem configurations of single regions and the dilemma that role models are used as a substitute for orientation. In order to support policy learning, different approaches like evaluation, the development of innovation strategies and regional foresight are discussed.

Keywords: Regional innovation policy, Multi-level governance, Policy Learning, Evaluation, Regional Foresight, Innovation Strategies

JEL classifications: H11, O18, 031, 032, R58

1   Introduction

In innovation policy, the recent years can be characterised by a discovery of the region as appropriate unit for policy design and delivery. Regions are regarded as starting points for 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/Smith 2002: 1477). An important element of that link were the multifacetted analyses of national and regional innovation systems and their policy implications (cf. the early works 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 1998; 1990). 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). Unfortunately, approaches like the "learning region" (Florida 1995; Hassink 2007; Morgan 1997) offer only vague ideas about processes from which policy learning could contribute. Nevertheless, these ideas have been adopted by national and regional policy makers as rationales for an innovation policy in which the region plays a far more active role than before (Lagendijk 1999).

Not only policy programmes and measure are becoming more complex, e.g. multi-actor and even multi-measure approaches in cluster promotion, but also policy making as

such in multi-level policy arenas (cf. Perry/May 2007). It is therefore necessary that policy makers, and especially regional 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, and the establishment of an efficient and effective programme management. Based on the ever growing complexity and the multi-facet structures of regional innovation policy, the question has to be raised how policy makers can learn from own and from other experiences. Taking this question as a starting point, it is the objective of this contribution to discuss rationales for policy learning, to present some tools which could foster learning processes, and to draw the attention to problems policy makers might face in learning from other experiences (Hassink/Hülz 2006).

2   Characteristics of regional innovation policy

Innovation policy is understood 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: 1). The public stimulation of networking between research institutes and enterprises for the sake of bringing technological or organisational solutions to a pre-market stage is a classical instrument of innovation policy. 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 (Meyer-Krahmer 1997).

When discussing the scope and impacts of regional innovation policy, it is necessary to raise the question about the level of "region" that defines the territorial responsibility of 'regional' policy makers. This is not only related to the common definitions of regions, e.g. in a way of an administrative, functional or homogenous region (Schätzl 2001: 99), or as defined by Ohmae (1995) as authentic community of interest, but to the political hierarchy. A "region" could be, among others, a metropolitan area, a county, a province or a federal state. Depending which region is meant, political powers, budgetary responsibilities, experiences and responsibilities vary to a great extent.

At least two major difficulties arise in regional innovation policy making. The first is related to the fact that research is performed and technology and innovation are developed at a global scale. It is therefore important to share competences between countries and sectors and not to regard the region as an island. The second results from the emergence of multi-level innovation governance structures (cf. the different articles in the special issue of Regional Studies, Vol. 41, No. 8, November 2007). Multi-level gov-

ernance (Benz/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). The two difficulties can be attributed to the following aspects:

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

- 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 and by different political levels. Although a real devolution of powers did not take place in all European countries so far, the decentralisation of certain responsibilities is a major characteristic of recent developments. It can be observed that multi-actor and multi-level governance structures emerge across Europe. 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: 961). Policy making does not take place in the form of top-down decision-making, but is a 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/Haarich 2002).

With regard to the level of 'region' for which conclusions about its policy making abilities should be drawn, different qualifications and objectives of its policy makers can be found. The lower the hierarchical level, the more regional policy makers are routed in routines of regional infrastructural policy and planning. Compared to "brick and mortar" infrastructural development, innovation policy displays other characteristics. The uncertainty by which innovation processes are characterised (Freeman/Soete 1997) holds true for innovation policy as well. Contrary to the focus on infrastructure development of classical regional policy, it is by far more difficult to attain intended results in the promotion of an innovation friendly environment or by providing incentives for network formation. Results are not clearly visible within a short-term perspective and cannot be pre-

sented to the public like the inauguration of a building or a road. Due to different approaches and the non-linearity of policy input and the intended output, a high degree of experimentalism in policy making is needed.

For this kind of policy making policy makers and administrators in regional governments and authorities are often not originally qualified. Innovation is a policy field which is far more out of direct influence for policy makers than other economic promotion 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 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.

Besides the needs for improved policy coordination between the regional, national and supranational level and for coordination of different policy fields like 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 policy instruments under the specific regional conditions. Due to institutional diversity and historical specificies in the regions (Johnston 1992), different regions exhibit very different barriers to innovation. As a matter of fact, neither an ideal model of regional innovation policy does exist (Isaksen 2003; Tödtling/Trippl 2005), nor is it adequate to expect that good practices can be replicated without any adjustments (Hassink/Hülz 2006). At this point, two levels of complexity interfere with each other. The first level is related to the impact different policies with regional and non-regional focus could exert on regional development. It is by far not the case that only regional policies are regionally effective, but also technology policy, for instance, could have non-intended regional effects in a way that the promotion of firms and research institutes could strengthen spatially imbalanced structures by supporting locations which are already well developed (Sternberg 1996). These are generally top-down policy implications by which the national government follows the objective of strengthening national technological competitiveness, but which could counteract the objectives of policy makers in regions which do not provide the prerequisites of profiting from such policies. This aspect addresses the conflict between growth and balance oriented policy targets (Koschatzky 2005b) to which regional policy makers often have to find an answer. In order to couple up to overall policies or to mitigate the impacts of such policies for certain regions, it is not only necessary to know about these policy effects, but to understand the different impact relations with regard to the single region.

The other aspect is related to the specific character of regional innovation policies. Whether a regional innovation policy could be effective has to be debated. 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 influence 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 effective must not coincide with overall innovation regimes and thus restrict intended impacts (Lambooy/Boschma 2001).

3 Dilemmata between the need for orientation, competences and experiences

Due to the uncertainty in innovation policy making regarding the attainment of the intended results, and a certain lack of experiences in the execution and implementation of innovation policy instruments at the regional level, policy makers and their administration search for orientation. Here they face a twofold dilemma.

The first dilemma is related to theory. Most theories, concepts and even empirical studies remain quite vague about possible policy implications. Macro models contributing to the theoretical body of the new economic 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 conditions 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 conclusions 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. But also other, more explicitly regional concepts, provide some disorientation. Many of these concepts, e.g. 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/Sekia 2003). Also the cluster approach, the most popular regional policy concept in recent times, remains vague and unclear regarding its policy implications. 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/Sunley 2003; van Geenhuizen/Reyes-Gonzalez 2007). As a matter of fact, theory does not provide ade-

quate 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.

Here we face the second dilemma. 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 (Hassink/Hülz 2006). 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 do not occur or when within an expected period of time no real improvement in the regional economic performance can be observed (Saublens et al. 2008). 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: 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.

4   Tools supporting regional policy learning

The openness for learning from own and other experiences both in positive and negative ways is essential for regional policy makers and administrators in order 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 the regional public administration is an important foundation for successful policy approaches. Strategic intelligence is "...a set of – often distributed – sources of information and explorative as well as ana-

lytical (theoretical, heuristic, methodological) tools employed to produce useful insight in the actual or potential costs and effects of public or private policy and management" (Kuhlmann 2002: 17). Strategic intelligence can be acquired through policy learning. Policy learning is, according to Nauwelaers (2000), "... the capacity of policy makers to grasp the trajectories taken by firms in their knowledge governance modes (...) and the capacity to respond to such changes by developing flexible policy approaches in instruments" (cf. also Bennett/Howlett 1992, for a definition of different forms of learning in policy). 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.

4.1 Toolbox of innovation policy measures

One possibility for policy learning and for offering orientation about possible policy tools and instruments is the development of a tool-box summarising positive and successful policy concepts based on experiences at the regional scale that have been made in the last years. As already pointed out, unadjusted copying of role models and policy measures does not reflect the diversity in regional economic and political contexts. It is therefore necessary to provide a framework of learning tools and approaches which have been implemented at the regional level in recent years. A typology had been developed by the Fraunhofer Institute for Systems and Innovation Research (Fraunhofer ISI) in the context of the EU funded project "Supporting policy making with innovative assessment tools (SupPolicy)" (Baier et al. 2007). This typology draws on the classification of objectives which is used in the assessment templates of the EU Trendchart Reports. It has, however, been significantly modified to incorporate additional objective-based dimensions of innovation policy that were found missing on the basis of regional policy experiences by Fraunhofer ISI

A first major framework of reference was produced by a screening of all currently implemented policy measures as listed in the Annexes of the Trendchart on Innovation Reports published by the Directorate-General for Industry of the European Commission. Based on content analysis of those lists of programmes, a list of "types of policy tools" relevant for the regional level was developed which could then be assigned to the objective-based policy dimensions. Further structuring involved the identification of

target groups at which the policy measures aim. Therefore, this framework provides a threefold overview of the major technology and innovation policies in Europe: firstly, it provides the reader with a list of underlying policy objectives, secondly it links those objectives to relevant target groups in the innovation process, and thirdly it displays policy measures which are currently used in different regions throughout Europe (ibid: 3).

According to this toolbox, a distinction can be made between seven broad objectives (cf. table A.1 at the end of this paper):

- Improve innovation governance and strategic intelligence for policy making
- Foster an innovation friendly environment
- Higher education, human capital development and gender issues
- Development of research infrastructure
- Strengthen innovation including the protection and commercialisation of intellectual property (including the sub-objectives: strengthen entrepreneurial innovation in the SME sector, industrial policy and strategic technology policy)
- Encourage technology and knowledge transfer to enterprises and development of innovation poles and clusters
- Promote and sustain the creation and growth of innovative enterprises.

The purpose of the toolbox is twofold: firstly, it should enable policy makers and administrators to quickly and comprehensively assess the broad spectrum of measures under each objective for the different target groups; secondly, it should point to the necessity of strategic intelligence (and thus policy learning) for policy making. Under this objective, policy makers are the most important target group.

According to the toolbox, the perspectives for policy learning are manifold. It can take place within different time perspectives by drawing conclusions from past experiences, from the current situation, and from possible futures. Learning is possible from own experiences, e.g. from the management and implementation of all those policy measures listed in the toolbox. It is possible by information exchange, i.e. the experiences made by others. The most important approaches and measures which can contribute to policy learning and to an enhancement in strategic intelligence are listed under the first objective "Improve innovation governance and strategic intelligence for policy making" in Table 1: strategic vision, innovation studies and evaluation, innovation strategies, and transregional co-operation. The following part of the paper will focus on these approaches. The importance of benchmarking and transregional institutional learning has already been highlighted in the contributions by Huggins (2009) and Wink (2009). The remaining approaches are briefly discussed in the following.

4.2 Evaluation

An important tool linked to strategic intelligence and 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: 1). Evaluation can be used for different purposes. It can measure performance and legitimate policy measures expost ("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: 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 national level, it has still to be developed at the regional level, especially in technology and innovation policy (Boekholt 2003: 256). The reasons are manifold. Data collection and availability which is a necessary precondition 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 mostly 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). This makes it much more difficult to establish an evaluation culture in regions than at the national level. Although the European Commission forced regions to develop a certain evaluation standard within the RITTS and RIS programmes (Charles et al. 2000), most regions only recently introduced evaluation at their policy agenda and discovered this tool as learning instrument.

4.3 Innovation strategies

Starting in the mid 1990s, the regional technology plan (RTP) programme, followed by the regional innovation strategies (RIS) programme by the Directorate-General for Regional Policy (and the regional innovation and technology transfer strategies (RITTS) programme by Directorate-General for Research) were the first approaches which placed innovation as a key priority for the policy agenda of regional governments in a way that it should help the regions to help themselves (Landabaso et al. 2001: 258). Based on the notion of collective learning (Keeble et al. 1999; Lawson/Lorenz 1999), regional innovation capacities should be improved and new possible development trajectories be exploited. In the regional contexts of that time, these objectives could not

have been fulfilled without the facilitation of learning processes within the regional innovation actor's community. The trans-regional innovation projects programme (TRIPs) by DG Regio and DG Research focused on the implementation of measures by joining forces and comparing exercises in several regions. Policy makers and key regional actors were involved in trans-regional exchange and learning processes, because innovation strategies had to be elaborated jointly. The RTP, RIS and RITTS programmes highlight the difficulties and contradictions in regional policy learning. They did not act as starting point for learning processes in regions only, but are also one of the reasons why the assumption diffused that the regional system of innovation is a concept which could be implanted easily in all regional contexts. This raised the necessity for a more profound discussion about the possibilities theoretical concepts could offer for policy advice.

Since the mid 1990s, Fraunhofer ISI was engaged in several RITTS, RIS and other projects aiming at the improvement of the regional innovation conditions (Koschatzky 2003; Zenker 2001). Depending on whether the project was carried out in the mid or late 1990s or during the first years of the new century, a shift of major regional development paradigms occurred. While networks and the systemic view of regional innovation processes were most popular during the 1990s, learning issues and a focus on human capital including entrepreneurship outweighted the network paradigm in later years. Recently, it is the cluster concept which seems to be the most important ingredient in an innovation based regional policy recipe (Martin/Sunley 2003). Based on these paradigms, it proved helpful in many of these projects to contrast the policies implemented so far in the regions under investigation with policy concepts from other regions of a similar type. Typologies of policy measures in the way as described above supported the assignment of extra regional concepts to the regional policy mix. While in certain cases some of the presented measures raised interest, it was also the case that due to the very precise level of argumentation the "not invented here-syndrome" caused a longer political debate about the supposed need to specifically adjust a measure to the specific structural characteristics of the region, e.g. with regard to firm size distribution, branches, and innovation levels in firms. In general, the following success factors could be identified in order to contribute to target-oriented policy making in regions (Koschatzky 2001: 344-345):

- the creation of trust as basis for cooperations and networks,
- the identification of promoters, target groups and policy objectives,
- the allocation of public funds or joint fund raising in public private partnerships,
- ongoing evaluations for improving the efficiency and effectiveness of programmes and other activities,
- openness for new instruments, experiences in other regions, and learning.

Besides the benchmarking with other regions and their policy measures (performance benchmarking in the way described by Huggins 2009), interregional policy learning took also place in these projects by bringing people (policy makers, representatives from research organisations) together.

One learning exchange platform is the European ERA-NET programme (Horvat et al. 2006: I). It aims at the improvement of coherence and coordination in innovation policy within the European Research Area by

- the systematic exchange of information and good practices on existing programmes and activities,
- the identification and analysis of common strategic issues,
- the planning and development of joint activities between national and regional programmes,
- the implementation of joint trans-national activities, including joint calls and programmes.

Through this activity, mutual learning processes could be initiated, but there still some room for improvements in the programme and the coordination between the participating governmental bodies (Horvat et al., 2006, p. II). Although seminars and the personal exchange are no guarantee for successfully improving the innovation policy of a region, it could be at least an important step in those cases where trust and mutual understanding had developed between the partners.

4.4   Regional Foresight

A tool for the formulation of a regional vision and a regional innovation strategy which should translate this vision into policy action could be regional foresight. Regional foresight is "a systematic, participatory, future intelligence gathering and medium-to-long-term vision-building process aimed at present-day decisions and mobilising joint actions" (Renn/Thomas 2002: 11). It includes the openness for an engagement in vision-building foresight processes (Gertler/Wolfe 2004), the acceptance of the formation of new politico-economic institutional arrangements, the support of the evolution of future-oriented development trajectories, an explicit system of research priority-setting and coherent research planning, and the installation of evaluation procedures (Koschatzky 2005b). The central point of foresight activities is to bring together actors from different sectors, policy fields and levels, thematic and societal backgrounds so that different ideas are introduced and assessed from different points of view. Here appears the possible role of regional foresight as a way to improve the local "social capital" (Koschatzky 2007). Foresight is thus not a single methodology, but different methods

can be mixed to fulfil the purpose. There is a whole range of formal and informal methods to perform the task of looking into the future such as surveys, trend analyses, Delphi studies or different workshop types (Roveda/Vecchiato 2008).

One example of regional foresight is the foresight process of the Provincia Autonoma di Trento (Italy) titled "Capacities, Trends and Opportunities", carried out with support of Fraunhofer ISI in 2003 (Koschatzky 2005a). What turned out here was that interregional policy learning, even based on certain more general paradigms of regional innovation stimulation like the concepts of regional innovation systems (Asheim/Gertler 2005) and the triple helix model of university, industry and government interaction (Etzkowitz/Leydesdorff 2000), took place to a certain extent, but faced major problems because of the regional multi-actor structures. Even in the small region of Trento, with a population of 495.000 inhabitants, a multitude of actors transported own interests, but also interests of groups and systems rooted in and outside the region. As a matter of fact, learning processes by those who were directly involved in the project were interfered by overall political party directives, lobbyism, bargaining processes and own interests of policy makers (Koschatzky 2005a: 636). The Trentinian example showed that foresight is one important but fragile instrument for deriving a regional innovation strategy. Structured and mediated by external support, individuals and interest groups can be brought together who otherwise would not automatically come into an exchange of opinions and information. On the other hand, this mediation is a difficult process and needs diplomatic and tactical skills by which the majority of the involved parties can be convinced to accept and support the achieved results (Gertler/Wolfe 2004: 59). Guides to regional foresight as those published by the European Commission could be of help for structuring the whole process (European Commission 2002), but are no substitute for developing a process adapted to the specific needs and actor constellations of each region.

5   Conclusions

In the context of complex multi-governance structures and with regard to the uncertainty of regional innovation policy, policy makers should be enabled to better learn from own and other experiences. As already pointed out, unadjusted copying of role models and policy measures should be avoided. It is therefore necessary that different policy concepts for which experiences are available in different regional context situations are linked with a comprehensive methodology in order to translate the results into concrete policy decision making (cf. Harmaakorpi 2006 for one possible approach). Tools and guidelines for this translation have to be developed that will enable regional policy makers to identify the most coherent tools related to the impacts they are pursu-

ing and improving the effectiveness, efficiency and alignment of regional innovation policies. The development of these transfer guidelines still constitute a major challenge in the geography of regional innovation and in regional innovation policy, because they could link the fairly imprecise policy conclusions of many theoretical concepts with experiences made in different regions and adjust them to the specific institutional and economic contexts of single regions interested in this kind of knowledge exchange and in this possible input for the formulation of own programmes and measures. One approach could lie in the use of supportive tools and methods which enable policy and decision makers to acquire additional knowledge about alternative approaches, actor and power configurations, and starting points for policy action. The use of evaluation, regional foresight, benchmarking and transregional learning platforms can be important steps into this direction. It could of course not be expected that the application and these tools and methods solves all problems and contributes instantly to the generation of strategic intelligence, but it should be tested whether these tools can give some advice and orientation in regional policy making and could thus contribute to regional policy learning.

6   References

Asheim, B.T./Gertler, M.S. (2005): The Geography of Innovation: Regional Innovation Systems. In: Fagerberg, J./Mowery, D.C./Nelson, R.R. (eds.): *The Oxford Handbook of Innovation*. New York: Oxford University Press, 291-317.

Baier, E./Koschatzky, K./Kroll, H. (2007): *Support to mutual learning and coordination in research policy making (RTD OMC-NET). Deliverable D2.2: Analytical survey of relevant national/regional research and innovation policies*. Karlsruhe: Fraunhofer ISI (http://suppolicy.eu/SupPolicy/documents/documents.html).

Bennett, C.J./Howlett, M. (1992): The lessons of learning: Reconciling theories of policy learning and policy change, *Policy Sciences,* 25, 275-294.

Benz, A./Eberlein, B. (1999): The Europeanization of regional policies: patterns of multi-level governance, *Journal of European Public Policy,* 6, 32-48.

Boekholt, P. (2003): Evaluation of regional innovation policies in Europe. In: Shapira, P./Kuhlmann, S. (eds.): *Learning from Science and Technology Policy Evaluation*. Cheltenham, Northampton: Edward Elgar, 244-259.

Capron, H. (ed.) (2006): *Politique régionale européenne*. Bruxelles: De Boeck.

Charles, D.C.N./Mouton, B./Bradley, D. (2000): *Assessment of the RITTS Scheme, Final Evaluation Report*. Newcastle: CURDS.

Cooke, P. (1992): Regional Innovation Systems: Competitive Regulation in the New Europe, *Geoforum,* 23, 365-382.

El Ouardighi, J./Héraud, J.-A./Kahn, R. (2006): Politique régionale européenne et rôle des collectivités: L'exemple des politiques de recherche et d'innovation. In: Capron, H. (ed.): *Politique régionale européenne*. Bruxelles: De Boeck, 245-273.

Etzkowitz, H./Leydesdorff, L. (2000): The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations, *Research Policy,* 29, 109-123.

European Commission (2001): *Communication from the Commission: The Regional Dimension of the European Research Area*, COM(2001) 549 final. Brussels.

European Commission (2002): *Practical Guide to Regional Foresight*. Brussels/Seville: European Commission (EUR 20478).

Florida, R. (1995): Toward the Learning Region, *Futures,* 27, 527-536.

Freeman, C./Soete, L. (1997): *The Economics of Industrial Innovation. Third Edition*. London: Pinter Publishers.

Gertler, M.S./Wolfe, D.A. (2004): Local social knowledge management: Community actors, institutions and multilevel governance in regional foresight exercises, *Futures,* 36, 45-65.

Harmaakorpi, V. (2006): Regional Development Platform Method (RDPM) as a Tool for Regional Innovation Policy, *European Planning Studies,* 14, 1081-1104.

Hassink, R. (2007): The learning region: a constructive critique. In: Rutten, R./Boekema, F. (eds.): *The Learning Region: Foundations, State of the Art, Future*. Cheltenham: Edward Elgar, 252-271.

Hassink, R./Hülz, M. (2006): *Debating the paradox of interregional institutional learning processes*. Oslo, Luxembourg: Mimeo.

Horvat, M./Guy, K./Demonte Barreto, V./Engelbrecht, J./Wilken, R. (2006): *ERA-NET Review 2006. The Report of the Expert Group*. Brussels: European Commission.

Huggins, R. (2009): Regional Competitive Intelligence: benchmarking and Policy-making, *Regional Studies,* 43 (forthcoming).

Isaksen, A. (2003): National and Regional contexts for innovation. In: Asheim, B.T./Isaksen, A./Nauwelaers, C./Tödtling, F. (eds.): *Regional Innovation Policy for Small-Medium Enterprises*. Cheltenham: Edward Elgar, 49-77.

Johnston, B. (1992): Institutional learning. In: Lundvall, B.-Å. (ed.): *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*. London: Pinter Publishers, 23-44.

Keeble, D./Lawson, C./Moore, B./Wilkinson, F. (1999): Collective Learning Processes, Networking and 'Institutional Thickness' in the Cambridge Region, *Regional Studies,* 33, 319-332.

Kohler-Koch, B. (1996): The strength of weakness: the transformation of governance in the EU. In: Gustavsson, S./Lewin, L. (eds.): *The Future of the Nation State*. Stockholm: Nerius&Santerus, 169-210.

Koschatzky, K. (2001): *Räumliche Aspekte im Innovationsprozess. Ein Beitrag zur neuen Wirtschaftsgeographie aus Sicht der regionalen Innovationsforschung*, Reihe Wirtschaftsgeographie. Münster: LIT Verlag.

Koschatzky, K. (ed.) (2003): *Innovative Impulse für die Region - Aktuelle Tendenzen und Entwicklungsstrategien*. Stuttgart: Fraunhofer IRB Verlag.

Koschatzky, K. (2005a): Foresight as a Governance Concept at the Interface between Global Challenges and Regional Innovation Potentials, *European Planning Studies,* 13, 619-639.

Koschatzky, K. (2005b): The Regionalization of Innovation Policy: New Options for Regional Change? In: Fuchs, G./Shapira P. (eds.): *Rethinking Regional Innovation: Path Dependency or Regional Breakthrough?* New York: Springer, 291-312.

Koschatzky, K. (2007): Social Capital and Cooperation within Innovation Systems. In: Landabaso, M./Kuklinski, A./Román, C. (eds.): *Europe - Reflections on Social Capital, Innovation and Regional Development: The Ostuni Consensus*. Nowy S¹cz: National-Louis University, 134-142.

Kuhlmann, S. (2004): *Governance of Research - The Role of Evaluative Information. Contribution to the CRIS 2004 conference*. Antwerp: CRIS.

Kuhlmann, S. (2001): Future governance of innovation policy in Europe - three scenarios, *Research Policy,* 30, 953-976.

Kuhlmann, S. (2002): *Governance and Intelligence in Research and Innovation Systems*. Utrecht: Universiteit Utrecht.

Lagendijk, A. (1999): The Emergence of Knowledge-Oriented Forms of Regional Policy in Europe, *Tijdschrift voor Economische en Sociale Geografie,* 90, 110-116.

Lambooy, J.G./Boschma, R.A. (2001): Evolutionary economics and regional policy, *The Annals of Regional Science,* 35, 113-131.

Landabaso, M./Oughton, C./Morgan, K. (2001): Innovation Networks and Regional Policy in Europe. In: Koschatzky, K./Kulicke, M./Zenker, A. (eds.): *Innovation Networks - Concepts and Challenges in the European Perspective*. Heidelberg: Physica, 243-273.

Lawson, C./Lorenz, E. (1999): Collective Learning, Tacit Knowledge and Regional Innovation Capacity, *Regional Studies,* 33, 30-317.

Lorenzen, M. (2001): Localized Learning and Policy: Academic Advice on Enhancing Regional Competitiveness through Learning, *European Planning Studies,* 9, 163-183.

Lundvall, B.-Å. (ed.) (1992): *National System of Innovation. Towards a Theory of Innovation and Interactive Learning*. London: Pinter Publishers.

Mackinnon, D. (2002): Learning, innovation and regional development: A critical appraisal of recent debates, *Progress in Human Geography,* 23, 293-311.

Malecki, E. (1997): Entrepreneurs, Networks and Economic Development: A Review of Recent Research. In: Katz, J. (ed.): *Advances in Entrepreneurship, Firm Emergence and Growth*. Greenwich: JAI Press, 57-118.

Marks, G./Hooghe, L./Blank, K. (1996): European integration from the 1980s: statecentric versus multi-level governance, *Journal of Common Market Studies,* 34, 341-378.

Martin, R./Sunley, P. (2003): Deconstructing clusters: Chaotic concept or policy panacea?, *Journal of Economic Geography,* 3, 5-35.

Meyer-Krahmer, F. (1989): *Der Einfluss staatlicher Technologiepolitik auf industrielle Innovationen*. Baden-Baden: Nomos Verlagsgesellschaft.

Meyer-Krahmer, F. (1997): Technologiepolitik. In: Ropohl, D./Schmid, A. (eds.): *Handbuch zur Arbeitslehre*. München: Oldenbourg, 731-752.

Morgan, K. (1997): The Learning Region: Institutions, Innovation and Regional Renewal, *Regional Studies,* 31, 491-503.

Moulaert, F./Sekia, F. (2003): Territorial Innovation Models: A Critical Survey, *Regional Studies,* 37, 289-302.

Mytelka, L.K./Smith, K. (2002): Policy learning and innovation theory: an interactive and co-evolving process, *Research Policy,* 31, 1467-1479.

Nauwelaers, C. (2000): Policy learning for innovation in European regions, paper presented at the RESTPOR conference September 5-7. Kashikojima, Japan.

Nelson, R.R. (ed.) (1993): *National Innovation Systems. A Comparative Analysis*. New York: Oxford University Press.

North, D.C. (1990): *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.

Ohmae, K. (1995): *The end of the nation state: the rise of regional economics*. New York: The Free Press.

Perry, B./May, T. (2007): Governance, Science Policy and Regions: An Introduction, *Regional Studies,* 41, 1039-1050.

Porter, M.E. (1998): Clusters and the new economics of competition, *Harvard Business Review,* 76, 77-90.

Porter, M. (1990): *The Competitive Advantage of Nations*. New York: Free Press Edition.

Renn, O./Thomas, M. (2002): *The Potential of Regional Foresight*, Final Report of the STRATA-ETN Expert Group "Mobilising the regional foresight potential for an enlarged European Union - an essential contribution to strengthen the strategic basis of the European Research Area (ERA)". Luxembourg: European Communities.

Roveda, C./Vecchiato, R. (2008): Foresight and innovation in the context of industrial clusters: The case of some Italian districts, *Technological Forecasting & Social Change,* 75, 817-833.

Saublens, C./Bonas, G./Husso, K./Komárek, P./Koschatzky, K./Oughton, C./Santos Pereira, T./Thomas, B./Wathen, M. (2008): *Regional Research Intensive Clusters and Science Parks. Report prepared by an independent expert group*. Brussels: European Commission, Directorate-General for Research.

Schätzl, L. (2001): *Wirtschaftsgeographie 1. Theorie. 8. Auflage*. Paderborn: Ferdinand Schöningh.

Sternberg, R. (1996): Government R & D expenditure and space: empirical evidence from five industrialized countries, *Research Policy,* 25, 741-758.

Tödtling, F./Trippl, M. (2005): One size fits all? Towards a differentiated regional innovation policy approach, *Research Policy,* 34, 1203-1219.

Uyarra, E./Haarich, S.N. (2002): Evaluation, Foresight and Participation as new Elements for Regional Innovation Policy Practice: Lessons from the Regional Innovation Strategies (RIS), Paper presented at the ERSA 2002 Conference Dortmund. Dortmund.

Uyarra, E./Koschatzky, K./Héraud, J.-A. (2007): Understanding the multi-level, multi-actor governance of regions for developing new policy designs, Position paper the ERASpaces/ERISP projects prepared for the PRIME Annual Conference, Pisa, 29.01.-01.02.2007. PREST, University of Manchester.

van Geenhuizen, M./Reyes-Gonzalez, L. (2007): Does a clustered location matter for high-technology companies' performance? The case of biotechnology in the Netherlands, *Technological Forecasting & Social Change,* 74, 1681-1696.

Wink, R. (2009): Transregional Institutional Learning in Europe: Prerequisites, Actors and Limitations, *Regional Studies,* 43 (forthcoming).

Zenker, A. (2001): Innovation, Interaction and Regional Development: Structural Characteristics of Regional Innovation Strategies. In: Koschatzky, K./Kulicke, M./Zenker, A. (eds.): *Innovation Networks - Concepts and Challenges in the European Perspective*. Heidelberg: Physica, 207-222.

Annex

Table A.1: Toolbox of Policy Measures currently implemented in the EU

Objectives	Target Groups	Policy Measures
1. Improve innovation governance and strategic intelligence for policy making • Strategic vision • Innovation studies • Innovation strategies • Transnational co-operation • Policy learning	policy makers international stake-holders	**Strategic vision** technology foresight regional foresight regional benchmarking regional roadmapping **Innovation studies and evaluations** evaluation of technology and innovation support measures/programmes studies on trans-national learning with regard to regional innovation policy drafting and implementation of national strategy papers on research and development (R&D) **Innovation strategies** national innovation agency streamlining of general legislation to ease R&D activities strategic consortiums for research and innovation PR-campaigns funds for innovation investment in interdisciplinary research **Transnational co-operation** EU framework programme establishment of international networks for mutual learning, especially relevant in border regions
2. Foster an innovation friendly environment • Administrative simplification • Regulatory environment • State aid for innovative firms • Information exchange via e-portals • Boosting technology adoption	enterprises universities and (public) research institutes public sector and administrative representatives innovation agencies employees	**Administrative simplification** streamlining of general national legislation to ease R&D activities removal of bureaucratic barriers to innovation and R&D / administrative reform **Regulatory environment** patent/intellectual property protection royalty exemption **State aid for innovative firms** guarantee schemes for companies performing R&D **Information exchange via e-portals** electronic register of researchers / R&D providers to ease the search for partners electronic register of IP/patents to ease the search for partners support for e-business and IS (information society) related issues **Boosting technology adoption** investment in interdisciplinary research facilitate access of enterprises to skilled personnel

Objectives	Target Groups	Policy Measures
3. Higher Education / Human Capital Development / Gender Issues	higher education institutions	development of infrastructure for education and training support life-long learning initiatives gender specific support programmes
4. Development of Research Infrastructure	higher education institutions public research institutions	funding of public research institutes funding of research facilities in higher education institutes purpose/technology bound funding for public and private research support for the recruitment of top level researchers from abroad / outside the region investment in interdisciplinary research financial incentives for research (competitive project based approach)
5. Strengthen innovation including the protection and commercialisation of intellectual property (IP) • Direct Innovation Support • Innovation skills • Non-technological innovation • Intellectual property protection • Research Commercialisation • Tax incentives • Innovation management • Financing of R&D and innovation	enterprises	streamlining of general national legislation to ease R&D activities evaluation of RTDI support measures / programmes **Direct Innovation Support** public support schemes for buying technological equipment public support schemes for companies performing R&D **Innovation skills** public support schemes for the temporary hiring of qualified personnel for R&D, marketing etc. public support schemes for the temporary hiring of young graduates and foreign graduates support for qualification/skill development of industrial R&D employees support for industrially orientated qualification of university / public research employees – e.g. for PhD candidates focusing the theses on topics relevant for the private sector support for the recruitment of top level researchers from abroad / outside the region **Non-technological innovation** public support schemes for introducing organisational innovations support of knowledge-intensive business services subsidies to increase internationalisation of (innovative) small and medium-sized enterprises (SME) **Intellectual property protection** IP protection support patent/IP protection royalty exemption **Research Commercialisation** support for university-industry technology transfer

Objectives	Target Groups	Policy Measures
		establishment of centres that deal with necessary bureaucratic formalities for the companies for free ('one stop shops', 'reduction of red tape') **Tax incentives** tax deductibility of R&D expenditure – in some case to more than 100% general tax relief for R&D related investment exemption from VAT exemption from corporate income tax (especially for SME) **Innovation management** public provision / support for the outsourcing of research services for SME support for standardisation and quality management issues (ISO certification) **Financing of R&D and innovation** support schemes by public promotional banks and selected private banks
5. a) Strengthen entrepreneurial innovation in the SME sector	enterprises (SME) public sector banking/financial sector	public support schemes for SME performing R&D public support schemes for the strengthening of the competitiveness of SME voucher systems for consultancy and training technology/innovation prizes/competitions
5. b) Industrial policy and strategic technology policy	Multi-national enterprises co-operations	large lump-sum support for projects in certain industries or technology fields support for large international projects purpose/technology bound funding for public and private research public support schemes for introducing organisational innovations public support schemes for the temporary hiring of young graduates and foreign graduates public support schemes for companies performing co-operative R&D (between public and private sector) support for R&D co-operations with players in other more advanced countries financial incentives for research (competitive project based approach)
6. Encourage technology and knowledge transfer to enterprises and development of innovation poles and clusters • Recruiting innovators • Technology transfer	enterprises public research institutes universities policy makers (on regional level)	streamlining of general national legislation to ease R&D activities PR-campaigns **Recruiting innovators** establishment of information centres for companies considering to perform R&D and/or to apply for public support **Technology transfer** spin-off support support for university-industry technology transfer

Objectives	Target Groups	Policy Measures
• Innovation intermediaries • Innovation infrastructure • Co-operation and Networking • Cluster management		IP protection support establishment of incubators for the general public establishment of university and public research based incubators establishment of technology transfer centres **Innovation intermediaries** financial assistance to non-public or public-private institutions supporting innovative activity **Innovation infrastructure** funding of public research institutes investment in interdisciplinary research subsidies to increase internationalisation of (innovative) SMEs **Co-operation and networking** public support schemes for companies performing R&D in complex and sustainable networks support for R&D co-operations with players in other more advanced countries public provision / support for the outsourcing of research services for SME trade fair/conference support establishment of international networks for mutual learning, especially relevant in border regions **Cluster management** support for Network Schemes/Cluster Development (nationally and regionally driven, implementation however mostly on a regional level) knowledge management in networks establishment of centres that deal with necessary bureaucratic formalities for the companies for free ('one stop shops', 'reduction of red tape')
7. Promote and sustain the creation and growth of innovative enterprises • Funding innovative start-ups • Entrepreneurship support infrastructure • Leveraging private innovation finance • Optimising financial regulations	students general public banks/financial sector universities and public research	round table initiatives (intermediaries, banks, entrepreneurs, firm representatives, ministerial representatives) **Funding innovative start-ups** funds for innovation **Entrepreneurship support infrastructure** spin-off support set-up of public private partnerships to provide small private enterprise with access to credit entrepreneurship education / entrepreneurship awareness programmes PR-campaigns business plan competitions technology/innovation prizes/competitions

Objectives	Target Groups	Policy Measures
		Leveraging private innovation finance / Optimising financial regulations purpose bound fund i.e. for technology commercialisation venture capital schemes with public backing seed financing start-up financing risk financing

Source: Compilation based on Baier et al. (2007)

The series "Working Papers Firms and Region" presents research work of the Competence Center "Policy and Regions" of Fraunhofer Institute for Systems and Innovation Research (Fraunhofer ISI), Karlsruhe, Germany.

No.	Authors	Title
R6/2009	Knut Koschatzky	The uncertainty in regional innovation policy: some rationales and tools for learning in policy making
R5/2009	Bärbel Hüsing Thomas Stahlecker	The impact of regionalised RTDI policy measures in Germany: The "Network RNA Technologies Berlin (RiNA)" as an example
R4/2009	Knut Koschatzky Elisabeth Baier Henning Kroll Thomas Stahlecker	The spatial multidimensionality of sectoral innovation – the case of information and communication technologies
R3/2009	Knut Koschatzky Thomas Stahlecker	Cohesion policy at the interface between regional development and the promotion of innovation
R2/2009	Henning Kroll	Spillovers and Proximity in Perspective A Network Approach to Improving the Operationalisation of Proximity
R1/2009	Henning Kroll	The Regional Development of Science and Innovation in China – A Brief Review of Current Evidence on Matches and Mismatches –
R3/2008	Arlette Jappe-Heinze Elisabeth Baier Henning Kroll	Clusterpolitik: Kriterien für die Evaluation von regionalen Clusterinitiativen
R2/2008	Arlette Jappe-Heinze Knut Koschatzky	The spatial embeddedness of multinational enterprises' research activity - A bibliometric analysis
R1/2008	David Doloreux Andrea Zenker Emmanuel Muller	Services à forte intensité de connaissances, contexte régional et comportements d'innovation: une comparaison internationale
U1/2007	Emmanuel Muller David Doloreux	The key dimensions of knowledge-intensive business services (KIBS) analysis: a decade of evolution
R1/2007	Knut Koschatzky Vivien Lo	Methodological framework for cluster analyses
U1/2006	Björn Wolf	Empirische Untersuchung zu den Einflussfaktoren der Finanzierungsprobleme junger Unternehmen in Deutschland und deren Auswirkungen auf die Wirtschaftpolitik

No.	Authors	Title
R1/2006	Emmanuel Muller Arlette Jappe Jean-Alain Héraud Andrea Zenker	A regional typology of innovation capacities in New Member States & Candidate Countries
R1/2005	Björn Wolf Birgit Ossenkopf	Kapitalschonende Entwicklungswege – Ansätze zur Lösung der Finanzierungsprobleme junger innovativer Unternehmen
R2/2004	Thomas Stahlecker Knut Koschatzky	On the significance of geographical proximity for the structure and development of newly founded knowledge-intensive business service firms
R1/2004	Thomas Stahlecker Andreas Koch	On the Significance of Economic Structure and Regional Innovation Systems for the Foundation of Knowledge-Intensive Business Services A Comparative Study in Bremen, Munich, and Stuttgart, Germany
R1/2003	Bodo Kubartz	Wirtschaftliche, soziale und geographische Aspekte in Innovationsnetzwerken – Eine Untersuchung des Nähekonzeptes am Beispiel von Forschungs- und Entwicklungsdienstleistern
R2/2002	Knut Koschatzky	Innovationsorientierte Regionalentwicklungsstrategien: Konzepte zur regionalen Technik- und Innovationsförderung
R1/2002	Ralph W. Bruns Jens Görisch	Unternehmensgründungen aus Hochschulen im regionalen Kontext – Gründungsneigung und Mobilitätsbereitschaft von Studierenden
U1/2001	Rana Adib Frank Gagelmann Knut Koschatzky Klaus Preiser Günter Hans Walter	An Integrated Microfinancing Concept for Rural Electrification by Photovoltaics in Developing Countries
R3/2001	Knut Koschatzky	The role of higher education institutions for entrepreneurship stimulation in regional innovation systems – Evidence from the network-oriented "EXIST: Promotion of university-based start-ups" programme in Germany
R2/2001	Emmanuel Muller Andrea Zenker	Business services as actors of knowledge transformation and diffusion: some empirical findings on the role of KIBS in regional and national innovation systems
R1/2001	Knut Koschatzky Casper Merkle Martin Berger Volker Meyer	Innovation und Kooperation bei unternehmensnahen Dienstleistern in Baden, Gironde und Südholland – Ein Vergleich zwischen jungen und alten Betrieben
R2/2000	Ulrike Broß Günter H. Walter	Socio-economic Analysis of North Rhine-Westphalia Joint Research Project INCO-COPERNICUS

No.	Authors	Title
R1/2000	Knut Koschatzky	The regionalisation of innovation policy in Germany – Theoretical foundations and recent experience
R4/1999	Knut Koschatzky Ulrike Broß	Struktur und Dynamik von regionalen Innovations-netzwerken unter Transformationsbedingungen – das Beispiel Slowenien
R3/1999	Emmanuel Muller	There is no territorial fatality! (or how innovation interactions between KIBS and SMEs may modify the development patterns of periph-eral regions)
R2/1999	Knut Koschatzky Andrea Zenker	The Regional Embeddedness of Small Manufacturing and Service Firms: Regional Networking as Knowledge Source for Innovation?
R1/1999	Ulrike Broß Knut Koschatzky Peter Stanovnik	Development and Innovation Potential in the Slovene Manufacturing Industry First analysis of an industrial innovation survey