

2. Regional Innovation Policies: European Experiences and Concepts

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1. Introduction

Although a great deal of literature deals with national systems of innovation (Lundvall 1992: Nelson 1993), it is the regional (subnational) system of innovation which is growing in importance in Europe today (Cooke 1998: Paquet 1994). Many regions(subnational entities) in Europe have started to set up technology centres, science parks, technopoles and technology transfer and advice agencies in the second half of the 1980s.

The ideas for these regional innovation policies are mainly derived from successful regional economies, such as Baden - Wuerttemberg in Germany and Emilia - Romagna in Italy, which are based on regional networks of firms and institutions providing a fast diffusion of information and thus leading to a great chance that inventions will become successful innovations.

This paper aims at giving an overview of the latest experiences and concepts in Europe concerning regional innovation policies. It is based both on a review of recent literature and on insights gained by the author from various research projects carried out on this topic(Hassink 1993: Hassink 1996). In section 2 the reasons why regional innovation policies emerged in Europe will be explained. Then the paper will present some lessons learned from experiences made in Europe with regional innovation policies. Section 4 will deal with recent theoretical regional innovation policy concepts developed in Europe, whereas in the final section 5 the potential importance of European experiences and concepts for South Korea will be discussed.

2. The emergence of regional innovation policies in Europe

Since the mid - 1980s the importance of the regional level for innovation policies has strongly increased in many European countries. These emerging regional innovation policies can be regarded as all measures in regions to stimulate the innovativeness of firms. The central aim of these policies is to support regional endogenous potential by encouraging the diffusion of new technologies in general and the diffusion of new technologies from higher education institutes (HEIs) and public research establishments (PREs) to small and medium - sized enterprises (SMEs) in particular. but also between SMEs and large enterprises (vertical co - operation) and between SMEs themselves(horizontal co - operation). These regional innovation policies consist of three groups of measures. First, technological aid schemes support the innovativeness of firms financially. Secondly, physical infrastructure such as science parks, technopoles and technology centres has been built to provide high - tech companies. R&D centres and

technology - oriented business start - ups with attractive sites. Thirdly, intermediary institutions between HEIs and PREs and SMEs have been set up and now form a technology transfer and advisory infrastructure. This paper will particularly focus on this last group, as it is considered to be the core of regional innovation policies (Asheim & Isaksen 1997; Lagenkijk & Charles 1998; Pyke 1994).

There are three main explanations for the emergence of regional innovation policies in many European countries since the mid - 1980s.

First, in general terms, technology and regional policies have gradually converged since the early 1980s as a result of changing strategies (Hassink 1993; Rothwell & Dodgson 1992). During the 1960s and 1970s, technology policy in Western Europe mainly focused on stimulating large technological projects in large companies (national champions) and PREs. Then, in the early 1980s, central governments in Western Europe realised that these policies ignored SMEs and the diffusion of technological knowledge from basic science to industrial applications. They tried to overcome these shortcomings by launching financial aid programmes to stimulate the innovative capacity of SMEs and their use of new technologies. In addition, regional technology transfer and advice agencies were established to inform SMEs about these aid programmes on the spot and to foster technology transfer from HEIs and PREs to SMEs. In regional policy a similar change occurred between the 1960s and the 1980s. In the 1960s and 1970s, extensive regional policy programmes in Western Europe aimed to improve the economy of declining regions by encouraging the relocation of economic activities from strong to weak areas. Although these policies succeeded in attracting inward investment to structurally weak regions, they did not reduce regional economic inequalities, as intended, because externally - controlled production plants often lacked innovative capabilities and links with regional suppliers. These drawbacks were recognised by central governments who increasingly started to focus on a new concept: the indigenous potential strategy. This new policy extended the search for an external solution to regional problems with a search for internal solution within the region. Since the new focus was on existing indigenous companies, regionally - orientated SMFs became a target for support through, among others, subsidies for science parks, technology centres and technology advice and transfer agencies. Thus, technology and regional policies converged since their aim became partly the same, namely supporting the innovative capabilities and thus competitiveness of SMEs.

Secondly, the surge in regional innovation policies can be related to more general socio - economic changes such as the shift from mass production to flexible specialisation and the transition from Fordism to post - Fordism (Malecki 1991). The changing organisation of production is said to have increased the importance of the regional level for economic development, since vertical disintegration (increase in outsourcing) and decentralisation of large companies into smaller units led to more inter - firm networking and learning in which the socio - cultural and regionally induced trust relations are crucial. Not only did regions gain a greater economic importance, but it has also become clear that the changes that occurred in production organisation needed to be accompanied by changes in economic policy and institutional environments of firms, including an increasing policy role for regions, the support of information diffusion through technology transfer agencies and public - private partnerships. Furthermore, the increasing role of regions in supporting innovation can be understood if one considers the postulated 'end of the nation - state' induced by an increasing economic globalisation. Although the increasing importance of the regional level for economic and technological growth has been much disputed (Amin & Robins 1990), there is much more consensus about its increasingly meaningful role for innovation policy (Morgan 1997; Koschatzky 1995).

Thirdly, a specific European explanatory factor for the emergence of regional innovation policies is the increasing attention regions received during the integration process of Europe. The European Union as a supra - national organisation has increased its power, whereas national economic policies in Western Europe, on the other hand, lost influence. Furthermore, the European Commission launched several programmes in order to support the regional level for innovation policies, which will be presented in more detail later on in this paper.

3. Recent regional innovation policy experiences in Europe

Although the rise of regional innovation policies in Europe cannot be disputed as a general phenomenon, there are of course large differences between individual regions and countries concerning the extent to which this policy trend takes place.

This phenomenon is partly caused by the different political - administrative systems that can be found in the countries of Europe. In countries with a federal or similar political system such as Germany, Austria, Spain and

Belgium, regional authorities have a stronger position to devise and implement their own regional innovation policies than regions in countries with a relatively centralised political system, such as the Netherlands, Denmark and Great Britain. In addition, the different size of the countries and regions of Europe affects their critical mass for a demand of regionalized forms of innovation policies. Offering a regionalised form of regional innovation policies makes less sense in Denmark, a country with five million people, than in the much larger Germany, with 80 million people. Particularly large countries with many SMEs and strong regional economic inequalities are suited for a regionalised and thus more customised innovation support system.

Secondly, strong industrial specialisation at a regional level can strongly contribute to the existence of regionally organised institutional innovation support for companies. In some countries where regions have relatively little political power, such as Italy, but where we can find extreme concentrations of particular industries in industrial districts, dense institutional support set - ups have been created during the years. Therefore, in regions with a strong industrial specialisation, it is more likely to find stronger regional innovation policies.

Thirdly, socio - cultural homogeneity and thus trust relationships enable firms to start network relations in which mutual benefits are expected from co - operation with other firms, but also with institutions. In such an environment one can expect a larger financial input from firms in support institutions, as companies trust that every company will benefit to the same extent from these commonly developed institutions.

Despite the differences between individual countries and regions in Europe concerning innovation support organised at a regional level, common strengths and weaknesses of these kinds of policies can be observed.

One of the main strengths of this level for innovation support has been called the "garden argument"(Paquet 1994): if the economy is regarded as a garden with all kinds of trees and plants, for the gardener(government) there is no simple rule likely to apply to all plants. Growth is therefore not best nurtured from the centre, but best nurtured from its sources at the level of cities and regions. At this level policy - makers are much closer to the demand of firms: policy can be tailored to demand. Regionalisation, therefore, allows for differentiation in policies, which is necessary because of regional economic heterogeneity.

Secondly, because of the large variety of institutional set - ups and initiatives in Europe, this laboratory of regional innovation policy experimentation offers regional policy - makers in Europe and other parts of the world plenty of interregional institutional learning opportunities.

Looking at the weaknesses of regional innovation policies in Europe, one of its main deficiencies is the lack of official evaluation studies done on the impact of these policies on regional economic development. What is worse, other studies on companies' external technology sources have shown low scores for technology transfer advice agencies and other intermediary institutions(Hassink 1996). Instead, business partners, particularly customers and suppliers, are the leading stimulants for innovations. Paradoxically, technology - following SMEs, the target group of transfer and advice agencies, tend to ignore transfer agencies, whereas structurally strong and outward - looking SMEs, companies that will find their way also without much government - funded support, tend to use them.

In addition to the lack of the impact of the policies, many regions also suffer from functional overlap and duplication of tasks. Partly due to multilevel(European, national, regional, local) funding and devising of policies, policy co - ordination at the regional level is difficult to realise. Therefore, many regions have not been able to organise agencies in such a way that they are tailored towards the needs of firms in the region(Hassink 1996). They lack a clearly defined innovation strategy with industry involvement, placed in a proper national and international context. Partly because of this lack or absence of strategy, we can find too many agencies in the regions which refer relatively little to each other so that in many cases we can only speak about a support infrastructure, not about a support network. In such an environment SMEs tend to be frustrated, as they do not know whom to contact with their problems.

The main policy reaction to this latter weakness came from the European Commission when it launched several support programmes for regions from 1994 onwards. These programmes, called Regional Innovation and Technology Transfer Strategies and Infrastructures(RITTS), Regional Technology Plans(RTP) and Regional Innovation Strategy (RIS) Programmes, aim at supporting regions in Europe to (re)organise their innovation policies in order to meet the demands of firms more than they did before (Nauwelaers et al. 1996; Ried 1996). These programmes can be

characterised as bottom - up, as they are demand - driven and carried out in exchange with SMEs, regional, as they are built on a consensus at the regional level, strategic, as they are based on a regional plan with socio - economic objectives, integrated, since both public and private sectors are involved, and international, as interregional institutional learning between regions in Europe is a specific aim.

The first reflections on the impacts of these programmes on the regions' capacities to organise and co - ordinate innovation policies are positive(Reid 1996: Nauwelaers et al. 1996: Morgan 1997). Based on first evaluating observations of the RTP programme experiences in three pilot regions(Limburg, the Netherlands, Lorraine, France and Wales, Great Britain), Nauwelaers et al.(1996) recommend regions to define regional priorities first. Only after having got a better understanding of the regional situation and a definition of priorities (intraregional learning), one should become involved in external exchanges on the basis of the results achieved internally(interregional learning).

Politically weak regions, such as the English regions, seem to benefit most from these European support programmes for setting up regional innovation policies. Strong regions, such as the German Laender, do not see the need for support from Brussels, as they have already an established and more or less well co - ordinated regional innovation policy. By supporting the politically weak regions most, these programmes, therefore, seem to contribute to a truly Europe - wide surge of regional innovation policies and strategies.

4. Regional innovation policy concepts

After regional innovation policies have been emerging since the mid - 1980s, academics have been starting to develop theoretical and conceptual ideas on regional innovation strategies since the mid - 1990s. Concepts such as the learning region, regional innovation systems and institutional thickness have recently been launched by European scholars. These concepts have been partly developed for policy reasons, namely as a response to the regions' organisational and strategic weaknesses described above. By developing these concepts, scholars also wanted both to derive conceptual policy lessons from successful economies in regions such as Emilia - Romagna and Baden - Wuerttemberg and to make clear why the regional level is an important level as a source for learning and innovation.

The learning region concept can be understood as a regional development concept in which the main actors (politicians, policy - makers, chambers of commerce, trade unions, HEIs, PREs and companies) are strongly, but flexibly connected with each other. Morgan(1997) calls learning regions the new generation of regional policy, which, compared to traditional regional policy, focuses on infostructure instead of infrastructure, on opening minds instead of opening roads and branch plants and which devises policies with SMEs instead of just policies for SMEs. Learning regions are further characterised by a bottom - up approach, transparency, face - to - face relations, integrated solving of problems(crossing of policy fields), integration of policy, social and company networks and permanent organisational learning with feedback effects. These networks are open to learning, both to intraregional and interregional learning. These regions "are prepared, as it were, to change a winning team"(Cooke & Morgan 1994: 91). Policy in such learning regions is not focused on individual firms and once - and - for - all solutions, but instead it is context - sensitive and focused on continuously adapting regional economic capacities(Asheim & Isaksen 1997).

Butzin(1996) considers the concept of the learning region as a seedbed or context for a comprehensive innovative milieu, a milieu which cannot be created directly by policy - makers. Flanked with the right measures, this concept enables a region to enhance the probability of spontaneous development of local and regional creative milieus, both economically, socially and politically. The innovation policy of a 'learning region' contains more than just supplying technological knowledge. Support is certainly also needed to enhance the capacity of SMEs to accept, absorb and adapt this knowledge in a useful way. In addition, Butzin(1996) stresses the need for qualification measures for regional policy - makers and institutional actors, which should not focus on the traditional concrete expert knowledge, but on the readiness and capability to learn and to 'network'(Butzin 1996). Thus, Butzin(1996) considers "ultra soft" location factors, next to soft and hard location factors, as being of increasing importance to explain regional innovation capabilities: the regional "socio - culture" is the engine of learning and innovative capability, knowledge and competence are its fuel and network architectures and networking quality of persons are its navigators.

Although partly based on empirical insights(Morgan(1997) in Wales, Great Britain, and Butzin(1996) in the Ruhr Area, Germany), the learning region concept is in fact a conceptual model. Regional innovation systems, on the other hand, are more operational in character. In a recently published book, for instance, 14 different concrete regional innovation systems are presented(Braczyk et al. 1998). Cooke et al.(1997) see regional innovation systems as

learning regions with an added financial capacity. In contrast, Asheim(1998) sees learning regions as a broader concept than regional innovation systems. In other words, there is no consensus yet on what distinguishes the concepts from each other. In my view, however, the regional innovation system concept is a slightly broader concept than the learning region, as it contains more regional actors that have some impact on innovation than the learning region, which is more focusing on innovation support institutions. Cooke & Schienstock(1996:11) define a regional innovation system as "geographically defined, administratively supported arrangement of innovative networks and institutions that interact regularly and strongly to enhance the innovative outputs of firms in the region. Such a network is composed of institutions such as research institutes, universities, technology transfer agencies, chambers of commerce, banks, government departments, individual firms as well as firm network and industry clusters". The aim of regional innovation systems, similar to that of learning regions, is to integrate traditional, context - linked, regional knowledge and codified, worldwide available knowledge in order to stimulate regional endogenous potential(Asheim & Isaksen 1997).

As the regional innovation concept is comprehensive but vague, attempts have been made to make typologies of it in order to come closer to reality.

Asheim & Isaksen(1997), for instance, categorise regional innovation systems into two types. First, the regionalised, national innovation system represents a system in which parts of the regional production structure and institutional infrastructure in a region functionally belong to the national innovation system(examples are large PREs, technopoles or science parks that are often implemented into the region in a top - down way and that are thus limitedly anchored in the region). Secondly, in a regionally embedded innovation system both the regional production structure and institutional infrastructure are embedded in the region, both established in a bottom - up way.

Cooke(1998:12), who is clearly seeing the advantage of the systems approach in its role as framework for comparison, develops a typology with that aim on the basis of two key dimensions: the governance infrastructure (grassroots systems, network systems and dirigiste systems) and the business superstructure (localist systems, interactive systems and globalised systems). The aim of the typology is to understand the similarities and differences between regions in terms of the level of institutionalisation and the extent to which systems are present at all.

With their concept of "institutional thickness", Amin & Thrift(1994) take up many topics which are central in the discussions around learning regions and regional innovation systems. They differentiate themselves from these other concepts by taking the thickness of institutional set - ups as the starting - point of their analysis. The discussion about institutional thickness started after scholars found out that successful industrial districts, such as the Third Italy and Baden - Wuerttemberg, are characterised by a 'thick' tissue of support institutions. Amin & Thrift(1994) define institutional thickness as the combination of factors including inter - institutional interaction and synergy, collective representation by many bodies, a common industrial purpose, and shared cultural norms and values. Thickness both establishes legitimacy and nourishes relations of trust. Many authors, however, point to the fact that institutional thickness cannot only be associated with successful regional development: thick layers of institutions can be found in structurally weak regions, such as old industrial areas, as well. Hudson(1994), for instance, states that the culture of dependence of old industrial areas was sustained through the particular and thick institutional tissue of such areas.

Institutional thickness also plays a role in discussions about which organisation of regional technology transfer and advice infrastructures serves regional economic development best(Hassink 1996). A continuum can be noticed between two contrasting opinions, streamlining ('one - stop' shops) which leads to fewer actors and more co - operation between them, on the one hand, and the redundancy concept(Grabher 1994) which states that institutional framework should be fragmented with overlap, on the other hand(institutional thinness versus institutional thickness). Whether institutional thickness is beneficial or harmful to regional economic development, however, seems not so much a question of the sheer number of institutions or the way they individually work, as rather a question of how and in which framework they are organised(Pyke 1995: Braczyk & Heidenreich 1998). According to Amin & Thrift (1995:56): "it is often the act of building these institutions in an open, inclusive way which is more important for a region's governance capacity than the actual institutions themselves". Institutional and industrial relations should be structured at a regional level in such a manner that a substantial degree of synergy is generated for regional players. The learning region or regional innovation system concept could contribute to achieving such internal institutional coherence and compatibility in regions.

One should keep in mind, however, that because of the evolutionary character of the above described regional innovation policy concepts, there is not such a thing as an optimal system of innovation or one best way. They are constantly in evolution or as Edquist (1997:20) writes: "we cannot define an optimal system of innovation because evolutionary learning processes are important in such systems and they are thus subject to continuous change. The system never achieves an equilibrium since the evolutionary processes are open ended and path dependent".

5. Outlook on South Korea

During the last decade we have seen an increasing importance of the regional level for innovation and technology policy in Europe. Besides that, academics started to develop regional innovation concepts, such as the learning region and regional innovation systems, both to conceptually support this policy trend and to prove the importance of the regional level for industrial learning, innovation and hence competitiveness. What do these developments mean for South Korea?

In recent years South Korea is undergoing a change of its institutional framework and the content of its industrial, technology and regional policies. This has been necessary to achieve the restructuring of its economy from a low - technology, labour - intensive, mass production' type of industry to a high - technology, capital - and skill - intensive, 'flexible specialisation' type of industry (Porter 1990). Therefore this involves a shift in emphasis from hierarchical control to decentralised governance, both at the level of the state and at the level of the firm. Concerning regional policy, it has been argued that policy should be changed away from 'top - down' decentralisation policies, mainly implemented in the 1970s (large - scale heavy industrial complexes in the south - eastern part of South Korea) and 1980s (the relocation of mainly public research establishments (PREs) to science parks and technopoles such Taedok Science Town (Oh 1995). In turn, 'bottom - up' decentralisation policies of developing endogenous potentials (mainly SMEs) in regions are regarded as the way forward (Oh 1995; Hong 1997). Decentralised governance does not only mean a less interventionist central state and an implementation of centrally controlled authorities into the regions, it should also involve a devolution of power and resources to regions, so that they are able to set up a sound institutional support infrastructure for SMEs. Theoretical concepts, such as industrial districts, innovative milieux, and more recently launched regional development concepts, such as the above described regional innovation system and learning region concepts nourish these ideas.

Bottom - up regional policy has been fostered by reforms in March 1995, which led to more autonomy for local authorities to devise and implement their own economic development policies. Until then, local and regional authorities were little more than executive branches of the central government (Kim 1995). Since then, regional governments have been starting to devise technology policies so that "Korea is in the beginning stage of regional S&T policy" (Chung & Lay 1997:681). Although there are now both more planning capacities and ambitious plans at a regional level, local and provincial authorities lack enough possibilities to levy taxes and hence financial resources to realise their plans. Moreover, the support infrastructure in many regions is regarded as highly fragmented, with overlapping activities and lacking horizontal co - ordination due to strong vertical ties with upper - tier authorities (Kim 1995).

Concerning the strength of the Korean SME - oriented innovation support, we can find contradicting statements in the literature. According to the OECD (1996:173) "it is surprising that there seems to be no systematic establishment of technical assistance offices throughout the territory ... of the sort to be found in a number of European countries ... or even in Japan", whereas Kim & Nugent (1994) have identified South Korea as an international leader in SME - oriented innovation support systems. Both sources, however, agree on the fact that "following practices in most ... OECD countries, the development of infrastructures and programmes to support technology needs to involve local and regional authorities" (OECD 1996:174; Kim & Nugent 1994).

As Korea is just entering the road to regional innovation policy, there are thus good reasons for Korean policy researchers and policy - makers to monitor regional innovation policy trends and concepts in Europe. The RTP/RIS/RITTS programmes have meant a new boost for regional innovation policies in Europe and have led to a wealth of experiences from which South Korea certainly could learn. There are two reasons why a focus on Great Britain might be particularly interesting.

First, Great Britain's highly centralised administrative system resembles the South Korean one. Also Great Britain's regions used to suffer from a lacking capacity to co - ordinate the many innovation support initiatives that were initiated both at national, regional and local level (Hassink 1993). However, with the help of the European

programmes mentioned above and partly the new Labour government, many regions in Great Britain make good progress in streamlining and strengthening their strategies.

Secondly, both South Korea's and Great Britain's regions are to a large extent dominated by branch plants of large enterprises. Some of Britain's regions have recently been successful in promoting branch plants' embeddedness into the regional economy. Wales, for instance, managed to increase co-operation networks between branch plants and regional SMEs due to innovative policies (Morgan 1997). Since South Korea has too many satellite and hub-and-spoke industrial districts with relatively little intraregional networking (Park 1995), it needs policy strategies in order to promote the formation of innovation networks between large companies, SMEs, regional HEIs, PREs and other innovation support institutions.

Kim (1997:13) recently pointed out the chance of the current economic crisis being possibly an accelerator of these needed institutional reforms as he stated: "Decentralization will empower regional governments to take initiatives in strengthening support for SMEs in their regional innovation system ... Such changes are imperative but slow to come under normal circumstances. But they may be expedited under a crisis condition". The coming years will show whether the current crisis will accelerate or slow the development of regional innovation policies in South Korea.

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