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Balancing Between Competitiveness and Cohesion in Innovation

The case of the regional innovation policy evolution in Finland

**Inclusive Growth, Innovation and Technological Change:
education, social capital and sustainable development?**

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1. Introduction

A surge in understanding the importance of innovation as a key competitive asset has in its wake also highlighted the potential to intentionally nurture environments and measures conducive for innovations to emerge and to create economic value, i.e. innovation policy. As innovation activities and needed resources are unevenly distributed to economic space, the possibilities and starting-points for innovation policy also vary between localities. This usually led national and regional policy-making in the beginning to focus on the most obvious and attractive targets of innovation policy: the high technology industries and science and technology-based innovations. During the last decade or so, nevertheless, this narrow focus has made way for a broader focus of policy due to, among other things, increased understanding of innovation and pure necessity of striving to support innovativeness also in environments lacking those highly esteemed industries and prerequisites for them. At the same time, innovation policy has had to take into account the heterogeneous innovation environments and also the social consequences of innovation policy (Lundvall & Borrás 1997; Sharp 1998; Howells 2005; Fritsch & Stephan 2005).

Finland has built up a reputation for its innovation system and policy. Internationally it is renowned especially for its national achievements. Nevertheless, for almost two decades there have been continuously going on a transformation also in the regional innovation policy that have resulted in a considerable emergence of new structures, institutions and processes aiming at milieus conducive for innovation at the local and regional level. During a relatively short period of time, the Finnish regional innovation policy has gone through numerous changes and its rationale and goals have substantially altered. One of the most fundamental questions relates to the balance between regional competitiveness and cohesion. As stated in this paper, there has been made major efforts to create an innovation system that would enable both these goals to be achieved, but that recent policy-making leaves some doubts whether this sensitive balance would have been put into a secondary position as a goal in favour of national competitiveness.

The paper attempts to shed light on the relationship and tension between regional competitiveness and cohesion as undercurrents and continuous cause of controversies in the regional innovation policy. Empirically the paper aims at outlining the main phases of evolution and drivers of development in the Finnish regional innovation policy. It also discusses the most recent developments from the perspective of regional (and national) competitiveness and cohesion nexus.

The paper is organized as follows. In Chapter 2, it is first briefly scrutinized some of those key reasons for the importance of the immediate local environment for innovation activities. Next, a definition and role of the regional innovation policy is presented and discussed. Finally, the in-built problems of the regional innovation policy are contemplated that are born out of this policy being essentially a synthesis of different policy areas with different rationales. Chapter 3 broadly outlines in the Finnish context the emergence and development of the policies related to the regional innovation policy, and leading to an emergence of it. Chapter 4 concentrates on the developments occurred after the actual formation of the regional innovation policy in the mid-1990s. Both the key institutional changes and the main drivers of these changes are discussed. The last Chapter (5) summarizes the main milestones and outlines the major phases of development, and aim at interpreting and discussing the main findings from the perspective of regional (national) competitiveness and cohesion.

2. Between competitiveness and cohesion: regional innovation policy

In this Chapter, a definition and role of the regional innovation policy is discussed. Before that, a rationale to conduct such a policy is briefly scrutinized. Finally, the in-built problems of the regional innovation policy are contemplated that are born out of this policy being essentially a synthesis of different policies with different rationales. The lengthy discussion on general rationale for public intervention has intentionally left aside here (see e.g. Laranja et al. 2008).

Innovation environment as a source of opportunities, resources and competences

In order to be able to create innovations, a firm usually needs to complement its internal competences by acquiring external competences, and as innovations tend to be increasingly complex and their commercialization also demands highly sophisticated expertise, a firm's capability to access external competences is crucial for its competitiveness (see e.g. von Hippel 1988; Cohen and Levinthal 1990; Teece and Pisano 1998; Chesbrough 2003). It is noted that firms' innovation environments vary to a great extent – some firms are positioned more favourable than others to become aware of their innovation needs, to access and acquire external competences and to turn these acquired competences into commercialized innovations (Cooke 2004). It has been claimed (Porter 1998), for example, that a firm located in a cluster – with a same specialization than a firm – has an advantage over a competing firm located outside of a cluster. Local demand, or a lack of it, may also put firms in different competitive positions and create considerable innovation dynamics. Thus, a development of a variety of demand-side policy instruments is recently called forth (Edler and Georghiou 2007).

Innovation environment as a cognitive and normative basis

It is often not recognized that in addition to resources, competences and demand, an innovation environment consists also of some more abstract elements which nevertheless are not necessarily less important: Values, norms and role models, among other things, have a considerable impact on individuals and organizations in their proximity whether this proximity is geographical or, for example, economical (see e.g. Torre & Rallet 2005). Firms often imitate other, successful firms' strategies and practices, and the smaller the firm, the more important immediate vicinity. This can be seen, for example, in Finland where the rate of growth firms ("gazelles") is the biggest in the regions of Ostrobothnia (KTM, 2006) which are traditionally recognized by their specific entrepreneurial values, whereas in the small cities around the country with homogenous industrial structure (e.g. dominated by large plants of the pulp and paper industry) no any significant new businesses have emerged highly probably due to deeply rooted cognitive and normative models (Kautonen 2008). This puts regions in different positions according to their innovativeness and poses often a greater challenge for regional innovation policy than a "mere" lack of financial and knowledge-related resources.

Defining regional innovation policy

It is hard to find any definition for regional innovation policy, probably partly because the scope of the policy domain is far from being established and varies from country to country. Concerning innovation policy, Dodgson and Bessant (1996, 4) define that the goal of innovation policy is to enhance innovation capability of firms, networks, industries and entire (regional and national) economies. They continue that as innovation is a process which involves flows of technology and information between a variety of actors, a central task of innovation policy is to foster these flows and related interactions. At the regional level, this puts focus, on the one hand, on building innova-

tion capabilities on a firm and system levels and, on the other hand, seeking for ways to enhance knowledge flows both internally and externally to the region.

Nevertheless, this is far from being unambiguous or easy as a policy starting-point. Without going into a lengthy discussion, it may be referred to some key challenges: First, firms and industries vary in terms of their innovation-related needs to a great extent and, for example, knowledge relevant for a certain industry is not needed much among firms in another industry (Pavitt 1984; Jensen et al. 2007). Second, building innovation capabilities on a firm and system levels is a manifold and complex set of policy measures. Third, many of the knowledge flows are almost beyond reach of policy-making due to, for example, situated and embodied character of much of innovation-related knowledge. A variety of dimensions of proximity/distance between actors in economic space adds up to the complexity. Owing to these difficulties, a traditional ‘hands-on’ approach of an industrial policy may not often function whereas an ‘enabling’ policy approach may suit in a better way, with activities such as ‘vision creation’ and ‘discursive co-ordination’ to more indirectly steer transformation processes of a national or a regional economy (Schienstock 2004, 14–16).

Relevance of regional innovation policy

There are thus both spatial and sector aspects to consider in regional innovation policy. Although often taking place at the national level and increasingly at the international level, too, there are also several reasons to conduct innovation policy on a regional level. First of all, a considerable proportion of total world output of particular goods is produced in a limited number of highly concentrated regions. Second, firms in particular industries, or firms that are technologically or otherwise related, use to locate in the same place and form geographically bounded agglomerations (Porter & Sölvell 1998, 441). Third, both these phenomena tend to persist over time – even in the case of new knowledge-intensive industries, in which firms are usually highly capable of exploiting the full state-of-the-art possibilities of information and communication technologies. Therefore, innovation processes are not spread evenly across space but concentrated in certain regions (Fritsch & Stephan 2005, 1123).

The significance of geographical proximity in innovation processes may be related to 1) agglomeration of production and innovation activities which potentially lead to technological spillovers and advantages of specialization, scale and scope. This proximity also may contribute to 2) the creation and diffusion of tacit knowledge and its nurturing into the local labour and varied types of inter-organizational and inter-personal networks. Related to this, proximity also may 3) increase a probability of casual and unplanned meetings and exchange of knowledge and ideas. As stated earlier, immediate environment also tend to have 4) a considerable impact on thinking and behaviour through cognitive and normative influences in local everyday environment. In addition, even very heterogeneous groups of actors located in a same region may be connected and their resources mobilized by shared cultural, psychological or political perspectives or motives especially in a case of a regional threat or crises caused by internal or external forces (e.g. plant closure and mass unemployment).

For the effectiveness of innovation policy, a regional level (or regionalized policy) may be beneficial. First of all, regions within a certain nation may vary to a great extent by, for example, their resources or their institutional settings. And even though they would share many common elements such as shared regulatory and educational environments, these regions may vary in how the similar policies are being delivered or how firms and other organizations respond to these policies (Howells 1999, 77; Fritsch & Stephan 2005, 1123-1124). Furthermore, a variety of policy approaches in dif-

ferent regions offers a chance to comparison and benchmarking, although it can also be a source of inefficiency (*ibid.*).

As mentioned, it is important to note that firms and industries differ in their innovation activities. There are many taxonomies and perspectives on variety of innovation activities that are partly overlapping and also complementary to each other. Schumpeter's Mark I and II is one of these, splitting industries into two main modes in which Mark I is characterized by, for example, small size of innovating firms within the industry, number of innovating firms is large but also the possibilities of appropriability are limited leading to reduced incentives of innovation and/or incremental innovations (see Klepper 1996; Malerba 2002). Mark II is characterized, in turn, by few, typically large innovators within the industry and there are considerable thresholds to enter the industry. Pavitt's taxonomy (1984) outlines five technological trajectories with their typical core sectors based on their sources of technology, tasks of technology strategies, requirements of users and possibilities of appropriation. Recent increased understanding of service innovations and service industries' role in innovation have brought forward complementary elements to this theorization (see e.g. Soete & Miozzo 1989) or entirely new perspectives (e.g. Sundbo & Gallouj 2000).

Another perspective is provided by Jensen et al. (2005) by dividing innovation and learning activities into two main groups: the DUI model ("DUI: learning by Doing, Using and Interacting") and the STI model ("STI: Science, Technology and Innovation"). This divide is not exclusive for an industry or firm, instead both models may, and often does, occur in a same firm although the less science-based industries (including many service industries) tend to build on the DUI model. The advocates of this STI/DUI model remind that science-based innovations almost always demand also experience-based learning typical for the DUI model. Regarding the knowledge base from which innovators draw in their search for knowledge and information, three distinctive categories can be distinguished: analytical (science), synthetic (technical), or symbolic (creative) (see e.g. Cooke & Leydesdorff 2006).

These theoretical constructions provide a foundation upon which innovation policy design may build on in order to recognize the different innovation needs, processes and outcomes. Nevertheless, there is obviously varying interest towards and use of these models among the policy-makers.

Uneasy marriage of the policy arenas?

According to Howells (2005, 1227) "(r)egional innovation policy is caught uncomfortably between the two [policy arenas]", namely regional policy and innovation policy, where the practitioners of the former nowadays more often have a bottom-up approach compared to the innovation policy practitioners having usually more top-down perspective. Howells (*ibid.*) warns us that without recognizing and appreciating these different policy backgrounds, discussion will remain atomistic and fragmented in nature. For the regional policy, it has traditionally also been typical to aim at reducing disparities in regional development within a country whereas the goal of the innovation (or technology) policy has usually been to accelerate the technological change and to push forward the technology frontier often without consideration of the social impacts of these processes.

Closely related to these, a constant and focal issue in the domain of regional innovation policy in Europe is the question of balance between policies targeted to create new high-technology or knowledge-intensive industries, on the one hand, and policies targeted at developing and modernizing more traditional and mature industries on the other. In addition, there is a growing awareness concerning the role of the service sector and its knowledge intensive part, in particular, in fostering the knowledge flows within and between innovation environments (Den Hertog 2000; Müller &

Zenker 2001). Lundvall, for example, in his influential report for the European Commission (Lundvall & Borrás 1999), calls for a coherent set of policies to promote a vision of a “learning economy”, which would safeguard cohesion between industries and regions in Europe in a manner that would prevent any large gaps from emerging between them – gaps that would be difficult and costly to overcome with any redistributive policies.

Social cohesion refers to, at least, five interlinked dimensions that are common values and a civic culture; social order and social control; social solidarity and reductions in wealth disparities; social networks and social capital; and territorial belonging and identity (Kearns & Forrest 2000, 996–1001). In a context of regional development, it essentially refers to avoiding increasingly uneven development where regions are on a diverging course in terms of, for example, growth of production or un-/employment. Regarding competitiveness, its meaning on a firm level is fairly uncontested in general, but on a national/regional level the notion is complex and far from consensus (see e.g. Krugman 1994, 27; Kitson et al. 2004). Kitson et al. (*ibid.*, 5–7) state that there are three main aspects of revealed regional competitiveness, or competitive advantage that are regional productivity, employment and standard of living. These are underpinned and affected by six forms of capital, namely productive, human, social-institutional, cultural, infrastructural and knowledge/creative capital. This suggests that there seems to be a link between cohesion and competitiveness in a form of, at least, social capital meaning that a degradation of a region’s social capital eventually lead to a weakening regional competitiveness especially if we accept the assumption that it is partly based on interpersonal and –organizational learning.

If regional innovation policy, when practised by a national government, ignores the distributional consequences arising from an unequal spread of competitive assets, it may generate substantial human costs and widen social inequalities, and market forces may further exacerbate these disparities by skewing resources towards regions with more promising commercial prospects and confidence among investors (c.f. Turok 2004, 20). If corrective mechanisms are weak, this decline may be self-reinforcing as privileged regions may attract away investment, talent and entrepreneurial skills. Thus, ‘equal’ competition between regions does not necessarily reduce disparities but may increase them as some regions may be disadvantaged from the start.

Competition, nevertheless, has its virtues and positive consequences, too. Competition between regions leads them to search for special areas of technological and other expertise, and prevent complacency among local authorities (*ibid.* 20). It may foster innovation and learning (or imitation) and may contribute in building on regions’ distinctive and identifiable features to attract new inhabitants, visitors and investors, thus enriching the quality of life. The weightiest argument usually presented to support undisturbed, ‘natural’ development processes including competition are that they may increase the size of ‘a cake’ for political redistribution. These arguments are to some extent backed up by studies that have indicated that sectoral concentration leads to enhanced growth (e.g. Guerrieri 1999), but these studies have mostly compared national economies and “(national) sectoral concentration and growth does not necessarily equate with (sub-national) geographical concentration and growth” (Howells 2005, 1224). Increased integration of the regional economies to international trade certainly have an impact on the traditional configuration where competition (whether intended or not) between regions was a zero-sum game – as it was more a game between the regions within a country.

The question of balance between competitiveness and cohesion in regional innovation policy is further complicated by analyzing it on different spatial levels. It may also be analyzed from the top-down or bottom-up perspective, or from a perspective of multi-level governance as is the case here. One of the key issues to facilitate this sensitive balance between competitiveness and cohesion

seems to be related to the competences of local/regional policy-makers (Sotarauta & Mustikkamäki 2008): whether such competences are strongly concentrated to few leading regions or distributed more evenly between regions may have a considerable impact on a quality of bottom-up policy and contribute to capability of exploiting resources available on national and trans-national levels.

Put simply, regional innovation policy may contain in itself a controversy or a tension to balance the two often conflicting goals of enhancing competitiveness and maintaining industrial, regional or wider social cohesion. Nevertheless, as discussed, these two goals may be reconciled (c.f. Sharp 1998), although to achieve the needed balance may demand very cautious and sensitive policy. In Finland, Lemola (2006, 14) notes that the salient goals of the regional innovation policy have been to reinforce the competitiveness of the regions as well as to develop balanced regional structure. This tension/balance is an underlying theme that is being tracked down through this paper when analysing the development of the regional innovation policy in Finland.

3. Formation of the regional innovation policy in Finland

This chapter broadly outlines the emergence and development of the policies related to the regional innovation policy, and that have led to an emergence of it. Essentially this implies that much has had to be left aside and many processes are depicted in a simplified manner.

Finland has for a long time been one of the model countries in innovation policy. For example, The Lisbon Review (2006) stated that the country is the second in meeting the goals of the Lisbon Strategy, and according to the European Innovation Scoreboard (2007) Sweden, Switzerland and Finland are the three top countries with the EU in innovation. However, there are significant challenges for the Finnish innovation policy.

Innovation activities, at least the formal R&D activities, are strongly accumulated to a small number of firms (see e.g. Kautonen 2006). Although strong in developing technology (especially ICT), Finland is showed to have problems in commercializing this and exploiting the benefits of the developed technology (Koski 2005). In addition, there are large segments of society left almost untouched by innovation policy although in need of renewal (e.g. many public services). These examples are enough to indicate that there is still long way to go in developing innovation capability on a wide social scale, and to exploit the full potential of the national innovation system.

In Finland, the birth of the regional innovation policy has been a result of partial confluence of three broad policy sectors. These three sectors are the following:

- national innovation policy; here considered to consist of the national higher education, science, technology and innovation policies
- national-regional development policy (programme-based regional policy); the emergence of the innovation-driven regional development policy based on a dialogue between the national and regional level, evolved from the more traditional regional policy
- local economic development policies, that has increasingly transformed from providing physical and financial assets to developing human resources and creating incentives and favourable milieu for innovation.

These three policy sectors are briefly dealt with in the following, each in their own section. The focus is on the main outlines of the policies, other institutions and key organizations.

Roots and birth of the national innovation policy

The Finnish national innovation policy has emerged as a result of partly overlapped science, technology and innovation policies. On the long term, the main development trends of these three policy areas can be outlined in three main phases (Lemola 2002; Georghiou ym. 2003; Sotarauta & Kautonen 2007, p. 1089-1094):

- Building the basic structures and institutions (from the Second World War to the 1970s); during the period, the current university system evolved, the ministerial committee on science was established in 1963 (the Science Policy Council, from 1987 the Science and Technology Policy Council chaired by the Prime Minister), and the main financier of basic research, the Academy of Finland, was established in 1948 (renewed in 1970). The period until the 1970s was characterized by a strong role of the state, but in a geographical expansion of the university network many cities were in active roles (Nieminen 2005).
- Orientation to technology development and transfer (1980s); the period is marked by a shift from science policy to broader science, technology and innovation policies (Nieminen & Kaukonen 2001, 31). As in many other countries, policy-makers were inspired by Japanese industrial and technology policies that seemed able to identify growth sectors, pick winners and provide considerable resources to promising new technology areas. Accordingly, Finnish policies began to aim at integrating science, technology and industry (Lemola 2002, 1484) to exploit new technologies for the benefit of economic growth and employment. The National Technology Agency (Tekes) was established in 1983 to foster institutional capacity in fulfilling these aims. Tekes launched immediately its first national technology programmes to intensify cooperation between firms, universities and research institutes, and indeed these programmes have been an effective instrument in fostering knowledge flows (Georghiou et al., 2003; Lemola, 2002, p. 1484). At the local level, the first science parks were established during this period (the first in Oulu in 1982). Technology and innovation policies began to emerge partly in interaction with the national activities, partly as independent local initiatives. These local activities nurtured competencies and formed a basis that enabled a rapid expansion of innovation policy activities during the next decade (Sotarauta & Kautonen, 2007, p. 1092).
- Building the knowledge-based society and national innovation system (from the 1990s onwards); the developments of the period were accelerated by the severe recession Finland faced in the beginning of the 1990s. With the real GDP dropped by over 10 per cent in three years and the unemployment rate bounced from 4 per cent in 1990 to about 20 in 1994 (Honkapohja and Koskela, 1999), there was a wide acceptance within the country to new policy ideas and concepts. Because of close relationships between the Science and Technology Policy Council and the OECD, the concept of the National Innovation System was adopted first in the world as a basis for the national innovation policy. Horizontal, conditions-enabling innovation policy, as an opposite to the 1980s' targeted technology policy, directed considerable new investments to R&D activities, to both industry as R&D grants and loans and as R&D project funding to the universities but based on a competitive bidding. The new innovation policy also multiplied the supply of university graduates in particular in ICT-related disciplines. Simultaneous access to the EU in the beginning of 1995 offered further significant increases in these investments through the EU Structural Funds. A Triple Helix –type of setting (industry, government and universities) began to strengthen. This was fostered by the launch of a new Centre of Expertise Programme in 1994 which to a great extent regionalized innovation policy and brought innovation perspective remarkably into the regional policy as well as to local economic development policies.

Main developments in the regional policy

As a Nordic welfare state, Finland has had considerable redistributive policies (taxation, income transfers, public services and so forth) that have enabled balancing the regional development within the country, effective especially from the 1970s onwards (Vartiainen 1998). More specific regional policy began to acknowledge also the more qualitative dimension of business activities, during the period of industrializing regional development policy from the beginning of the 1970s onwards, by contributing to the supply of skilled workforce and firms' immediate environment in a form of, for example, industrial parks. During the period of regional policy planning (ibid.; until the end of the 1980s), policy focus shifted to firm-level and at the same time, in the discussion on the regional policy an opportunity for targeting measures to selected nodes of growth to increase the policy impact was raised but no consensus neither formal agreement was reached on this (ibid.).

Regional innovation policy emerged at the time when the programme-based regional policy was created in 1991-1994. New regional policy concept was initiated and designed simultaneously with the deepening recession. There was already an insight of a need to renew the regional policy according to the outlines of the EU Structural Policies, and at the same time to encourage bottom-up strategies and local initiatives by national regional policy incentives. Therefore the programme-based regional policy stressed an inclusive approach where different regional stakeholders would be participating into the programme design and implementation. After ratification of the new legislation on the regional development in 1993, the Centre of Expertise Programme (shortly hereafter CoE) was launched by the Finnish Ministry of the Interior Affairs. This can be conceived as a birth of regional innovation policies in Finland. The Programme brought together a national overall initiative and coordination and (sub-) regional and local strategies to foster innovation activities and capabilities.

The centrepiece of the Finnish regional innovation policy

The Centre of Expertise Programme is an objective programme under the terms of the Regional Development Act (1135/93), one of its aims being the directing of local, regional and national resources towards the development of selected internationally competitive areas of expertise. The Programme was first implemented in Finland in the period 1994-1998 at eleven Centres of Expertise (CoE). The encouraging experiences gained from activities led the Council of State to extend the Programme by designating new areas of expertise and new Centres of Expertise to carry out a second national programme. The second period for the Programme was 1999-2006 with 14 regional Centres of Expertise and two national network Centres of Expertise. The current period began in 2007 to last until the end of the year 2013.

The basic idea of the Centre of Expertise Programme is the utilisation of knowledge and expertise, existing in the different regions, representing "the highest international standard" as a resource for firm and job creation and regional development. Crucial co-operation parties in each centre are firms, universities, other HEIs, research institutes, science parks and various sources of finance. What is of special interest here is that the programme represents the first formal national regional policy measure that focuses on developing the strengths of the regions instead of trying to balance the regional disparities in an established tradition of the Finnish regional policy. It is to be noted that the Programme as such do not possess a big budget but one of the ideas is that it provides designated centres with a small 'seed funding' with which to operate – to compete for national R&D funding, for example, and to initiate and coordinate activities in a respective field of expertise: "The Government has challenged regional actors to cooperate in joint strategies by using relatively small funding incentives and at the same time giving them a high-level status in the Finnish innovation strategy" (Centre of Expertise Programme, 2008).

The operations model of the programme was reformed for the new term as a cluster-based model, in order to increase regional specialisation and to strengthen cooperation between centres of expertise (in different regions) which was earlier assessed as a weakness. At present, the Programme is carried out by 13 Competence Clusters and 21 Centres of Expertise belonging to these Clusters. The Government appointed the competence clusters after two-phased competitive tendering. For the period of 2007-2013, the Competence Clusters operate on the following fields of expertise (names as they formally appear in English): Cleantech; Digibusiness; Energy Technology; Food Development; Forest Industry Future; HealthBIO; Health and Well-being; Intelligent Machines; Living Business; Maritime; Nanotechnology; Tourism and Experience Management; and Ubiquitous Computing.

Main outlines in development of local economic development policy

On the regional and especially local level, municipal-driven local economic development policy had flourished already from the 1970s and 1980s. At first this had concentrated on providing physical facilities by building and renting production space from which the local economic policies expanded to contribute to skills development of the local labour and to provision of information and communication technologies and related capabilities. In the end of the 1980s there was also first signs of supporting the formation of networks, and especially horizontal partnerships between local SMEs.

Large cities with universities had already in the 1980s began to create and foster institutions for technology transfer and commercialization. In the 1990s, the Finnish education system responded to the expansion of knowledge-intensive industries by a reform of vocational education (Raivola et al., 2001) establishing the non-university sector in tertiary education. By merging post-secondary level and higher vocational level educational institutions into 29 multidisciplinary polytechnic institutions (Marttila et al., 2008, 417) and on the basis of the new law on these polytechnics in 1993 with a statute of their regional engagement, Finnish regions had a considerable resource for knowledge-based regional economic development also in cases where there was no university located in a region.

4. Main outlines of the regional innovation policy from the 1990s

This Chapter concentrates on the developments occurred after the actual formation of the regional innovation policy in the mid-1990s. Both the key institutional changes and the main drivers of these changes are discussed. The Chapter aims at capturing only the most essential processes and towards the end interpret their meaning for the balance of competitiveness and cohesion in the regional economic development.

Main developments in the 1990s

From the viewpoint of regional measures and structures of the innovation policy, the main outlines of the regional innovation policy can be characterized as follows. During the first phase in the end of the 1980s before the emergence of the actual regional innovation policy, the focus was on the one hand in local technology development and transfer and on the other hand on fostering local network formation among SMEs. From the beginning of 1990s, the emphasis shifted, along with the recession, to local and regional capability building and enhancing human capital formation. These meant the extensive development of existing qualifications of the workforce and a strong increase in the

supply of incoming qualified workforce, as well as the extensive development of the institutions and competences of innovation policy-making.

Although the overall policy thinking of the central government had already earlier abandoned “picking the winners” policy, there is no doubt that especially the information and communication technology-related industries were in focus of the innovation policies. Also among the cities, ICT industries became very appealing due to their need to find new sources of employment. In the end of the 1990s, Nokia Group in particular established many new R&D units also in new locations in order to secure the supply of university graduates during the years of the group’s rapid growth. This led large cities and their respective universities to foster their co-operation in order to attract large ICT firms to locate to their regions.

Programme-based policies and widely inclusive strategy-making processes had to be learnt and in this sense the Finnish regions proceeded with various pace and outcomes. The leading cities in developing local/regional innovation policy at the time were Oulu, Tampere and Jyväskylä. Each of these three cities, for example, had remarkably distinctive own strategy and modes of operation, although there also was mutual learning on their policy experiences which was also affected by the Centre of Expertise Programme as well as by the Finnish Science Park Association. At that time, the role of local well-functioning coalitions and of leading individuals was emphasized (c.f. Kostiainen and Sotarauta, 2003).

It was quite typical for the developments of the 1990s that the regional innovation policies were to certain extent introverted: regions focused on strengthening their internal networks, social capital and competences. The adoption of the Porterian cluster model and its regional variant led many policy-makers to consider their agglomerations of production and knowledge within tight regional borders that were in most of the cases too narrow to consist of a sufficient number of actors and available resources (c.f. Lagendijk et al. 2000). As such this introverted start is understandable because the whole emergence of the Finnish regional innovation policy can be conceived as an evolutionary learning process in which it is impossible to move directly from A to C without going through B. Therefore, the adoption of (regional) innovation system approach and the cluster model as a basis of the regional innovation policy-thinking led the policy-makers to study the deficiencies in resources and institutions internal to a region. Only after the mid-2000s there have appeared remarkable policy activities crossing the regional borderlines in searching for complementary competences (Sisäasiainministeriö, 2006).

In the 1990s, one of the crucial changes evidently is the transformation that took place in the regional bodies of the central government related to economic development. The new regional Employment and Enterprise Development Centres (EEDCs) were established in 1997 by combining together three ministries’ regional organizations (Ministries of Labour; Trade and Industry; and Agriculture and Forestry) as well as including into these a provision of services by several other public organizations (e.g. Tekes, FinPro). This devolution process and a combination of public business services meant that all the Finnish regions now had a governmental agency providing, for example, R&D grants and loans, services supporting business and human resources development and allocated the ESF and ERDF funding in close geographical proximity of regions’ firms.

The Finnish Funding Agency for Technology and Innovation, Tekes, eased off its views on regionalization of the innovation policy – probably partly because in the organization it was noticed that the wide regional mobilization had entailed considerable activation and increased demand for funding and technology programmes of Tekes. Another reason for this change in views is that the programme and projects were now based on competitive bidding and wide-scale co-operation in con-

trast with the traditional regional policy that was more affected by party politics and lobbyism. Competition-based funding has steered actors to a process of continuous development and innovation (Lemola, 2004).

Main developments in the beginning of the 2000s

The turn of the Millennium was characterized by the ICT boom. In Finland, this could be seen, among other things, in the immense appearance of the foreign capital inflow. For some time even very small, newborn business ventures of the ICT sector were pushed with tremendous venture capital offerings, and there were a vast number of new entrants to software, Internet, mobile gaming and other ICT-related industries. Nevertheless, the biggest ICT bubble burst in the USA before many excesses occurred in Finland. We may propose that the period may have been fruitful in sowing seeds of “opportunity-based thinking on knowledge-intensive entrepreneurship” in the country that has traditionally been almost unappreciative towards entrepreneurship among people with higher education (c.f. Autio, Kronlund, & Kovalainen 2007). The period also left behind many local e-programmes that afterwards corrected their course of action according to the new realities.

The importance of internationalization was widely recognized by the policy-makers in the turn of the Millennium, although this process has begun to gain ground already earlier due to the EU accession in 1995. Because of its relatively remote location in Europe and of its history first as a part of Swedish kingdom and then until 1917 of the Russian Empire, Finland has traditionally been much less internationalized than, for example, its neighbour Sweden. Internationalization has been a slow and gradual learning process that has not even yet progressed far, but the learning process nevertheless has been fairly rapid during the recent short period. Co-operation between regions has seemed to produce the best result so far in supporting internationalization of the regional firms and other actors in which a good example is the programme supporting the software firms entering the US market (Sisäasiainministeriö, 2006).

In addition to the outward oriented internationalization, also the importance of the inward foreign direct investments was recognized in the regional innovation policy. After the ICT boom, it seemed for a while that the foreign investors had completely lost their interests for Finland, but it was soon realized that this was not the whole picture as the domains of interests were different to those that were expected (i.e. high technology industries) and which were during that time not the ones in the primary interests of the regional innovation policies. In retail trade, real estates, business services and a variety of other services the growth of inward foreign direct investments was and has been until now considerable (Hyypiä & Kautonen 2006).

Towards the end of the period, from 2000 onwards, new private agencies emerged among the actors of the regional innovation policy. First, a multitude of regional venture capital funds and their management companies were to a great extent consolidated into few larger, mostly privately owned management corporations that enabled their more professional mode of operation and increased resources. At the same time, however, their decision-making was often transferred to take place outside the regions. Second, science park-related businesses mostly became privatized; especially their real estate functions were merged to a one strong company (Technopolis Ltd.) and also to some extent functions related to the incubation and new business development. Instead, the regions (cities and other public bodies) have mostly maintained their ownership in regional intermediary companies responsible for functions related to, for example, cluster and network development and wider regional economic development, partly because these are usually the ones coordinating the regional Centres of Expertise and other, locally initiated programmes. Third, the private consulting

businesses sprang up in this field and the perceived success of the ‘Finnish model of knowledge economy’ has contributed also to the internationalization of these businesses.

New policy perspectives

In the end of the first decade of the 2000s, three new major themes have emerged to the Finnish regional innovation policy agenda. These three are 1) services and service innovation, especially the so-called knowledge intensive business services; 2) creativity, creative professionals and cultural industries; and 3) growth firms and growth entrepreneurship. Reasons behind the emergence of these three themes are, among other things, an active search by policy-makers of new trends; close links between the Finnish policy-makers and researchers; and concerning the last theme (3) in particular, a perceived need for employment growth in the face of “China phenomenon”, an increased off-shoring of, especially but not exclusively, manufacturing employment.

The new themes pose a considerable challenge for the Finnish policy-makers as they cannot be dealt with the traditional manufacturing-/technology-orientation. On the local and regional level, several cities have already tested new approaches and gained experience on developing service and cultural industries or boosting growth-oriented firms, for example. On the national level, the government is about to publish a new national innovation strategy in autumn 2008. According to the preliminary proposal (National Innovation Strategy, 2008), the strategy will be based on the idea of double-edged innovation strategy in which both the science and technology-based innovation model (STI) and the Doing, Using and Interacting-based innovation model (DUI) are similarly important (on STI/DUI, see Chapter 2). The strategy thus emphasizes also the user and demand perspective, as well as services and traditional industries instead of only concentrating on high technology industries and R&D. It is considered that Finland is already fairly strong in the latter areas whereas it could gain more by widening the perspective and deploying a larger number of actors and sectors in innovation activities either as producers, diffusers or users of innovation (Kuusisto & Meyer 2003; Toivonen 2007).

An intensified search for growth firms and growth entrepreneurship is based on the earlier experiences that have showed that the intensity of innovation activities in terms of technological R&D has not led to a rapid growth of new business venturing and employment, contrary to the earlier held national beliefs. After the burst of the ICT bubble the Finnish policy-makers became at the latest aware that more was needed to support growth. A heightened national R&D intensity – both private and public – had certainly benefited large and established R&D players and had also created a large cohort of new innovative firms but out of these small firms very few demonstrated a growth track via which a national production structure would have been considerably renewed. Instead, the majority of small innovative firms remained as “national undergrowth” or they were sold to foreign owners which often exploited their commercial potential somewhere else (Puttonen 2004; Huovari and Volk 2008). Now there has been a strong political will to support the growth of knowledge intensive firms and the “growth-oriented policy” has attained a very focal position in the innovation policy. The impact of this policy change, nevertheless, remains to be seen somewhere in the future.

From fragments to strong concentration

There were indications in the end of the 1990s that the course of the regional development in Finland was towards divergence; that the largest city-regions would flourish and the smaller city-regions and more remote regions would decay. Until now, this seems not to be the case, however: also many of the smaller city-regions have been able to grab new opportunities opened up by the (regional) innovation policy (Sisäasiainministeriö 2006). Nevertheless, many of these small regions

are heavily dependent on public sector actors and resources. It can be claimed that, compared to the situation in the 1990s, different kind of regions have at present more competences to create environment that support the emergence of innovations and new businesses – for example, there are the so-called gazelles, fast-growth firms, existing in each region in Finland (KTM 2006). In the 1990s, there were hundreds of small innovation projects going on in Finland in every region which laid the foundation for grassroots learning, awareness and local mobilization of innovation. On the other hand, it was to a great extent a very fragmented and even chaotic, ungovernable mosaic of projects that was considered expensive and inefficient exercise by many of the national innovation policy-makers. According to Lemola (2006, 43–44, translated by the author) *“the topmost observation of the current regional innovation policies is their fragmented small scale and a large number of overlapping programmes and actors. There are confusions in the division of labour both horizontally in the regions (city-regions, regions) as well as vertically between the national and the regional level. There is also abundance of outdated bureaucratic planning and organization-centrality. These characteristics do not contribute to the formation of innovative environments neither provide incentives to develop such.”*

As a backlash to that, the 2000s have been an era of a strong concentration tendency, especially from the 2005 onwards, and the shift has been towards more nationally steered innovation policy. The regional dimension has remarkably been put aside to a secondary level priority, although paradoxically the current government is led by the Centre Party of Finland that traditionally has been the strongest supporter of regional policy in Finland. There are doubts that the change has been too radical and too much to the other extreme – from fragments to strong concentration with one, great leap (Kautonen 2008).

Characteristic for the Finnish (regional) innovation policy is its strong belief in rational planning (Sotarauta & Kosonen 2004) – an effort to “engineer” an innovation-based growth machine by designing structures and institutions that would enable an overall control and full support for innovations to emerge and lead to economic success. Previous successes (e.g. high position in international comparisons) have further encouraged this belief, as well as the introduction of the European Union’s rigid funding system in the Structural Funds in particular.

At present, there is emerging two partly separate areas of (regional) innovation policy in Finland; the one that more or less strive to foster the national competitiveness by creating and strengthening internationally competitive “spikes” of innovation and the other that is more oriented to build innovation capability in the regions. Accordingly, these two main areas of the (regional) innovation policy in Finland can be named as “Spikes of innovation” and “Learning regions”.

- *“Spikes of innovation”*: Especially science- and technology-based innovation policy (STI mode) that strive to respond to the challenges set up by the globalization of the economy by fostering narrow niches of top expertise. These policies aim at prominent concentration of the innovation activities within the country. The main weapons in this are the Strategic Centres for Science, Technology and Innovation (SCSTI) and the new university named Aalto University, which will be created through a merger of the Helsinki School of Economics, the University of Art and Design Helsinki, and the Helsinki University of Technology. In addition, the new programme period of the Centre of Expertise Programme (2007–2013) has shifted significantly to this direction by a creation of nation-wide competence clusters combining respective centres of expertise in different regions.
- *“Learning regions”*: Innovation policies that are, compared to the above model, more based on continuous learning and incremental innovation (DUI mode), and which aim at enhancing capability to innovate in different sectors and regions, including also the services as well

as more mature industries and peripheral regions. These policies are to a great extent based on the bottom-up approach and contributed also by the universities and other educational institutions of which there is (still) a dense web in Finland. Concerning national level activities in this context, the new Regional Cohesion and Competitiveness Programme (RCC in short) is under preparation, which aims at reducing complexity of regional development programmes by combining several programmes into a one large programme. RCC will be strongly based on idea of innovation-driven regional development although, as stated here, more based on the DUI mode. On the other hand, there may emerge problems in carrying out the new Programme because at the moment it seems to become too all-embracing and scattered.

At the moment, it seems that the former policy area will become much stronger by its financial basis, and it has also gained much more media's and policy-makers' interest on the national level, whereas "Learning regions" has been left on its own and without any significant new resources by the national level. At the same time, the funding from the Structural Funds of the EU is about to be mitigated. On the other hand, all regions have gone through a learning phase from the mid-1990s up until now during which the regional/local policy-makers have gained experience on designing and carrying out innovation policy. Therefore, there should be enhanced capabilities to exploit the available regional, national and international resources to provide incentives and support for innovation activities in their respective regions.

As testimony of their enhanced policy-making capabilities, particularly most of the large cities have since 1990s initiated and carried out their own local innovation programmes. The most renowned of these are eTampere Programme (1999-2005; a project budget of 130 Million Euros) in Tampere, Southern Finland (see Castells & Himanen 2001, 128-131), and Oulu 2006 Growth Agreement (2002-6; a project budget of 300 Million Euros) in the Northern Finland (Lemola 2006, 34). Recently, the capital city Helsinki has come up with its ambitious Forum Virium Helsinki Programme. All these three are focused on ICT cluster, but the biotechnology boom brought up also regional/local programmes focusing on it and on health care technologies. The latest interest in innovation programmes have been, not surprisingly, on creative and cultural industries.

New strategic centres gathering dispersed R&D resources

In June 2006, the Science and Technology Policy Council of Finland decided to establish Strategic Centres for Science, Technology and Innovation (SCSTI) in fields that were considered the most crucial among the stakeholders to the future of Finnish society and industry. The aim of the strategic centres is to create a new, more efficient framework for collaboration between firms, universities, research organisations and sources of funding, and to gather dispersed R&D resources in the respective fields. These centres will be formed around new companies to be established, owned by key private firms and public organizations. The National Funding Agency for Technology and Innovation (Tekes) bears the main responsibility for organizing the establishment of the centres. Together with the Academy of Finland, Tekes has initiated the discussion with various stakeholders. The actual establishment of the strategic centres will be the responsibility of the partners, that is, firms, universities and research institutes. In addition to shareholders, public funding organisations will commit themselves to providing funding for the centres in the long term.

Briefly put, firms, universities and research institutes will agree on a joint research plan. The plan will aim to meet the needs for practical application by firms within a five to ten year period. At present, there are five strategic centres just established or under planning in the following fields: energy and the environment; metal products and mechanical engineering; the forest cluster; health and well-being; and information and communication-technology based industries and services.

Actually the establishment of the new Strategic Centres for Science, Technology and Innovation is not a part of regional innovation policy but more under the domain of national innovation policy and yet it certainly will have a strong effect on regional development due to its obvious tendency to concentrate R&D to few most prominent locations. The interesting issue related to the SCSTI is its apparent overlap with the also new Competence Clusters of the CoE Programme: In both, there are ICT, forest and health related key areas, for example. It is not yet clear how these two institutions are supposed to interact. It can be stated, on the one hand, that the Finnish government has taken seriously the challenge set by the economic globalization as it recently has introduced several new policy measures and reorganized existing institutional setting. On the other hand, it can be asked whether this institutional setting is getting more well-defined and streamlined as hoped and whether the most recently conducted top-down policy is fully accepted and well adopted on the regional and local level.

The establishment of the brand new Aalto University, for its part, have not followed the widely adopted policy-making and funding practice based on dialogue and competitive bidding, but instead it was simply and straightforwardly decided within a group of key stakeholders that the university will get an outstanding sum of additional funding from the government for its equity as well as for its working capital. The university will consist of three universities all located in the capital city region. The heated debate that has been going on in the Finnish media shows, among other things, that big public investments for the capital city region are considered by their strongest advocates as inputs in favour of national competitiveness whereas those investments, if made elsewhere, are measures of regional policy even if they are based on competitive bidding.

5. Discussion and conclusions

The paper has outlined the emergence and development of the Finnish regional innovation policy. Specifically the paper has focused on an often uneasy trade-off between goals of national/regional competitiveness and social cohesion – concepts that by themselves are rather fuzzy and complex and difficult to scrutinize. This Chapter summarizes the main milestones and trends, and interprets and discusses the main findings from this perspective.

Towards an innovation growth machine?

We may conclude by outlining three main phases in the overall development of the Finnish regional innovation policy. Obviously such a simplifying analysis leave out many significant processes and draws too clear boundaries between the phases but nevertheless it also facilitates in understanding some of the main movements and interdependencies. These three phases can be titled as 1) “Embryonic”, 2) “Drawing the regions into the game”, and 3) “Streamlining for an innovation growth machine”.

Embryonic phase: First, before 1994, we may term the period as “embryonic” during which there were mostly separate policy domains with little mutual interaction. Examples of interaction include local economic development policy with its connections with nationally designed regional policy. National technology policy and initiatives in the largest cities to build and develop science parks and institutions for technology transfer had a dialogue from the end of 1980s. The term “innovation policy”, let alone regional one, was not used before the beginning of the 1990s when it entered into the policy vocabulary together with the term “national innovation system”. In the regional economic development, regional convergence and upgrading the technological level in the regions were im-

portant goals of the first phase. Also the importance of networking among the SMEs was recognized and some regional and national initiatives were set up to foster this process albeit the networking was in the beginning mostly conceived in terms of horizontal partnerships and economies of scale and scope but not in terms of enhancing vertical co-operation or innovation and learning.

“Drawing the regions into the game”: The next phase can be considered to begin from 1994 in line with the introduction of the Centre of Expertise Programme that, as stated, has since that formed the backbone of the regional innovation policy. The phase lasted until 2006 when the third programme period started with somewhat altered operation mode that puts more emphasis on the nationally orchestrated competence clusters and seems to leave less room for regional independent activities although undoubtedly reduce redundancy of the policy measures taken by different regions and add up joint resources needed, for example, for international operations. During the phase from 1994 until 2006, international linkages were mainly created and maintained by already internationally strong players such as large companies and universities, although towards the end of the period more and more actors were drawn to international co-operation and business.

The phase is characterized by, among other things, regionally bounded cluster development initiatives and efforts to build institutions fostering innovation activities in the regions. It is fair to say that the period was marked by diffused and cohesive innovation policy activities where little attention was paid to inter-regional co-operation. Although often ineffective, the period considerably contributed to a widely distributed learning process on innovation and innovation policy in all regions of Finland, and therefore enabled a powerful breakthrough of the idea of innovation-driven regional development.

“Streamlining for an innovation growth machine”: If the previous period was characterized by scattered and more bottom-up policy activities, the current period from 2007 onwards seem to consist of two policy areas or two levels of regional innovation policy. The more nationally clustered and concentrated policy area, *“Spikes of innovation”* as termed here, primarily seek for enhancing national competitiveness although this policy inevitably has far-reaching spatial consequences that remain to be seen in the future. *“Spikes of innovation”* aim at achieving national critical mass to counter for international competition on jobs, investments and talent. It also aims at achieving more growth based especially on high technology and knowledge intensive businesses as there was fairly widely held dissatisfaction among the policy-makers for the economic output of the earlier public investments especially in terms of new ‘gazelle firms’ and growth industries. As part of this quest for national competitiveness it is believed by the protagonists of *“Spikes of innovation”* that international competition demands an increased size of many of the actors and operations, and thus there is currently a wave of reorganization and mergers going on including the Strategic Centres for Science, Technology and Innovation and the newly-formed Aalto University, known during its phase of preparation as *“Innovation University”*.

Of the two current policy areas, the other, termed here as *“Learning regions”* has been left out of limelight and without, as it seem at the present, any considerable new resources by the central government although the regional bodies, large cities in particular, themselves are fairly active in their activities. It remains to be seen whether the capabilities and institutional basis, created mostly during the previous periods of regional innovation policy, forms a foundation strong enough on which to build.

As such, a formation of the two policy areas as presented above may be advantageous both for the national economy and the regional economies, and for the balanced regional development. Nevertheless, there seems to be some prerequisites for this to happen. First, both policy areas definitely

need adequate resources. Second, there should be several cities with strong “spikes” keeping in mind that Finland is, by its land area, a large country and its capital Helsinki is located in the southernmost coast with a distance to, for example, the major Northern city of Oulu as much as 600 kilometres. Third, the new emerging organizations are not to overlap or to compete with each other (competence clusters and strategic centres) or with other, existing organizations on an unequal basis (universities). Fourth, interfaces and interaction between the actors are to be encouraged by positive incentives instead of top-down administrative fiat. As made clear, it is beyond the scope of this paper to judge the impact of the most recent policy measures. Instead, both potential pros and cons have been discussed.

Competitiveness and cohesion controversy

The evidence of the Finnish regional innovation policy evolution shows, first, how different policy areas partly merged and, second, how this merger facilitated in a diffusion of the idea of innovation-driven regional development as well as in the multi-level governance and learning of the innovation policy. It also shows how difficult it is to attain and maintain a balance between goals of competitiveness and cohesion. To maintain this sensitive balance is not being made easier by the fact that those concepts are far from being unambiguous: Is national competitiveness for the benefit of all the regions, or is the competitiveness of one region for the benefit of all the other regions? Does regional cohesion by definition mean bargaining of the goals of the national competitiveness? Does it lead to a reduction in the size of the national ‘cake’? Is it more beneficial for a small economy to try to strengthen one main economic agglomeration or could there be a network of specialized regional economies and if so, how many? In a globalizing knowledge economy, is a certain ‘critical mass’ needed and how to measure this?

Many of the questions above are classical ones in theorization of regional economic development, dating back for decades if not a century. And yet they are so complicated, pervasive and profound that they remain both difficult and important to answer. Fluid characteristics of knowledge and innovation add to this complexity. To a great extent the answers belong to the sphere of political decision-making as there is no any generic solution outside the context at hand, but definitely there also lies a challenge for research: Conceptual tools and better understanding of content and of complex relations and interdependencies between competitiveness and cohesion is needed, in order to enable more well-informed decision-making in the field of (regional) innovation policy. Essentially this calls for a multidisciplinary approach because, at least at the moment, both competitiveness and cohesion seem to have their “own” disciplines; one concept always more appealing for certain disciplines than the other. As for all policies related to the knowledge economy, the challenge lies in the abstract nature of the many dynamic processes crucial for learning and innovation.

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