



**EXPERT EVALUATION NETWORK
DELIVERING POLICY ANALYSIS ON THE
PERFORMANCE OF COHESION POLICY 2007–2013**

TASK 1: POLICY PAPER ON INNOVATION

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1 EXECUTIVE SUMMARY

Regional dimension to innovation policy: There is a wide consensus in Finland about the importance and basic objectives of innovation policy. Public support to innovation has high priority in the national strategy aiming at diversifying the country's economic basis, improving international competitiveness of the enterprises and increasing productivity. The national innovation policy has strong regional dimensions. Many universities, research centres and enterprises playing a central role in innovation are located in disadvantaged regions. The Centre of Expertise Programme (OSKE) also fulfils the regional dimension of national innovation policy. Instruments related to innovation have become an essential part of the regional policy in the last ten years. In Finland regional policy is based on the Government's regional policy strategy and carried out through both national policy programmes and EU cohesion policy programmes.

ERDF programme contributions: In Finland's cohesion programme strategy 2007–2013 one of the four priorities of the programme is *promoting innovation activities and networking, and strengthening human capital structures*. Nearly two thirds of the total ERDF resources are allocated for innovation purposes. Innovation is a strong priority in all the regional programmes. However, ERDF contribution to regional R&D differ greatly among programmes: The share is highest, 14,4% of all R&D, in Eastern Finland and lowest, 0,3%, in Southern Finland. Consequently, ERDF significantly adds to resources for R&D in the least favourable regions in Finland. The main instruments are direct R&D support to SMEs and support for clustering and networking among firms, research organisations and the local and regional public sector.

Performance of innovation support: There is a lot of evidence concerning the effects of innovation support: Public support for R&D to firms increases their own inputs for innovation and has a positive effect on the productivity of firms. There is also a clear relation between regional/national R&D inputs and GDP per capita. This kind of evidence strongly supports public inputs of R&D and other innovation activities and the use of innovation activities as an instrument for regional policy. According to evaluation results from the earlier period the programmes were successful in improving the competitiveness and networking of SMEs, including those in rural areas. The significant regional differences with respect to R&D expenditure and in innovation creation have evened out to some degree during the last ten years in particular, the position of medium sized university regions has increased. However, the relative position of many small manufacturing towns and remote rural areas has not only improved in terms of innovation and productivity of firms but also in terms of employment and population developments in the last ten years.

Main challenges: Large and diversified urban areas provide the best environment for innovations. In a country like Finland this is a challenge to regional innovation policy based on clustering and

networking in a country like Finland, as the disadvantaged areas are mainly rural and the manufacturing oriented regions have a low population densities and communities are distant from each other. The evidence also shows that the relation between public R&D support and firm productivity is rather complicated, and increased public R&D inputs do not automatically lead to expected effects in disadvantaged regions. In fact, the productivity gap between disadvantaged and advantaged regions has widened during the 2000s. The issue, whether in the future the support to firms should be targeted purely on the basis of the characteristics of the firm and not on the basis of the characteristics of the region, should be considered.

2 NATIONAL AND REGIONAL INNOVATION POLICY AND THE CONTRIBUTION OF ERDF

2.1 NATIONAL AND REGIONAL INNOVATION POLICY

Background

Finland is a country with a rather narrow industrial economic basis, significant regional differences and long distances to large market areas. There is a long tradition of policies aiming at diversifying national economic structure and specialization in goods and services which can compete in world markets in spite of geographical disadvantages. Emphasis on and public support for research and development activities have been the main instruments. In recent years the focus and the institutions of this policy have moved from manufacturing technology policy towards a policy. Involving other sectors.

The roots of Finnish innovation policy lie in the technology policy of the 1970s and 80s aiming at increasing the productivity of manufacturing by technological development and by diversifying the industrial economic basis from forest industry towards advanced machinery and electronics. In terms of productivity this policy was quite successful until the 1990s¹. There was also a strong structural change in the industrial basis from forest industry to ICT and other high tech industries during the 1980s and 1990s. This change was linked to the increasing public and private inputs on R&D and improving cooperation between the financing institutions of R&D, universities and other research organisations, and private companies. Nokia's growth to a leading global company in telecommunications and the development of an ICT cluster around it was a crucial factor in this development.

¹ Labour productivity increased by 3,3% p.a. from 1975 to 1995 (Statistics Finland), faster than in EU or USA

Finland has been ranked as one of the innovation leaders of Europe² during the 2000s. However, labour productivity growth has slowed down and the development of several indicators concerning R&D, innovation and technological advantages have become less favourable during past years. Finland's rankings in cross country comparisons with respect to competitiveness and information society have declined. Consequently the need to reconsider and revise the Finnish innovation policy has been widely accepted.

The new national innovation strategy

The new National Innovation Strategy 2008 starts with the observation that in the open, global economy Finland cannot rely on the competitive advantages of previous decades based on industry and technology. In spite of relatively high R&D inputs, advanced technology and a good educational system Finland does not perform well with respect to the internationalization of R&D activities, volume of venture capital investments or number of growth enterprises.

According to the strategy the focus of innovation must be enhanced and change from a supply to a demand orientation. In the strategy "innovation" is defined as *utilized competitive advantage based on knowledge*. The two main objectives are: (1) productivity development based on innovation and (2) obtaining an internationally leading role in innovativeness. The strategy highlights the importance of innovation in the private service sector, as well as in public management and services, in addition to manufacturing.

The strategy suggests several actions to achieve the objectives: administrative reforms, reforming financing and supporting systems for innovation activity, reforming research and higher education institutions, improving education systems, adjusting taxation and improving incentives to attract international specialists, improving the level of management education, and fostering the cooperation between different actors of innovation policy.

Evaluation of national innovation system

An international panel of experts, consisting of leading European and American researchers of innovation, carried out and published an evaluation study on the Finnish national innovation system and the new strategy published in 2009 (Min. of Empl. & Econ. 2009). The new strategy was considered ambitious and contained many good elements but was vague. For example, a shift from the current technology and supply-side emphasis to demand orientation would be challenging and should be considered carefully. The fact that the Finnish system is less international than in many other countries and is increasingly falling behind in this respect is alarming and needs reaction. The evaluation also criticizes the allocation of public resources to

² The European Innovation Scoreboard 2008 (Pro Inno Europe, 2009) ranks Finland second out of 27 EU countries (after Sweden) according to the Summary Innovation Index. R&D expenditure relative to GDP was 3,5 % in 2007 (EU-27 average 1,8 %) while it was less than 2% in 1980s.

innovation actions in relatively disadvantaged regions³. However, the main criticism embrace the coordination and cooperation problems between the numerous actors involved in the innovation policy both at national and regional level.

Regional dimensions of national innovation policy

The public sector share the financing of all R&D expenditure was 24 % in 2008 (Statistics Finland). There are numerous public funds and other financial institutions providing grants and other finance for R&D and other innovation projects. TEKES plays an important role as the coordinator of the Finnish innovation policy. It allocates about 45 % (500M€ in 2008) of the public sector R&D finance (excluding universities and polytechnics) to firms and research institutes. Several ministries are responsible for the implementation of innovation policy; Innovation policy targeted to enterprises is governed by the Ministry of Employment and the Economy; an essential part of the support is allocated from the Government's budget governed by the Ministry of Finance; the Ministry of Education is responsible for the research and education system, consisting of the Academy of Finland, universities, several public research organisations, polytechnics and lower level education, which all play a central role in knowledge diffusion and human capital creation.

The main goals of the innovation policy have been defined at national level with no special emphasis on regional policy. On the other hand, R&D and other innovation activities have become an essential part of regional policy, including the EU cohesion programmes financed by ERDF and ESF. Therefore, national innovation policy and regional policy are closely linked today. The national innovation policy has strong regional dimensions because of the geographical distribution of the actors involved in innovation activities. Many universities, research centres and enterprises with a central role in innovation are located in disadvantaged regions. In Finland, several regional universities were originally founded and located on regional policy grounds. For example, the University of Oulu has been a pioneer in innovative public-private cooperation due to its close and active cooperation with Nokia and several other ICT firms in the region. The Centre of Expertise Programme (OSKE) also fulfils the regional dimension of national innovation policy and is a tool for regional innovation, with ready-made operating models and networks for the national and international markets. It offers networks and services for companies, universities, universities of applied sciences and research institutions (www.oske.net). In its present form the programme is specialized in 13 clusters and works in 21 regions around the country. The new centers of strategic top expertise (SHOKs) launched as a result of the new national innovation strategy and financed mainly by TEKES also have strong regional links.

Regional differences with respect to R&D and innovations

³ This point is considered more carefully in sub-section 3.2.

In Finland there are major regional differences in R&D expenditure. In 2008 the share of the Helsinki region is 41% while it has 34% of GDP and 25% of population (Statistics Finland). The share of 7 leading regions⁴ is 83 % of all R&D expenditure in 2008. At NUTS-2 level R&D expenditure per GDP varies from 6,1% in Pohjois-Suomi⁵ (Northern Finland) to 1,5% in Itä-Suomi (Eastern Finland) while the national average is 3,5% (see appendix C). A similar kind of imbalance is true for industrial innovations⁶: The share of the Helsinki region is 42% and that of the 7 leading regions is 68% (in 2000-2007). However, these regional differences have evened out to some degree during the last 10-15 years.

Innovation policy as part of regional policy

Instruments related to innovation have become an essential part of the *regional* policy in 2000s. In Finland regional policy is based on the Government's regional policy strategy and carried out through both national policy programmes and EU cohesion policy programmes. The Ministry of Employment and the Economy is responsible for regional policy in Finland. At regional level Regional Councils (cooperative organisations of municipalities) and Centres for Economic Development, Transport and the Environment (regional organisations of the state) are responsible for administrating, coordinating and steering both national and EU cohesion programmes. Municipalities and regional cooperative organisations of municipalities are key actors in realizing and financing the programmes at local level. Innovation activities play a central role in all these regional programmes.

2.2 ERDF CONTRIBUTION ACROSS POLICY AREAS

In Finland's cohesion programme strategy 2007-2013 (2007) one of the four priorities of the programme is *promoting innovation activities and networking, and strengthening human capital structures*. The main actions under this priority are:

- supporting joint innovation actions between enterprises, universities and research institutes
- strengthening the structures for innovation and knowledge creation
- support to networking at national and international level.

The importance of the innovation activities in the programme is based on the Lisbon strategy. Nearly two thirds of the total ERDF resources (629M€ out of 977M€) for the whole programme

⁴ Helsinki, Turku, Tampere, Oulu, Jyväskylä, Lahti and Kuopio regions (NUTS-4)

⁵ The high figure in Northern Finland is due to the effect of Oulu region where R&D to GDP ratio is 14,4%, the highest value in Finland (Helsinki region 4,6%).

⁶ Valovirta et. al. (2009); results are based on Sfinno database containing data on more than 4000 industrial innovations made in Finland during 1960-2007.

period are allocated for innovation purposes (table 1 of Annex A). The relative weight of innovation activities has increased in the 2007–2013 programming period compared with the 2000–2006 period .

The 5 regional programmes⁷ under the competitiveness objective have basically similar priorities but differ with respect to emphasis and weightings between regions. In all the programmes the majority of ERDF resources are allocated to innovation support; from 69% in Itä-Suomi (Eastern Finland) down to 59% in Pohjois-Suomi (Northern Finland) However, ERDF contribution to regional R&D differ greatly among programmes: The share of ERDF's innovation support is 1,3 % of all R&D expenses and 5,4% of public sector R&D expenses in Finland. The share is highest in Itä-Suomi (Eastern Finland) 14,4% of all R&D, and lowest in Etelä-Suomi⁸ (Southern Finland) 0,3%. Consequently, ERDF adds significantly to the resources for R&D in the least favourable regions in Finland.

ERDF resources for innovation are allocated to three main themes with approximately one third for each: (1) boosting applied research, (2) promoting innovation friendly environment, and (3) knowledge transfer and poles (see Table 2 in Annex A).

Approximately one third of the support is allocated directly to SMEs. About one fifth is allocated directly to centres of competence and other research centres for R&T projects. About half of resources are reserved for R&D and technology support for SMEs and technology transfer and networking purposes. Centres of competence, Universities and other research institutes as transmission organisations Play a central role in support and networking tasks.

3 EVIDENCE AVAILABLE ON THE PERFORMANCE OF INNOVATION MEASURES CO-FINANCED BY ERDF

The major cohesion policy tool in Finland is the competitiveness objective while the role of the convergence objective via multi-country programmes is quite small. This is also the case for innovation support.

3.1 ACHIEVEMENTS UNDER THE CONVERGENCE OBJECTIVE

Under the convergence programme 2007–13 Finland participates in five multi-country programmes of which four contain support to innovation activities. However, there is only limited information available on results and effects at this stage.

⁷ (1) Etelä-Suomi, (2) Länsi-Suomi, (3) Itä-Suomi and (4) Pohjois-Suomi in the continental Finland, and (5) Åland island.

⁸ The low figure in Etelä-Suomi is due to the high R&D resources of the private sector in the Helsinki region. In fact, ERDF has a significant contribution of R&D in several manufacturing regions in Etelä-Suomi.

Baltic Sea Region Programme: The first priority of the programme is facilitating the generation and dissemination of innovation across the BSR. It is dedicated to core innovations in the field of natural and technical science but also to selected non-technical innovations, such as business services, design and other market-related skills.

The Northern Periphery Programme: The programme aims to help peripheral and remote communities on the northern margins of Europe to develop their economic, social and environmental potential. Through transnational collaboration and innovative actions, the programme seeks to enhance the human and social capital of the area, promote sustainable and balanced development of the territory.

Interreg IVA Pohjoinen: The general objective is to strengthen the competitiveness and cohesion of the region. The main operative aim is to increase the number of competitive enterprises both on the regional and international level and that the research and education organizations of the region create common research and education networks.

Central Baltic INTERREG IV A Programme: There are three priorities that contribute to the concept and objectives of the programme: (1) Safe and healthy environment; (2) Economically Competitive and Innovative Region; (2) Attractive and dynamic societies. Priority 2 emphasizes innovations and broad, qualitative co-operation.

Conclusion: The programmes under the convergence objective are specific for the regions where they operate. In general the cross border programmes focus on innovation activities in connection with networking, cooperation and support to SME's of the regions. A special problem in the Interreg programmes which Finland participates in, especially in Interreg IV A, is the high number of project failures in the technical sphere. Consequently, approved projects are selected from a rather small group of technically acceptable projects which is a risk for the quality of the projects.

3.2 ACHIEVEMENTS UNDER THE COMPETITIVENESS OBJECTIVE

There are five regional ERDF programmes under the competitiveness objective in the period 2007 – 2013. Four regional programmes function in continental Finland: Itä-Suomi (Eastern Finland), Pohjois-Suomi (Northern Finland), Länsi-Suomi (Western Finland) and Etelä-Suomi (Southern Finland). In addition there is a programme for Åland Island. Most regions of Itä-Suomi and Pohjois-Suomi belonged to the Objective 1 area in the 2000–2006 period while large parts of Länsi-Suomi, Etelä-Suomi and the whole Åland were Objective 2 regions⁹.

The programme structures are similar in all regions: all ERDF programmes consist of four priorities: (1) support to enterprises; (2) support to innovation activities and networking and

⁹ In addition, there is an ESF programme of Continental Finland 2007–13 under the competitiveness objective but it is not covered in this evaluation.

strengthening of knowledge structures; (3) Improving accessibility and the operative environment of regions; (4) Environmental effects and sustainable development. In addition, there are some cross priority projects.

In the following paragraphs, a survey of programme progress and evidence on performance (where possible) by policy area are provided

Boosting applied research and product development

The planned allocation during the whole period for this policy area is 34% of all innovation support while the committed allocation by the end of 2009 is 38% (annex A). The majority of the support is directed to SMEs for direct and indirect R&T purposes. Another important target group is R&T projects in research centers. Support to SMEs is allocated mainly by the Regional Centres for Economic Development, Transport and the Environment. Also TEKES allocates funds to R&T projects of firms and it is the main financing source for research centres. The criteria for the support for firms are the same all over the country but the support rate varies from region to region, Northern and Eastern Finland having the highest support rate while the major urban regions in Southern Finland have the lowest. Consequently, the actions in this policy area are quite similar in all regions.

According to Karjalainen¹⁰ et al (2010) direct support to firms is used for projects aiming at product development, improving production technology, internationalization, export and networking with other firms and research organizations. The most important results of the project at firm level are improving competitiveness and productivity while internationalization, networking and environmentally friendly processes of production methods are relatively less important. There were no significant differences between the regions with respect to results obtained in firms.

The above study included a survey of beneficiaries in which they were also asked whether the investment or development activity would have been realized without support grant. Results¹¹ indicate significant dead weight effects in R&T support to SMEs which is typical for the projects of firms with alternative financing options. The dead weight effect is strongest in Southern Finland and least strong in Eastern Finland where alternative financing possibilities are more limited. Similar results of the dead weight effects were found in the evaluation study¹² of the previous period. This study also showed that R&T support was mainly allocated to more dynamic firms with a faster growth rate than average firms in the region.

¹⁰ Unpublished evaluation report on priority (1) prepared under the ongoing evaluation project; the data is based on a questionnaire study to supported firms.

¹¹ The distribution of the replies: yes 9%, yes but more limited 41%, yes but later 23%, no 27%.

¹² Laakso et al (2005): Evaluation study of the EU structural fund programmes (2000–2006) in the administrative branch of the Ministry of Trade and Industry. The results of dead weight effects were based on a survey of beneficiaries.

The study of Laakso et al (2005) also looked at R&T projects of research organizations financed by TEKES. The research organizations were regional universities or polytechnics or research units connected with them. In the majority of cases the project would not have been carried out without TEKES funds, in other words, the leak effects were small. In most cases the aim of the project was developing new technologies or improving old ones. The projects were quite productive in creating innovations¹³. Firms participated actively in the projects giving rise to positive networking effects.

Innovation friendly environment

The planned allocation of all innovation support for this policy area during the whole period is 31% while the committed allocation by the end of 2009 is only 19% (annex A).

Projects vary significantly: The development of municipal data bases by public-private partnership and municipal cooperation (Municipality of Uusikaupunki / Western Finland); Renewed and innovative machinery and equipment in a cluster (Regional developmentn organizations of Northern Central Finland / Western Finland); Eastwood – cluster project for the development of wood products (regional development organizations in Eastern Finland); Developing international network of film and media firms (Regional development organizations and centre of expertise of Lapland / Northern Finland).

Knowledge transfer and support to innovation poles and clusters

The planned allocation of all innovation support for this policy area during the whole period is 35% while the committed allocation by the end of 2009 is 43% (annex A). The majority of projects fall within the FOI code¹⁴ 3. Most of them aim at developing technology or product innovation in a specific sector in a network consisting of a regional university, polytechnics or research institute, local firms from a particular industry and often also municipality or regional development organization, for example: R&D laboratory of design industries (Univ. of Lapland / Northern F.); R&D project of snow and ice construction (Rovaniemi Polytechnic, municipality and a group of tourism firms of the region / Northern F.); R&D centre of wood industry – Woodpolis-Inno (Kuhmo municipality / Eastern F.); Development and education project of water research (Savonia Polytechnics / Eastern F.); Finnish-Russian Innovation University (Lappeenranta Univ. of Technology / Southern F.); Research centre of renewable energy (Lahti Polytechnics and a regional energy firm / Southern F.).

Evaluation results concerning innovation friendly environment, knowledge transfer and clustering

¹³ The projects created in average 0,9 new innovations and 0,3 patents per 1 million € from TEKES.

¹⁴ FOI code 3: Technology transfer and improvement of cooperation networks between small businesses (SMEs), between these and other businesses and universities, postsecondary education establishments of all kinds, regional authorities, research centres and scientific and technological poles (scientific and technological parks, technopoles, etc.) (Annex C)

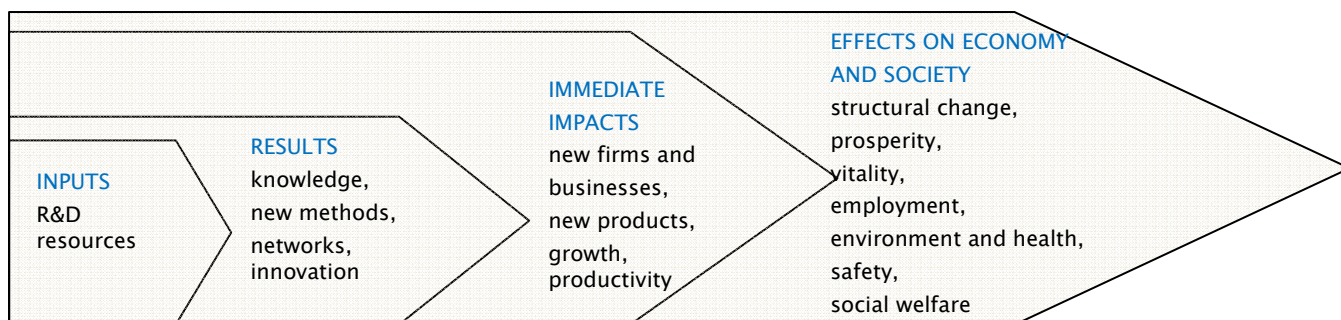
Selection criteria of the innovation cluster projects were considered critically in the ongoing evaluation (Pathan & Hjelt, 2010). The most important selection criteria in all regional programmes are: improvement of competitiveness and employment in the region; improvement of innovation environment and innovation capacity; increased networking and cooperation. The evaluation also highlights the difficulty of asserting the effects of innovation cluster projects. The authors conclude that analysis of clusters, regional expertise centres, innovation environments and networking cannot be based purely on the information from projects. The analysis should be based on wider and more diversified considerations on the regional concentrations of expertise and their activities. The evaluation will proceed in this direction. The evaluators found that, for example, in many cases the data concerning the number of participant firms in networking projects are reported wrongly in the steering data base as the number was significantly higher than in the case studies. The evaluators also point out that some of the basic indicators, e.g. the number of new enterprises or the volume of R&D expenditure, depend on general macroeconomic conditions and the support effects of programmes is difficult to measure. The number of participating firms is an important indicator of the networking effects of a project but the quality of the data should be guaranteed.

An evaluation study from the period 2000–06 (Laakso et al 2005) found a big challenge in cluster and networking projects: many of them are not really based on the real needs and demands of firms but rather on that of the local or regional public sector. Consequently, project quality varies significantly in terms of their ability to create value added for the competitiveness of SMEs. However, there is a real need for cooperation between SMEs and research institutes in R&D because many firms, especially in disadvantaged regions, lack the expertise and resources for their independent R&D projects. This became evident in case studies carried out in the evaluation. Cluster projects often provide the only alternative for many firms for systematic development.

Evidence of the effects of innovation

Evaluation studies on ERDF programmes in Finland, including innovation activities, concentrate on the implementation, resources and results of projects. Typical data sources are monitoring data, interviews of programme coordinators and project leaders and questionnaire surveys of beneficiaries, as in innovation evaluations in EU in general (INNO–Appraisal, 2010). Consequently, evaluation results and conclusions are concerned with the efficiency of programmes and projects rather than the effects on regional developments. However, some recent studies (outside ERDF programme evaluations and with a broader view of innovation) provide evidence¹⁵ of the effects of innovation support on the competitiveness of firms and the economic performance of regional economies. TEKES (2008) summarizes the chain effect as follows:

¹⁵ TEKES (2008) report “The effects of innovation activity” contains a summary of the studies on the theme.

The effects of innovation activity (TEKES 2008)

Several studies show that public support for R&D to firms increases the firms' own inputs for R&D (e.g. Ali-Yrkkö 2004; Einiö 2009). There is strong evidence¹⁶ that R&D inputs have a positive effect on the productivity of firms (e.g. Ali-Yrkkö & Maliranta 2006; Ottaviano et al 2009). TEKES (2010) points out that the results of R&D manifest themselves as knowledge, networking and innovation which create new or improved products, services, methods, processes, organizations and actions (e.g. Beers et al 2008). There is also a clear positive relation between regional/national R&D inputs relative to GDP, and GDP per capita¹⁷ (e.g. Huovari et al 2001; Berghäll et al 2006; European Innovation Scoreboard 2008). This kind of evidence strongly supports public R&D inputs and other innovation activities and using innovation activities as a regional policy instrument.

Externalities and spillover effects are a crucial feature of knowledge and innovations (e.g. Audretsch & Feldman 2004). Gathering creators and potential users of knowledge and innovation makes them more widespread and increase productivity. This is the main reasoning behind clustering and networking activities. However, one of the basic results of urban economics is that the geographical concentration of innovative resources, development oriented firms and innovative people, increase the efficient use of innovative inputs and adds innovative output (Audretsch & Feldman 2004). Consequently, large and diversified urban areas provide the best environment for innovation. This is a challenge for regional innovation policy based on clustering and networking in a country like Finland, where the disadvantaged areas are mainly rural or manufacturing oriented regions with low population densities and communities are distant from one another.

¹⁶ The studies are in general based on the economic hypothesis that R&D inputs lead to technological improvements causing a shift in production function leading to increased productivity at firm level. The empirical evidence of Ali-Yrkkö et al and Ottaviano et al is based on econometric studies using firm level data.

¹⁷ This evidence is based on the assumption that the relation explained in the previous footnote can be aggregated from firm level to regional level. The results of Huovari and Berghäll are based on econometric estimations using regional level data while E.I.Scoreboard is based on rather simple correlation analysis.

The study of Ottaviano, Kangasharju and Maliranta (2009) shows that the relation between public R&D support and firm level productivity is rather complicated, and increased public R&D inputs do not automatically lead to expected effects in disadvantaged regions¹⁸. According to the study productivity is lower in disadvantaged than advantaged regions and the gap has widened during the period 1997–2007. This divergence is mostly due to the fact that more productive firms are able to achieve larger employment shares in advantaged than disadvantaged regions. The firms receiving R&D support are on average more productive than non-supported firms both in advantaged and disadvantaged regions. However, the average productivity of supported firms compared to not-supported firms has fallen in disadvantaged regions while receiving and after having received public support, while in advantaged regions the productivity has risen. In disadvantaged regions R&D support is associated with the reallocation of employment towards less productive firms but this does not happen in advantaged regions. On the basis of their results the authors criticize the R&D support criteria in Finland. This criticism is one of the main points in the international evaluation of the Finnish innovation system (Min. of Empl. & Econ. 2009).

Results of Ottaviano et al are to some extent in conflict with evaluation studies of the earlier period (e.g. Laakso et al 2005) which have shown that R&D support has fostered growth and competitiveness in supported firms. It must be noted that the evaluation study, as most other evaluation studies in Finland, was based on data obtained from supported firms in disadvantaged regions, without any rigorous comparison with a reference group while Ottaviano et al analyze productivity development relative to not-supported firms in favorable regions which, in the case of Finland, is a challenging reference group. The productivity of supported firms in disadvantaged regions has increased but less than that of the control group.

In any case it must be concluded that also evaluation studies should proceed towards rigorous comparisons of supported and not-supported groups instead of gathering and analyzing data only from the supported group.

¹⁸ The study is based on an exceptionally large firm level panel data administered by Statistics Finland, covering the years 1997–2007. The data makes it possible to analyze the productivity (value added per employee) level differences and productivity change in time between different types of regions (Objective 1 & 2 v.s. “white” regions). They also analyze the effect of R&D support on productivity because the data contains firm level information on public R&D support. Firms that have not received any support are used as reference group. R&D support is a grant either from Regional Centre for Economic Development etc. or from TEKES and the support rate is higher in disadvantaged than in advantaged regions. The analysis is based on econometric methods designed for panel data.

4 CONCLUSION: MAIN CHALLENGES FACED BY COHESION POLICY PROGRAMMES

The new national innovation strategy (2008) aims at productivity development based on innovation and obtaining an internationally leading role in innovativeness. The share of ERDF's innovation support is 1,3 % of all R&D expenses and 5,4% of public sector R&D expenses in Finland in 2008. The share is highest in Eastern Finland, 14,4% and lowest, in Southern Finland, 0,3%.

Consequently, ERDF adds significantly to the resources for R&D in the least favourable Eastern and Northern regions in Finland. In Finland's cohesion programme strategy 2007–2013 (2007) one of the four priorities of the programme is *promoting innovation activities and networking, and strengthening human capital structures*. Innovation activities are realised mainly by the five regional programmes of the competitiveness objective. Nearly two thirds of the total ERDF resources are allocated for innovation purposes to three main themes: (1) boosting applied research, (2) promoting innovation friendly environment, and (3) knowledge transfer and poles.

Results of innovation support

Evaluation results concerning innovation activity in Objective 1 and 2 programmes of the period 2000–06 were promising. The programmes were successful in improving the competitiveness and networking of SMEs, including those in rural areas. Support for life-long learning and business services helped to improve managerial skills in SMEs, to increase innovation activities and so strengthen their competitiveness leading to a higher rate of growth. They helped to increase educational attainment levels, the skills of the work force and innovative capacity, also in rural areas. In Objective 2 areas, the major urban centres with universities and other institutes of higher education and research centres were best able to benefit from the allocation of resources to R&D and other innovation activities.

The significant regional differences with respect to R&D expenditure evened out to some degree during the 2000s. Especially medium sized university regions have improved. In the case of industrial innovations both regional university centers have caught up as regional manufacturing centers. On the other hand, the many small manufacturing towns and remote rural areas have not improved during the last ten years in terms of innovation and productivity of firms nor in terms of employment and population developments.

Views of experts

Many experts were interviewed during the ongoing evaluation project of ERDF programmes 2007–13 (appendix D). In general, the high priority and resource allocation of innovation activities in the programmes were considered a positive factor and direct support to firms and the support to clustering and networking activities are considered important. The depression has caused uncertainty concerning the financing of some strategic projects. Some experts are worried about

the continuity of the development activity, especially related to new research organizations dependent on project finance from ERDF and other sources. There were also comments about the quality and real effects of some networking projects while the overall quality of the projects was considered good.

Some experts observe a permanent conflict between the national efficiency and regional equality in the resource allocation of innovation support. The experts disagree on the role of rural areas and small manufacturing regions with respect to innovation activities. Some maintain that only major urban areas can provide the critical mass necessary for R&D and systematic innovation. For this reason, resources for innovation support should be concentrated in the regions with the greatest capacity to utilize them effectively. Others say that potential capacity for innovative activities can be found in all regions and for this reason also rural and small manufacturing regions should have access to innovation resources on the basis of their specialization and capacity. Finally, the choice between the national efficiency and regional equality objectives is a political choice and a “right solution” cannot be given on the basis of evaluation research.

Challenges of innovation policy

There is strong evidence that public support to R&D and other innovation activities can improve competitiveness of disadvantaged regions. However, there are challenges in regional innovation policy.

Research evidence shows that large and diversified urban areas provide the best environment for innovations. In the case of Finland the disadvantaged regions which are the main target of the ERDF programmes are mainly rural and small manufacturing regions with low population density and long distances between communities. Support to innovation poles and clusters in this kind of area is more challenging than in a larger regions with critical mass of innovation capacity. The evaluations show that there are successful innovation projects also in most disadvantaged regions but they are based on different preconditions (e.g. concentration of special knowledge in the specific region, like boat production on the North–Western coast in Finland).

In the future there should be more emphasis on the special requirements of networking and cluster projects in the most disadvantaged regions.

In the case of direct innovation support to firms there is evidence that the support is mainly channeled to firms which are more productive and have a faster than average growth rate both in the advantaged and in disadvantaged regions. However, the studies show that in Finland innovation support to firms has not diminished the major productivity differences between firms in advantaged and disadvantaged regions. There are also significant dead weight effects in the innovation support, especially in the strongest regions.

The issue of whether support measures should target the specific features of a firm independent of its location or rather target firms located in less developed regions should be carefully considered.

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THE EXPERTS' ROLE IN EVALUATIONS AND OFFICIAL STUDIES

Urban Research TA Ltd / Seppo Laakso and/or Päivi Kilpeläinen have participated in the following evaluation studies of EU cohesion policy programmes of Finland's national regional development programmes:

- The ongoing evaluation of the ERDF Regional Competitiveness and Employment Objective programmes 2006–2013 in Finland. Päivi Kilpeläinen and Seppo Laakso belong to the evaluation team.
- Ex Post Evaluation of Cohesion Policy Programmes 2000–2006 financed by the European Regional Development Fund in Objective 1 and 2 Regions. Work package 1: Coordination, analysis and synthesis. Task 4: Development and achievements in Member States. FINLAND. 2009. Applica, Ismeri Europa & The Wien Institute for International Economic Studies.
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ANNEX A – BACKGROUND DATA ON EU COHESION POLICY SUPPORT TO INNOVATION

The data on the ERDF resources allocated cover the FOI codes defined as relevant to the support of RTDI, or, more precisely, those that cover the bulk of the resources devoted to innovation (see annex B for the list of codes). Experts should assess the appropriateness of this common definition and, if necessary, adjust the coverage to the national case in consultation with the core team. Note: experts should complete the final column only in respect of the National and Regional programmes totals and not for each regional programme.

Table 1 – Total ERDF resources allocated per programme (2007–2013)

FINLAND				
Programme	Total ERDF resources for innovation	Total ERDF	Innovation support as % of total ERDF	Main initiatives implemented
Itä-Suomen EAKR-toimenpideohjelma 2007-2013	250 777 115	365 564 309	68,6%	Supporting joint innovation actions between enterprises, universities and research institutes. Strengthening the structures for innovation and knowledge creation. Supporting networking at national and international level. Investment in firms directly linked to research and innovation.
Pohjois-Suomen EAKR-	183 431 921	311 273	58,9%	see above

toimenpideohjelma 2007-2013		152		
Länsi-Suomen EAKR-toimenpideohjelma 2007-2013	100 725 537	159 375 850	63,2%	see above
Etelä-Suomen EAKR-toimenpideohjelma 2007-2013	92 364 226	138 063 117	66,9%	see above
Operativt program för Europeiska regionala utvecklingsfonden på Åland 2007-2013	1 980 349	3 125 552	63,4%	see above
Total Objective 2	629 279 148	977 401 980	64,4%	see above
Overall total	629 279 148	977 401 980	64,4%	see above

* The term initiatives should be understood in a wide sense covering measures, projects, actions and so on co-financed by the ERDF. Among these, experts should identify the main kinds of intervention.

Source: core team on EC data.

As in the case of Table 1, experts may suggest a wider or narrower coverage of innovation in Table 2 than that defined here, which would imply adding or subtracting particular FOI codes. In this case, experts should consult the core team to explain their reasons for so doing.

Table 2 – ERDF contribution to innovation by policy area (2007–2013)

b – Competitiveness and Employment Objective

FINLAND		
Policy Area	Categorisation of Expenditure (FOI codes)	Total ERDF
Objective 2		
Assistance to SMEs for the promotion of environmentally-friendly products and production processes (...)	06	38 572 460
Investment in firms directly linked to research and innovation (...)	07	85 022 039
Other measures to stimulate research and innovation and entrepreneurship in SMEs	09	51 439 795
R&TD activities in research centres	01	41 441 000
Boosting applied research Total		216 475 294
Advanced support services for firms and groups of firms	05	43 832 704
Developing human potential in the field of research and innovation, in particular through post-graduate studies ...	74	7 968 793
Information and communication technologies (...)	11	17 997 918
Information and communication technologies (TEN-ICT)	12	
Other measures for improving access to and efficient use of ICT by SMEs	15	54 959 522
Services and applications for citizens (e-health, e-government, e-learning, e-inclusion, etc.)	13	43 726 759
Services and applications for SMEs (e-commerce, education and training, networking, etc.)	14	25 230 639
Innovation friendly environment Total		193 716 335
Assistance to R&TD, particularly in SMEs (including access to R&TD services in research centres)	04	56 554 578
R&TD infrastructure and centres of competence in a specific technology	02	85 703 780
Technology transfer and improvement of cooperation networks ...	03	76 829 161
Knowledge transfers and poles Total		219 087 519
Total Objective 2		629 279 148

Source: core team on EC data.

Committed allocation, Dec. 2009

Policy area	Categorisation of expenditure (corresponding FOI codes)	Total ERFD	%	
			Regional share	National share
Innovation friendly environment	05	23 486 322	54,4	45,6
	11	1 777 432	43,9	56,1
	12			
	13	3 900 762	40,3	59,7
	14	3 644 942	52,6	47,4
	15	4 406 869	75,0	25,0
	74	6 894 921	66,5	33,5
Knowledge transfer and support to innovation poles and clusters	02	36 369 425	40,9	59,1
	03	57 436 908	54,4	45,6
	04	6 848 934	53,6	46,4
Boosting applied research and product development	01	49 835 960	26,0	74,0
	06	311 000	30,0	70,0
	07	1 214 403	75,2	24,8
	09	37 823 007	57,8	42,2
Total		233 950 885	47,3	52,7

ANNEX B – CLASSIFICATION OF INNOVATION POLICY AREAS, INSTRUMENTS AND BENEFICIARIES

Policy area	Short description
Innovation friendly environment	<p>This category covers a range of actions which seek to improve the overall environment in which enterprises innovate, and notably three sub groups:</p> <ul style="list-style-type: none"> • innovation financing (in terms of establishing financial engineering schemes, etc.); • regulatory improvements and innovative approaches to public services and procurement (this category could notably capture certain e-government investments related to provision of services to enterprises); • Developing human capital for the knowledge economy. This category will be limited to projects in higher education aimed at developing industry orientated courses and post-graduate courses; training of researchers in enterprises or research centres. <p>The category also covers initiatives geared towards improving governance capacities for innovation and knowledge policies (e.g. specific technical</p>

	assistance funding, support for regional foresight)
Knowledge transfer and support to innovation poles and clusters	<p>Direct or indirect support for knowledge and technology transfer:</p> <ul style="list-style-type: none"> • direct support: aid scheme for utilising technology-related services or for implementing technology transfer projects, notably environmentally friendly technologies and ITC; • indirect support: delivered through funding of infrastructure and services of technology parks, innovation centres, university liaison and transfer offices, etc. <p>Direct or indirect support for creation of poles (involving public and non-profit organisations as well as enterprises) and clusters of companies</p> <ul style="list-style-type: none"> • direct support: funding for enterprise level cluster activities, etc. • indirect support through funding for regrouping R&D infrastructure in poles, infrastructure for clusters, etc.
Boosting applied research and product development	<p>Funding of “Pre-competitive development” and “Industrial research” projects and related infrastructure. Policy instruments include:</p> <ul style="list-style-type: none"> • aid schemes for single beneficiary or groups of beneficiaries (including IPR protection and exploitation); • research infrastructures for non-profit/public organisations and higher education sector directly related to universities. <p>Any direct or indirect support for the creation of innovative enterprises (spin-offs and start-ups)</p>

Instruments	Short description
Infrastructures and facilities	Building and equipment for laboratories or facilities for university or research centres, Telecommunication infrastructures, Building and equipment for incubators and parks for innovative enterprises
Aid schemes	Grants and loans for RTDI projects Innovative finance (venture capital, equity finance, special bonds, etc.) for innovative enterprises
Education and training	Graduate and post-graduate University courses Training of researchers

Beneficiaries	Short description
Public sectors	Universities

	National research institutions and other national and local public bodies (innovation agencies, BIC, Chambers of Commerce, etc..) Public companies
Private sectors	Enterprises Private research centres
Others	NGOs
Networks	cooperation between research, universities and businesses cooperation between businesses (clusters of SMEs) other forms of cooperation among different actors

ANNEX C – CATEGORISATION OF EXPENDITURE TO BE USED FOR CALCULATING EU COHESION POLICY RESOURCES DEVOTED TO INNOVATION

FOI Code	Priority Theme
	Research and technological development (RTD), innovation and entrepreneurship
01	R&TD activities in research centres
02	R&TD infrastructure (including physical plant, instrumentation and high-speed computer networks linking research centres) and centres of competence in a specific technology
03	Technology transfer and improvement of cooperation networks between small businesses (SMEs), between these and other businesses and universities, postsecondary education establishments of all kinds, regional authorities, research centres and scientific and technological poles (scientific and technological parks, technopoles, etc.)
04	Assistance to R&TD, particularly in SMEs (including access to R&TD services in research centres)
05	Advanced support services for firms and groups of firms
06	Assistance to SMEs for the promotion of environmentally-friendly products and production processes (introduction of effective environment managing system, adoption and use of pollution prevention technologies, integration of clean technologies into firm production)
07	Investment in firms directly linked to research and innovation (innovative technologies, establishment of new firms by universities, existing R&TD centres and firms, etc.)
09	Other measures to stimulate research and innovation and entrepreneurship in SMEs
	Information society
11	Information and communication technologies (access, security, interoperability, risk-prevention, research, innovation, e-content, etc.)
12	Information and communication technologies (TEN-ICT)
13	Services and applications for the citizen (e-health, e-government, e-learning, e-inclusion, etc.)

14	Services and applications for SMEs (e-commerce, education and training, networking, etc.)
15	Other measures for improving access to and efficient use of ICT by SMEs
	Human capital
74	Developing human potential in the field of research and innovation, in particular through post-graduate studies and training of researchers, and networking activities between universities, research centres and businesses

ANNEX D –R&D RESOURCES IN FINLAND

Region (NUTS2) and major urban regions (NUTS4)	Total ERDF resources for innovation 2007–2013 (M€)	ERDF resources for innovation / year (M€)	R&D resources (M€) 2008	ERDF resources for innovation / year, % of all R&D 2008	GDP 2007 (M€)	R&D resources 2008, % of GDP 2007	Population (1000)	ERDF resources for innovation per capita (€)
Southern Finland	92,3	13,2	3 832,7	0,3	101935	3,8	2 623	5,0
Helsinki	-	-	2 786,5	-	60 743	4,6	1 256	-
Turku	-	-	365,9	-	9 681	3,8	303	-
Eastern Finland	250,8	35,8	249,4	14,4	17 157	1,5	659	54,4
Kuopio	-	-	112,5	-	3 633	3,1	119	-
Western Finland	100,7	14,4	1 641,9	0,9	40 539	4,1	1 342	10,7
Jyväskylä	-	-	253,3	-	4 802	4,9	167	-
Tampere	-	-	1 087,9	-	12 031	9,0	329	-
Northern Finland	183,4	26,2	1 144,3	2,3	18 828	6,1	638	41,1
Oulu	-	-	1 037,2	-	7 242	14,3	211	-
Ahvenanmaa	2	0,3	2,8	10,7	1 123	0,2	27	10,5
Total	629,3	89,9	6871,1	1,3	179 659	3,8	5 289	17

ANNEX E –EXPERTS INTERVIEWS

Western Finland:

Pentti Kuikka, kehittämispäällikkö (development manager)

Pirjo Peräaho, ohjelmapäällikkö (programme manager)

Jukka Alasentie, aluekehitysjohtaja (regional development director)

Marja Karvonen, aluekehityspäällikkö (regional development manager)

Eastern Finland:

Henrik Rissanen, aluekehitysjohtaja (regional development director)

Riitta Koskinen, kehittämisjohtaja (development director)

FI_EvalNet_Final draft Innovation paper_August 2010

Juhani Kärkkäinen, aluekehitysjohtaja (regional development director)

Satu Vehreävesa, ohjelmapäällikkö (programme manager)

Juha Pulliainen, työllisyys ja yrittäjyys vastualueen päällikkö (manager responsible for employment and entrepreneurship)

Northern Finland:

Tuija Puumala, EU koordinaattori (EU coordinator)

Heikki Laukkanen, ohjelmakoordinaattori (programme coordinator)

Pentti Malinen, kehitysjohtaja (development director)

Heikki Ojala, aluekehityspäällikkö (regional development manager)

Kaj Lyyski, kehitysjohtaja (development director)

Maiju Hyry, kehittämisjohtaja (development director)

Samu Rytönen, erikoissuunnittelija (special planner)

Southern Finland:

Marja Koivula, kehittämisjohtaja (development director)

Merja Rossi, EU koordinaattori (EU coordinator)

Carola Gunell, erikoissuunnittelija, EU koordinaattori (EU coordinator)

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