

**How local and regional authorities can best support innovation and use it to restore economic growth and employment**

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# Executive Summary

- *This report addresses the question of how local and regional authorities can best support innovation and use it to restore economic growth and employment.*
- *Traditionally, innovation has been seen as a process of ‘technology push’: the introduction of changes in production techniques and processes.*
- *As the service sector has become more prominent, and new business models have emerged as a source of competitive advantage and success, innovation has begun to be understood in a wider sense.*
- *In the report, ‘innovation’ refers to ‘changes in technical and business processes that generate new sources of value’.*
- *Furthermore, innovation has increasingly been seen as an open process, involving interaction with players outside the company.*
- *At European level, a number of priorities have emerged in recent years that shape understanding of innovation policy. They include:*
  - *The need for a broad and integrated approach;*
  - *The key role of the regions, because of their physical proximity to the main stakeholders;*
  - *Innovation in services;*
  - *Cluster development: the promotion of lead markets and creative clusters;*
  - *Research-based strategies relying on co-operation between universities, research centres, enterprises and regional authorities;*
  - *The importance of strong support services for business.*
- *Classifications are drawn from the literature for types of intervention, the degree of autonomy of the regions and local authorities, and relative success in promoting innovation.*
- *The methodology used to identify the literature is explained, including keywords used in searches. Fifty-three articles were identified that met the search criteria to some degree.*

- *There is very little empirical evidence available on impact, such as GDP growth, job creation or implications for public finances arising from regional innovation initiatives.*
- *Evidence of the impact of initiatives is presented in the following areas:*
  - *Innovation strategy development;*
  - *Exploiting universities' knowledge base;*
  - *Technology centres;*
  - *Financial instruments;*
  - *Science parks and incubators;*
  - *Cluster promotion strategies;*
  - *Sector-based development.*
- *The results cited mainly relate to indicators of innovative activity in businesses, the number of new businesses and the number of jobs created, but many studies focus more on processes than results, and particularly on the role of regional authorities.*
- *A table is presented summarising the distribution of studies that comment on the results of different kinds of intervention.*
- *The outlines of a flexible framework strategy are then presented, in a form that is applicable to different kinds of regions in terms of their legal competences and their current levels of innovation.*
- *The framework strategy recommends steady progression through five stages, beginning with strong initial policy leadership.*
- *The results of a press review are then presented. This, together with the literature review, gave rise to a series of case studies that are presented in a standard format.*
- *Finally, a bibliography is provided, along with a summary of the search strategies used in the exercise.*
- *A table summarising the literature reviewed is appended.*

# 1. Introduction

Investments in R&D and innovation have long been identified as drivers of prosperity and major contributors to social and individual wellbeing. In the past decade, notably in the context of the Lisbon Strategy, the European Union has put a great deal of effort into promoting Research, Technological Development and Innovation (RTDI) as a vehicle for economic growth and job creation and as a means of meeting major social and environmental objectives. Because of their proximity to those who are active on the ground, local and regional authorities have been seen as a critical element in delivering the overall strategy for RTDI. At all levels in Europe, however, it is acknowledged that there is still a long way to go.

Responding to the challenge of promoting RTDI is not a straightforward matter for local and regional authorities (LRAs). The huge number of authorities across Europe face very diverse circumstances in terms of the human, physical and financial resources at their disposal and the needs of their communities. It is not possible or even advisable for each of them to adopt the same approach. Nonetheless, there are certain issues that are common across different situations and also tried and tested responses that have been seen to work in disparate places.

The purpose of this report is to directly and pragmatically address the question of how local and regional authorities can best support innovation and use it to restore economic growth and employment. After providing an initial orientation in the form of a brief overview of the main issues concerning current definitions of innovation and a reference to the main threads of policy at a European level, the report surveys the literature on innovation activities at sub-national level over the period 2000-2009, setting out evidence of results where available, pointing to best practice, and highlighting the benefits to be gained from fostering innovation. The literature reviewed is presented systematically and with a synthetic overview of the main elements identified. Examples of LRA innovation initiatives have also been identified in a search of press coverage. This investigative basis is used to derive a set of policy options and draw conclusions on desirable outcomes at regional and local level. A series of innovation-based development trajectories are proposed. Finally, case study material is provided that will form the basis for a brochure to be published by the Committee of the Regions (CoR).



## 2. Contextual background

It will help in subsequent sections if some initial consideration is given to the concept of innovation, since although the term is readily understood in a general sense, its connotation in relation to modern economic processes has evolved considerably in the last twenty years and sometimes with some controversy. A brief review of the current conceptual framework will help to explain the policy options that are open to LRAs for using innovation as a source of growth and employment.

Traditionally innovation has meant the introduction of changes in production techniques and processes that lead either to an increase in output or to an improvement in its usefulness or quality. Public support for this type of innovation has focused on the application of science to the development of products or technological processes and has involved measures ranging from greater funding for the science base in higher education and facilitation of transfer of science and technology through science parks and incubators to the funding of R&TD within businesses. This type of approach has broadly been referred to as ‘technology push’.

Gradually, however, especially as the service sector became a more significant part of most economies, it was understood that changes in other areas of business activity could be as important as changes in production techniques. Initially it was realised that improvements in product design and presentation and, more generally, changes that responded to shifts in consumer requirements and expectations were a significant factor. Subsequently, attention was paid to the restructuring of financial and organisational arrangements within and between businesses and the development of new ‘business models’ as a source of competitive advantage and business success. With the growth of the knowledge economy and a better appreciation of the place of human knowledge and skills in modern economic processes, accompanied by a growth in the creative sector, there has been an increasing interest in the role of inspiration and creativity in economic development. This is not to say, of course, that science and its application is no longer of importance. On the contrary, science continues to be the basis for the generation of a large amount of new knowledge. However, exploiting this knowledge in forms of innovation that generate economic value is seen to be a more complex affair, with many more dimensions than previously thought.

Furthermore, in addition to changes in the perceived nature of innovation, there have also been major developments in our understanding of the processes involved. Most importantly, innovation is understood these days not to be

primarily based on the activities of inspired individuals or isolated research teams, but to be a process that involves significant interaction with others. One aspect of this interaction is through patterns of ‘open innovation’, initially described by H. Chesbrough<sup>1</sup> in 2003. Through these processes, users of goods and services or those active in the supply chain can contribute to their on-going development. The process is clearly evident in the development of ‘apps’ for the iPhone, for example. Other forms of interaction can arise through the proximity of enterprises engaged in similar activities in local or regional agglomerations, known as ‘clusters’. Through collaborative competition, clusters help the spread of new ideas and know-how, generate pools of skilled labour and sympathetic sources of finance and gain economies in marketing and sales.

The discussion in the rest of this briefing paper will take account of the current perceptions of innovation that have been sketched out in the previous paragraphs. By way of summary we can say that the term ‘innovation’ will be used to mean:

‘Changes in technical and business processes that generate new sources of value’.

This broader understanding of innovation is now well established in policies adopted at European level.

It is not the purpose of this report to cover policy documents at any level. However, for the purposes of the analysis that follows, it will be useful to identify some of the current themes in European policy on innovation, especially insofar as they affect LRAs, and see to what extent these themes are picked up and developed in the academic literature. Equally, there are some important sources of information brought together at this level that it will be useful to refer to.

At this stage we would like to draw attention to the following themes:

*A broad approach:* innovation as understood in the broader sense outlined above can generally be found in EU innovation policy. The scene was set by the 2006 Communication from the European Commission ‘Putting knowledge into practice: A broad-based innovation strategy for the EU’<sup>2</sup>, which developed a

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1 H. Chesbrough, ‘Open Innovation: The New Imperative for Creating and Profiting from Technology’ (2003).

2 Communication from the European Commission ‘Putting knowledge into practice: A broad-based innovation strategy for the EU’ COM(2006) 502 final of 13.9.2006.

number of its proposals from the Aho Report<sup>3</sup> on creating an innovative Europe, and which continues to inform many elements of EU policy.

*An integrated approach:* the broad-based innovation strategy and subsequent documents, such as the 2007 Communication on ‘Competitive European Regions through Research and Innovation’<sup>4</sup>, see public authorities, including regions, developing synergies between the main EU support policies: Research, Competitiveness and Innovation, and Cohesion Policy, and promoting an integrated approach to innovation through a range of policies from education and procurement to business support, standards and regulation.

*Key role for the regions:* many policy documents see a key role in innovation policy for the regions (and by implication local authorities) because of their close physical proximity to the main public and private sector players.

*Exchange of best practice:* in line with the Lisbon methodology, policy documents and operational initiatives, such as Regions for Economic Change under Cohesion policy, put a lot of emphasis on mutual learning and exchange of best practice.

*Cluster development:* the promotion of world-class clusters is seen as particularly relevant at regional level, for instance in the 2008 Communication on ‘Towards world-class clusters in the European Union’<sup>5</sup>. However, this document argues that new cluster initiatives should be carefully designed and underpinned by a very clear rationale based on precisely identified business interests, regional strengths, specific competences, knowledge hubs of international excellence and market foresight.

*Lead markets:* sectors that are particularly susceptible to public encouragement and that can build on European strengths have been identified as: e-Health, protective textiles, sustainable construction, recycling, bio-based products, and renewable energies. The Lead Markets Initiative promotes action to lower barriers to introducing new products or services onto the market.

*Research-based strategies:* establishment of research-based strategies relying on co-operation between universities, research centres, enterprises and regional authorities in encouraging research-driven clusters is supported, for instance, by

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<sup>3</sup> ‘Creating an Innovative Europe’ - report by an independent expert group on R&D and innovation chaired by Esko Aho.

<sup>4</sup> Communication from the European Commission ‘Competitive European Regions through Research and Innovation - A contribution to more growth and more and better jobs’ COM (2007) 474 final of 16.8.2007.

<sup>5</sup> Communication from the European Commission ‘Towards world-class clusters in the European Union: implementing the broad-based innovation strategy’ COM(2008)652 final of 17.10.2008.

the Regions of Knowledge initiative, implemented under FP7 as part of the European Research Area (ERA) policy.

*Innovation in services:* as part of the broad-based approach to innovation, the importance of encouraging innovation in services and the business models that deliver it, is recognised<sup>6</sup>.

*Creative clusters:* there has been growing interest in the potential of the cultural and creative sectors to stimulate innovative creativity and contribute to local and regional development<sup>7</sup>.

*Business support services:* a recurring theme is the importance of effective business support in the form of advice and facilities such as science parks and incubators, but also specialised services, such as support for managing and enforcing IPR<sup>8</sup> and access to appropriate finance.

*Demand for innovative products and processes:* frequent reference has been made (for instance in the broad-based strategy) to the importance of sustaining demand for innovative products and services, not least through the procurement practices of public authorities.

Finally, by way of introduction, key sources of information on innovation processes at regional level in particular include:

Two initiatives by DG Enterprise and Industry in the European Commission:

- *Pro-Inno*<sup>9</sup>, which aims to be the focal point for innovation policy analysis and policy cooperation in Europe.
- *Europe INNOVA*<sup>10</sup>, which works at a more operational level to promote and improve support for innovation of all kinds.

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<sup>6</sup> See, for instance Commission Staff Working Document ‘Challenges for EU support for innovation in services – Fostering new markets and jobs through innovation’ SEC (2009) 1195 of 09.09.2009 PROINNO Europe Paper n° 12.

<sup>7</sup> See, Commission Communication on ‘A European agenda for culture in a globalizing world’ COM/2007/0242 final; KEA European Affairs ‘The Economy of Culture in Europe’ Oct 2006 and ‘The Impact of Culture on Creativity’ June 2009; CSES ‘Study on the Contribution of Culture to Local and Regional Development - Evidence from the Structural Funds’ March 2010.

<sup>8</sup> See CSES, Report by the IPR Enforcement Expert Group ‘Making Intellectual Property Rights Work for Small and Medium-size Enterprises – Preparation and Enforcement’ April 2009.

<sup>9</sup> <http://www.proinno-europe.eu/>.

<sup>10</sup> <http://www.europe-innova.org>.

*The Regional Innovation Scoreboard*<sup>11</sup> - provides a comparative assessment of innovation performance across the NUTS 2 regions of the European Union and Norway.

*The European Cluster Observatory*<sup>12</sup> gathers information on more than 2000 clusters across Europe and provides cluster maps and reports on priority sectors.

## 2.1 Typology of interventions

There is, therefore, a wide range of innovation measures and policy tools that are relevant to the regional level and that are used by regional and local governments.

The next step in the analysis is to follow this broad sketch of innovation issues at regional level with a categorisation of the different forms of regional intervention discussed in the literature. Of course, initially this categorisation has to be provisional, but it does help in a general ordering of the evidence that is presented subsequently.

There has been a widespread adoption of what Moulaert and Sekia (2003)<sup>13</sup> call territorial innovation models<sup>14</sup> (combining a theoretical analysis of the advantages of agglomeration and the role of institutions with empirical evidence from Italian districts or successful areas like Silicon Valley. In the EU this model was promoted at regional level by implementing a series of regional innovation support programmes (RTPs, RIS, RITTS) in the less developed regions during the 1990s) and the subsequent Regional Programmes for Innovative Actions in the period 2000-2006. In many cases they provided the starting point for implementation of various regionally focused innovation measures by either national or regional authorities themselves. In this context, individual measures and tools are promoted as constituent parts of wider development strategies for the regions.

In order to identify and analyse these interventions, it is necessary to develop a typology or structured classification. The regional innovation systems literature (e.g. Cooke, 2001<sup>15</sup>; Doloreux, 2002<sup>16</sup>) provides the basis for identifying all the relevant policy measures that focus both on knowledge generation and the

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<sup>11</sup> <http://www.proinno-europe.eu/page/regional-innovation-scoreboard>.

<sup>12</sup> <http://www.clusterobservatory.eu/>.

<sup>13</sup> Moulaert, F., Sekia, F., (2003), Territorial innovation models: a critical survey, *Reg. Studies* 37, 289-302.

<sup>14</sup> This term is used by the authors to refer to all different models of regional innovation where local institutional dynamics play a role.

<sup>15</sup> Cooke, C., (2001), Regional Innovation Systems, Clusters, and the Knowledge Economy, *Industrial and Corporate Change*, 10 (4) : 945-974.

<sup>16</sup> Doloreux, D; What we should know about regional systems of innovation, *Technology in society*, 24 (3) : 243-263.

supply and demand of technology. It also identifies the legal and institutional framework, the available financial support mechanisms, the presence of intermediation and transfer mechanisms, and the cooperation and partnership developed among the main players – including the regional authorities, universities and industry. The work of the Fraunhofer institute<sup>17</sup> on the typology of measures is quite helpful in this regard, since it is based on an analysis of the list of actual innovation measures published by the European Commission's Directorate-General for Enterprise and Industry in the Trendchart on Innovation Reports<sup>18</sup>. We generally agree with their analysis and attempt to make use of the following categories of instrument:

1. Measures aimed at improving **innovation governance** and strategic intelligence for policy making, focusing primarily on assessments, foresight activities and innovation strategy development.
2. Measures aimed at fostering an **innovation friendly environment**, focusing on simplification of administrative procedures or improvement of the regulatory environment concerning IP issues.
3. Support for higher education and **human capital** development, focusing on the development of infrastructure for education and training including universities and vocational training centres.
4. Development of **research infrastructure** in universities and research centres, including provision of funds for R&D for public or private research or the development of new research infrastructure (e.g. specialised technology centres).
5. **Strengthening entrepreneurial innovation in the SME sector** through R&D subsidy or tax deduction schemes, support for access to consultancy schemes, innovation management, non-technological innovation support schemes, and also business support services through science/technology parks and incubators.
6. **Industrial and strategic technology** policy focusing on large scale projects in specific industries or technology fields (e.g. environment, transport, medical services, ICT), funding for targeted R&D or demand-driven technology development through public procurement.

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<sup>17</sup> Koschatzky, K., (2009), The uncertainty in regional innovation policy: some ration-ales and tools for learning in policy making, Fraunhofer Institute Working Paper Series, NoR6/2009.

<sup>18</sup> Pro-Inno Europe, Policy measures,

<http://proinno.intrasoft.be/index.cfm?fuseaction=page.display&topicID=262&parentID=52>.

7. **Encouraging technology and knowledge transfer** to enterprises through the creation of technology intermediaries, support for spin-offs, support funding for university-industry cooperation, and student exchange programmes.
8. **Development of innovation poles and clusters** through the funding of sustainable R&D and business networks of firms and research organisations; creation of network/cluster schemes based on partnerships between regional authorities, industry and universities; promotion of international networks. **Creative clusters** promotion also falls under this category.
9. Promote and sustain the creation and growth of innovative enterprises through **financial support instruments** such as grants for technology-based start-ups, public private partnerships and guarantee schemes for venture capital funding.

The description above provides a basis for defining keywords for our literature search to identify articles examining and evaluating existing regional innovation measures and tools.

In practice, of course, the studies that have been conducted could never be expected to fit neatly into any pre-defined schema or typology. A number of studies cut across the various categories, while in certain areas it is difficult to identify any coverage at all. The list will therefore serve merely as a broad guide to the categories that can be used.

## 2.2 Typology of regions

The above list defines an extensive set of measures that local and regional authorities may use to promote innovation-based regional development. However, not all regions are competent to implement such measures. Competence concerns the level of political and financial autonomy enjoyed by each region. Different countries in Europe are characterised by different levels of decentralisation and differing capacities on the part of regional authorities to design, finance and implement their own technology and innovation-based policies. However, access to external resources (e.g. EU or national funds directly allocated to regions or informal initiatives and partnerships) can increase the level of autonomy enjoyed in practice. A number of typologies have been proposed to classify the different degrees of decentralisation and autonomy of regions. We base our typology here – adapted to include the newer Member

States – on work by ESPON<sup>19</sup> <sup>20</sup> identifying four levels of regional autonomy among the 27 EU Member States.

1. Regions in federal states with very high levels of autonomy (regions of Austria, Belgium, Germany, Switzerland, Scotland in the UK) (**Very high level of autonomy**).
2. Regions with elected regional governments with constitutional status, legislative powers and a high degree of autonomy (Italy, Spain, Northern Ireland and Wales in the UK) (**High level**).
3. Regions in decentralised unitary states which have established elected regional authorities with a medium-low level of political autonomy (France, Netherlands, Sweden, Norway, Poland, Slovakia, English regions) (**Medium level**).
4. Centralised unitary states where regions exist for administrative reasons but are subordinate to the central state with no political autonomy (Greece, Denmark, Finland, Ireland, Luxembourg, Portugal, Slovenia, Bulgaria, Romania, Estonia, Cyprus, Czech Republic, Latvia, Lithuania, Malta, Hungary) (**Low level**).

We need to note here that the process of regionalisation and the shifting balance of powers between central and local government is continuously changing the situation on the ground. In addition, in many cases informal processes or mechanisms (partnerships, access to external resources) can give regional authorities greater room for manoeuvre in innovation policy at a practical level. Competence does not necessarily equate with capacity to design and implement innovation policies.

Finally, in addition to differentiation between types of intervention and differences in the extent to which regions are competent to make independent use of them, there are also differences in innovation performance. These can arise for a number of reasons determined by existing regional industrial structure and endowment of natural and institutional resources: notably the higher education facilities that are available, the nature of the regional small firm sector and the traditions and culture of the region. In order to make use of a relatively well-established and authoritative source, we refer to the classification of regional innovative performance proposed in the most recent (2009) Regional Innovation Scoreboard<sup>21</sup>. This divides regions into 5 groups (high, medium-

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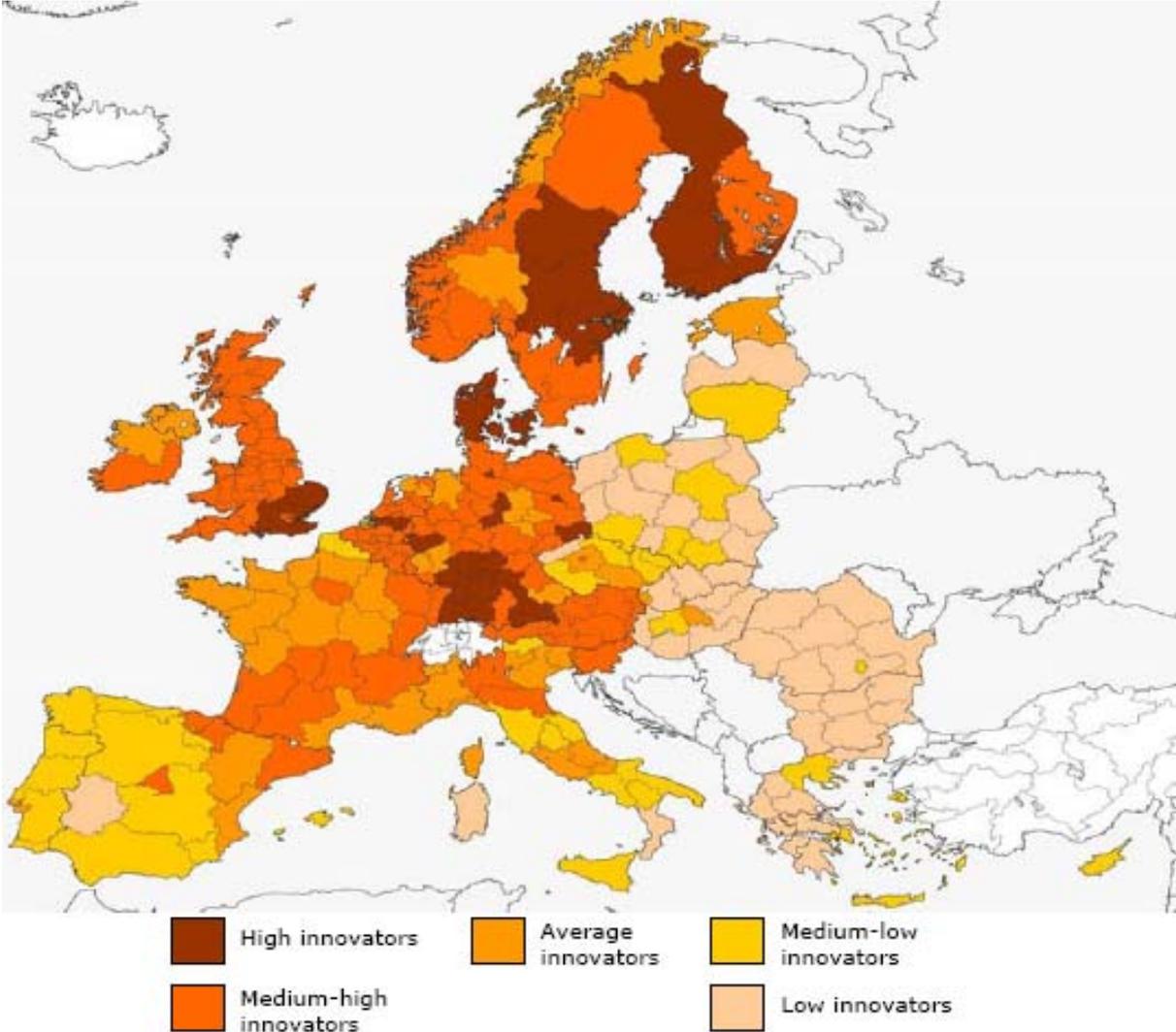
<sup>19</sup>

<sup>20</sup> In the case of new member states the classifications are not as clear cut.

<sup>21</sup> [http://www.proinno-europe.eu/sites/default/files/page/10/03/RIS\\_2009-Regional\\_Innovation\\_Scoreboard.pdf](http://www.proinno-europe.eu/sites/default/files/page/10/03/RIS_2009-Regional_Innovation_Scoreboard.pdf)

high, average, medium-low, low innovators) on the basis of a composite regional innovation index calculated from a set of indicators reflecting innovation determinants (innovation enablers, business activities and output). Figure 1 below presents the resulting map with the 5 innovation performance groups.

**Figure 1 - Regional innovation performance groups**



Source: Regional Innovation Scoreboard (2009)

In our analysis of the literature, these typologies were taken into consideration when reviewing and grouping the different types of interventions to cover all categories of interventions.



## 3. Review of the literature

### 3.1 Methodology for identifying the literature

The review of academic and other relevant literature on innovation undertaken for this briefing focused on the academic and scientific articles identified through extensive, keyword searches in a number of academic databases (ISI Web of Knowledge, Science Direct, Google Scholar)<sup>22</sup>.

The literature search was based on a range of keywords that focused on the main aspects of the issues we aimed to address in the study:

- The types of regional/local innovation strategy, policy, support measures and tools used by local/regional authorities;
- Outcomes: performance in terms of regional achievements and development trajectories;
- The role of regional/local authorities.

For the type of intervention, our approach was to use both general terms such as “regional innovation/technology support” or “regional innovation/technology measures” and more measure-specific keywords searching for evidence on specific types of measure based on the typology described earlier. With regard to outcomes, a similar approach was adopted, moving from generic terms like “regional growth” and “regional performance” to more specific results such as “employment creation”. Terms like “performance”, “evaluation”, and “success” were also used to direct our search. Furthermore, terms like “regional or local authorities/governments” were also included in combination or separately.

From the initial results of each search, articles and book sections were selected on the basis of the information provided in the abstracts. The basic requirement was a reference to empirical evidence in the form of primary or secondary data concerning either individual case studies from regions or empirical studies and comparison of a wider number of cases. Furthermore, the focus was on European cases. Articles focusing solely on the development or review of theoretical models concerning regional innovation, describing innovation measures or comparing different innovation tools without reference to specific tools that had actually been implemented were excluded.

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<sup>22</sup> See description in section 8.

This exercise led to a total of 53 articles. These articles were reviewed with the aim of specifying with greater clarity the type(s) of intervention examined, assessing the degree of information on the type(s) of outcome achieved and classifying them according to the main contextual characteristics (level of technological development; innovation capacity and potential of the region; political and financial autonomy). Furthermore, the review was meant to identify the particular role that the local authorities played in each intervention.

The main conclusion of the review of the existing literature is that there is very little empirical evidence in the academic literature on results, such as GDP growth, employment creation or implications for public finances arising from regional innovation initiatives. The vast majority of the studies focus on:

- a description of policies, the nature of the measures and the tools used;
- whether these are consistent with theoretical models, and
- in a number of studies with a more evaluative focus, the extent to which initiatives achieve the direct aims and objectives of their programmes.

The information from this last category may relate to the impact on direct beneficiaries, such as an increase in innovation-related activity (input and output) and changes in overall performance, such as growth in sales or employment. They also highlight indirect effects, such as increased cooperation and collaboration among regional players (universities, research centres, businesses).

In terms of broader regional development impact, the literature includes studies that attempt to identify development trends or trajectories resulting from regional innovation policies or measures, and those that focus on the role played by regional authorities in the process.

The absence of evidence on the impact of regional innovation policies and tools is largely understandable, in that longer-term results tend to take time to materialise. Given that regionally focused innovation policies have been a rather recent phenomenon, in a large number of cases linked to EU initiatives in the late 1990s and early 2000s, the absence of academic studies providing empirical evidence might be expected. It is also generally recognized that data availability on the relevant variables at a regional or sub-regional level is rather poor. The Regional Innovation Scoreboard for 2009 highlights this problem and calls for data improvements. There are also considerations surrounding the capacity to establish direct connections between specific innovation-based measures and tools and longer term development results in a region. As Fromhold-Eisebith

and Eisebith<sup>23</sup> observe regarding cluster based initiatives, “the improvement of regional economic indicators only counts for evaluation when evidently driven by impulses of the cluster initiative on company and collective performance. This is why neither top-down statistical calculations nor general networking or input–output analyses alone offer convincing methodological solutions”.

## 3.2 Presentation of the literature

Although the literature is more limited than anticipated, this section provides an analysis of the studies identified, grouping them according to the main categories of intervention. The articles or publications identified and analysed are also presented in a table format in Annex 1 of the report, where there is information on the type of instrument examined, the region examined, the role of the regional authority and, if available, the main conclusions concerning any direct or indirect impact. Finally there is a table summarising where evidence is available on different kinds of outcome in relation to the main types of intervention.

A rather important set of publications examining regional innovation measures arose from the EU FP4 SMEPOL project (‘SME policy and the regional dimension of innovation’). These publications were brought together in one edited version by Asheim, Isaksen et al (2003)<sup>24</sup>. The project examined 40 SME-oriented innovation support policies in 11 regions around Europe representing regions with different levels of innovation performance and varying degrees of administrative autonomy. The policies reviewed cover a wide range of interventions relating to SME support measures, from company-oriented support schemes for R&D activities to more systems-oriented schemes, based on technology and knowledge diffusion mechanisms (technology centres, researcher mobility schemes), through to policies aiming to address the weaknesses of the overall innovation system of the region and to change the behaviour or culture of the actors in the region. Furthermore, the policies cover the whole range of interventions in terms of the source of the initiative, including those that are regionally designed and executed; those regionally designed but nationally funded; and those nationally initiated, designed and executed – albeit with adaptations for regional needs and characteristics. The results of the analysis indicated varying levels of success in terms of increasing the level of innovative activity, strengthening the innovative capacity of local businesses or increasing the level of innovation-based cooperation (see table below). The reviewers concluded that there is no one permanent ‘best practice’

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<sup>23</sup> Fromhold-Eisebith, M., Eisebith, G., (2008), Looking Behind Facades: Evaluating Effects of (Automotive) Cluster Promotion, *Regional Studies*, Volume 42, Issue 10 December 2008, pages 1343 – 1356.

<sup>24</sup> Asheim, B., Isaksen, A., Nauwelaers, C., Todtling, F., (2003), Regional innovation policy for small-medium enterprises.

policy or mix of instruments available for each and every situation, but that instruments and policy systems have to be sensitive to context so that they can be adapted to the needs and obstacles of different types of SME in different regional circumstances. A proper sequence and mix of instruments is suggested as being more appropriate than a search for universally and permanently effective tools.

**Table 1 – Regional innovation policy measures for SMEs**

<b>Region (Autonomy/ innovation level)</b>	<b>Programme name</b>	<b>Type of intervention</b>	<b>Regional authority role</b>	<b>Main conclusions concerning long-term effects</b>
Apulia, IT (High Med-Low)	Tecnopolis	Technology centre – services in selected sectors	Only beneficiary National/EU initiation, finance, execution	N/A
Greater London, UK (High Med-High)	London Lee Valley Centres	Technology centres/technology services to firms in focused sectors	Local initiation, execution National/EU finance	Supported technology adoption
Limburg , NL (Medium/ Med-High)	KIM: Knowledge-carriers in industrial SMEs	Researcher mobility	Regional initiation, execution National/EU finance	Induced innovative activity
Limburg , NL (Medium/ Med-High)	KIC: Knowledge-intensive Industrial Clustering	Cluster development support programme	Regional initiation, execution National/EU finance	Limited life of clusters but improvement of participants' innovative capacity. Job creation for some participating firms
Lombardy, IT (High Med-High)	Regional law 35/1996	Finance for innovative projects/processes	Regional initiation, finance, execution	Limited added value
Northern Norway, NO (Medium/ Average)	NT Programme	Financial support for R&D cooperation Advisory services	Only beneficiary National/EU initiation, finance, execution	Supported coordination and cooperation among SMEs and R&D centres Strengthened firms' innovative capacity

<b>Region (Autonomy/ innovation level)</b>	<b>Programme name</b>	<b>Type of intervention</b>	<b>Regional authority role</b>	<b>Main conclusions concerning long-term effects</b>
South-East Norway, NO (Medium Med-High)	RUSH programme	Technology centres supporting university-industry cooperation	Only beneficiary National/EU initiation, finance, execution	Increased R&D activity and product innovation recorded Researcher mobility Support for diversification
Upper Austria, AU (Very high/ Med-High)	Technology Centres	Technology centres	Regional initiation, execution National/EU finance	Limited use of technology services, mainly from large firms. Limited spill over effects
Upper Austria, AU (Very high/ Med-High)	Regional innovation Premium	Finance for innovative projects	Regional initiation, execution National/EU finance	Stimulated cooperation and interaction
Valencia, ES (High/ Average)	Technological Institutes	Technology services for firms	Regional initiation, finance, execution	Strengthened innovation capacity and performance of firms Diffused innovation related information Induced cooperation
Wallonia, BE (Very high Med-High)	Interest free revolving loans	Finance for R&D	Regional initiation, finance, execution	Strengthened innovative capacity
Wallonia, BE (Very high Med-High)	Technology and Innovation Manager	Innovation managers in SMEs – Human resources	Regional initiation, finance, execution	Enhanced approach/invest ment in innovation

Source: Asheim et al. (2003)

There are some limitations to this analysis. It concentrates on measures as its main focus and rarely goes beyond the assessment of the direct results and impact on SMEs to assess broader and longer term regional development impact. At best, what it provides is an assessment of the extent to which projects help to strengthen aspects of the innovation system of the region and provide opportunities for a new development trajectory. But there is still no reference to the overall impact on the region. Furthermore, the involvement of regional/local authorities in the projects is not closely examined, so it is not possible to draw conclusions on their role and contribution.

### **3.3 Innovation strategy development**

This role is more closely examined in the series of articles published in the book edited by Morgan and Nauwalears (2003) examining the formulation and implementation of a number of the Regional Technology Plans (RTP), Regional Innovation Strategies (RIS) and Regional Innovation Technology Transfer Strategies (RITTS) – all EU initiatives implemented during the 1990s. The regions concerned were less-favoured regions<sup>25</sup> with weak innovation systems. The concept of RISs, RTPs and RITTSs was initiated at EU level and was based on the idea of moving away from physical infrastructure to strengthening the organisational base and encouraging co-operation. These policies were promoted by the EU but were implemented at regional level. They are developments that can be put in the category of aiming to improve innovation governance and strategic intelligence for policy making.

However, once more, the articles in the book do not provide any detailed analysis of the policies' impact in terms of regional development. The focus of the evaluation was on the process involved in developing strategies and the role of the various players. In addition, it would have been difficult to measure most of the anticipated results at the time. However, there was some consideration of the role of regional authorities in the final chapter of the book. In almost all cases, the role of the region is seen as one of initiating the process, stimulating and organising the dialogue between partners to develop the strategy. The study concludes that in the case of regions with a high level of political autonomy (like Castilla y Leon in Spain), the leading role of the regional authorities is fundamental – since without their presence and backing the dialogue lacks credibility. Furthermore, they can usually go beyond organising dialogue to creating new infrastructure and instruments to implement the strategies. In other regions, the backing and commitment of the regional authorities is still

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<sup>25</sup> Wales (UK), Limburg (NL), Central Macedonia (GR), Castilla y Leon (ES), Southern Brandenburg (DE), Lorraine (FR).

necessary even if the role of coordination is delegated to a project champion (individual, company, another institution).

### 3.4 Exploiting universities' knowledge base

While not explicitly appearing under one of the intervention typologies, exploitation of the knowledge base of universities as a tool for regional development is given particular focus in the relevant literature<sup>26</sup>. The transformation of universities into what is called an “entrepreneurial university” (Etzkowitz, 2004)<sup>27</sup> is examined in a number of studies. Generally, researchers refer to the capacity of universities to draw on their wider networks to shape the development of regional institutions and create connections within the regional innovation systems that have a long-lasting regional impact. Most of the studies identified during our review focused on the internal processes of the universities and the way they gradually become more involved in regional development, but a number of them referred also to the role that regional authorities and their policies have played in initiating this process (Coenen,2007; Kitagawa, 2004; Benneworth, P., Charles, D.,2005). This may be active support through creation of infrastructure (incubators, science parks) and provision of financial support, or it may be indirect support through development of partnership schemes to make them more relevant to the needs of the region. Benneworth and Arbo (n.a.)<sup>28</sup> suggest that if universities and local/regional authorities can find a way to work together in a complementary way, then they can produce a global/local knowledge economy representing an improvement in the economic situation of the wider territory.

Coenen (2007)<sup>29</sup> examined the North East region in the UK and Scania in Sweden. In both regions local policy makers realised that universities are important and useful generators of knowledge, and that their policy can influence how that knowledge base is exploited to promote regional development. In both cases, again, the focus was on activities to promote public and private sector cooperation to embed academic knowledge in particular commercial applications. In the North East of England – a region suffering from industrial decline and with limited, albeit increasing, political autonomy – the regional authorities initially supported this cooperation through the

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<sup>26</sup> For a discussion and different issues raised see Charles, David(2006) 'Universities as key knowledge infrastructures in regional innovation systems', *Innovation: The European Journal of Social Science Research*, 19: 1, 117 — 130.

<sup>27</sup> Etzkowitz, H.,(2004), The evolution of the entrepreneurial university, *International Journal of Technology and Globalisation*, 1(1): 64-77.

<sup>28</sup> <http://www.oecd.org/dataoecd/55/7/37006775.pdf>.

<sup>29</sup> Coenen L, 2007, "The role of universities in the regional innovation systems of the North East of England and Scania, Sweden: providing missing links?" *Environment and Planning C: Government and Policy*, 25:6, 803 – 821.

establishment of intermediary university-industry agencies. The formulation of a Strategy for Change aimed to promote structural change and included the establishment of five research “Centres of Excellence” building on existing academic strengths. It also involved setting up a venture capital fund to support spin-offs from the university. The strategy was further promoted by setting up a regional development agency to serve as coordinator in the region. The results suggest that the region has successfully helped the university to become more entrepreneurial and gradually encouraged the emergence of a small biotech cluster, allowing the institution to reposition itself as the “place to do science”. As reported by Benneworth and Charles (2005)<sup>30</sup> in an earlier study, the number of spin-offs created is still relatively small, but the fund has increased the amount of venture capital invested and helped to strengthen links between universities and companies.

In comparison, in the case of the Scania region, the regional authorities focused on revitalising the food sector, a sector with a much greater weight in the regional economy than the already well developed ICT and biotech sectors that had already developed into clusters of global importance. The Scania Food Innovation Network, a pre-existing regional network of the business and scientific communities and regional politicians, exploited the opportunity provided by the national VINNVAXT programme to increase the added value of the food industry by exploiting the knowledge base of the University of Lund. A number of targeted technology development areas were supported, co-funded by the regional and the national authorities, and established on the basis of a regional growth agreement the central government, in parallel with a research commercialisation scheme. The author concludes that in this case, where a knowledge-generation system is already well established, the role of the regional authorities was to help forge the necessary links with the isolated and more traditional food industry. However, the author does not provide any evidence of success and the impact on the region “remains to be seen”.

A third example of a university-based regional development strategy was that of Twente in the Netherlands. In many respects Twente has a similar profile to the North East Region and is characterized by the dominance of a declining textiles industry. A study by Benneworth et al. (2006)<sup>31</sup> suggests that it was the university itself that took the first steps to promote a post-textiles strategy for the region based on the exploitation of knowledge, through a large number of spin-off firms and the attraction of foreign firms in the materials, mechanics and

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<sup>30</sup> Benneworth, P., Charles, D.,(2005), 'University spin-off policies and economic development in Less successful regions: Learning from two decades of policy practice', *European Planning Studies*, 13: 4, 537 — 557.

<sup>31</sup> Benneworth, P., Hospers, G-J., Jongbloed, B., (2006), *New Economic Impulses in Old Industrial Regions: The Case of the University of Twente*, paper presented to the “Dutch-German Applied Economics Annual Seminar” the Rothenberge Estate, the University of Muenster, Germany, 8th-9th December 2006-03-31, <http://www.staff.ncl.ac.uk/p.s.benneworth/rothenberge.pdf>.

medical sciences. Local and regional authorities gradually realised the potential role of the university as a regional asset and supported it through a number of projects including the development of a technology centre, an incubation centre and a seed fund, and are promoting the development of a “knowledge district”. They report that Twente has succeeded in gradually moving towards a modern technopole, with more than twice the national average of R&D expenditure, but also suggest that the whole process is still rather limited and disconnected from large parts of the local economy that remain in low tech sectors.

Finally, according to (Kitagawa, 2004)<sup>32</sup>, the North East region has not been the only region in the UK seeking to exploit the knowledge base of universities. “Regional Science/Research Councils” in a number of English regions are mechanisms used to implement a wider strategic regional networking process involving universities as the main players. The initiative has been at national level but is implemented at regional level with the regional development agencies actively involved – albeit at different levels – through provision of funding for a number of research collaboration and knowledge exploitation projects. However, the study does not provide any evidence of the impact of this strategy on the regions.

Based on a different approach of strengthening the institutional base, Kitagawa(2009)<sup>33</sup> refers to “Research Pooling Initiatives” by the regional government in Scotland. Research pooling is based on joint long term R&D programmes among the regional universities in different scientific sectors aiming to strengthen the knowledge base and visibility of universities and to attract more students and researchers. The researchers do not provide evidence of regional impact beyond an increase in R&D activity, but it is reported that there is an increase in the number of international students and leading scientists in the region.

### **3.5 Technology centres**

Technology and innovation centres provide specialised services to SMEs in the form of either support for new technology development or, more often, support for the adoption of existing technologies and innovation. A few such examples, including the technology centres in Valencia, Spain and Upper Austria, were already presented in the SMEPOL study, where there were differing conclusions concerning their support role to SMEs (see Table 2 below).

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<sup>32</sup> Kitagawa, Fumi(2004) 'Universities and regional advantage: higher education and innovation policies in English regions', *European Planning Studies*, 12: 6, 835 — 852.

<sup>33</sup> Kitagawa, Fumi(2009) 'Creating Critical Mass of Research Excellence in the Region: The Case of Scottish Research Pooling Initiatives', *European Planning Studies*, 17: 3, 487 — 495.

**Table 2 – Technology centres’ initiatives (SMEPOL study)**

<b>Region (Autonomy/ innovation level)</b>	<b>Programme name</b>	<b>Type of intervention</b>	<b>Regional authority role</b>	<b>Main conclusions concerning long-term effects</b>
Upper Austria, AU (Very high/ Med-High)	Technology Centres	Technology centres	Regional initiation, execution National/EU finance	Limited use of technology services, mainly by large firms. Limited spillover effects
South-East Norway, NO (Medium Med-High)	RUSH programme	Technology centres supporting university-industry cooperation	Only beneficiary National/EU initiation, finance, execution	Increased R&D activity and product innovation recorded Researcher mobility Support for diversification
Apulia, IT (High Med-Low)	Tecnopolis	Technology centre – services in selected sectors	Only beneficiary National/EU initiation, finance, execution	N/A
Greater London, UK (High Med-High)	London Lee Valley Centres	Technology centres/technology services for firms in targeted sectors	Local initiation, execution National/EU finance	Supported technology adoption
Valencia, ES (High/ Average)	Technological Institutes	Technology services for firms	Regional initiation, finance, execution	Strengthened innovation capacity and performance of firms Diffused innovation-related information Induced cooperation

In addition, a study by Diaz-Puente, Cazorla et al. (2009)<sup>34</sup> examined the contribution of Technology Diffusion Centres created by the regional government of Madrid to promoting an innovation culture and developing the capacity of SMEs in the Madrid region. The scheme was initiated and funded by the regional government and was implemented through various agents providing technology support services, including business associations, local authorities and universities. The assessment of the scheme revealed a significant

<sup>34</sup> Diaz-Puente, J., Cazorla, A., De los Rios, I., (2009), Policy Support for the Diffusion of Innovation among SMEs: An Evaluation Study in the Spanish Region of Madrid", *European planning studies*, 17 :3, 365-387.

contribution in the form of increased awareness of the importance of innovation in most of the firms, and an increase in associated investment.<sup>35</sup>

### 3.6 Financial instruments

There is a wide range of types of financial instrument used. The SMEPOL study presented earlier (see table below concerning financial tools) identified a number of financial instruments and programmes designed or implemented at regional level focusing on support through grants, innovative activities or R&D cooperation. The role of regional authorities ranged from that of initiator, as in the case of Lombardy or Wallonia, to simply beneficiary or participant in a national or EU-initiated scheme.

**Table 3 - Innovation finance tools (SMEPOL study)**

Region (Autonomy/ innovation level)	Programme name	Type of intervention	Regional authority role	Main conclusions concerning long-term effects
Lombardy, IT (High Med-High)	Regional law 35/1996	Finance for innovative projects/processes	Regional initiation, finance, execution	Limited added value
Northern Norway, NO (Medium/Average)	NT Programme	Financial support for R&D cooperation Advisory services	Only beneficiary National/EU initiation, Finance, execution	Supported coordination and cooperation among SMEs and R&D centres Strengthened firms' innovative capacity
Upper Austria, AU (Very high/Med-High)	Regional innovation Premium	Finance for innovative projects	Regional initiation, execution National/EU finance	Stimulated cooperation and interaction
Wallonia, BE (Very high Med-High)	Interest free revolving loans	Finance for R&D	Regional initiation, finance, execution	Strengthened innovative capacity

Source: Asheim et al.,2003

<sup>35</sup> Another study of a technology centre is that of the B2B Manufacturing Centre (B2B-MC) established in the North East, UK. Its objective aimed to help SMEs adopt internet technologies in order to improve manufacturing, logistics and other marketing activities. However, we did not have access to the study to identify the impact on the firms' performance and the region.

Risk capital programmes (seed funds, angel investing) have also been developed in a number of regions and it is suggested that regional risk capital programmes are more efficient because geographic proximity is important in the early stages of the relationship between investor and recipient (Aernoudt, 1999)<sup>36</sup>. The literature suggests that there have been a number of schemes involving risk capital support, but very few data are available and there is limited evidence of their impact (Mason, 2009)<sup>37</sup>.

Our research identified one study from a business angel support programme. Collewaert and Manigart (2010) evaluated the Business Angels Network (BANs) scheme that was developed and subsidised by the regional government of Flanders in Belgium. The evaluation of the programme compared companies that received support with non-BA-backed companies and indicated positive effects in the performance of the individual firms, but rather limited contributions to the broader region in terms of value added and job creation. More positive was the firms' increased capacity to attract additional innovation finance.

### **3.7 Science parks and incubators**

Science and technology parks, and especially incubators, have been widely used in the last 20 years or so across Europe. By 1998 there were already 315 science parks in 15 Western European countries (Storey and Tether, 1998)<sup>38</sup> and this trend has continued in the subsequent period (IASP,2008)<sup>39</sup>. In a large number of cases in many countries, regional and local authorities have been involved. Even in cases where they have been absent from the design and implementation of such instruments they are nearly always involved in funding infrastructure. Incubators and science parks tend to bring together different categories of intervention presented in section 3.1. They combine company-based support through provision of facilities, finance and business and technology services for innovative SMEs or academic spin-offs, with the more systemic element of R&D cooperation and collaboration, researcher exchange, networking among various regional players and, more long term, the development of technology clusters.

In response to the popularity of science parks and incubators, a number of researchers have attempted to assess their success. However, as in relation to the

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<sup>36</sup> Aernoudt, R., (1999), European policy towards venture capital: Myth or reality?, *Venture Capital* ,1:1, 47-57.

<sup>37</sup> Mason, C.,(2009), Public Policy Support for the Informal Venture Capital Market in Europe, *International Small Business Journal* , 27:(5), 536-55.

<sup>38</sup> Storey, D. J. and Tether, B. S., (1998), Public policy measures to support new technology based firms in the European Union, *Research Policy*, 26: 9,1037-1057.

<sup>39</sup> IASP, (2008), *The IASP at a glance - Facts and Figures* [online], International Association of Science Parks, Retrieved on 10/04/2008 from [www.iasp.ws](http://www.iasp.ws).

previous measures, the focus tends to be on the direct impact on beneficiaries and development of co-operation with universities and other entities. Again, there is very little evidence of the broader impact on the regions where they are located and their development<sup>40</sup>.

One such study concerns the Technopolis of Oulu in Finland and the Mjärdevi Science Park in Linköping, Sweden (Cooke, 2001)<sup>41</sup>. It concludes that they have both made a positive contribution to the regional economy in the form of an increased number of start-ups and spin-offs inside and outside the two parks, and in terms of supply chain linkages between local firms and a couple of large companies (Nokia and Ericsson). Both parks were initiated by universities and the authors do not provide information on the role of regional authorities.

A number of studies have focused on the role of science parks and technology incubators in Sweden (Löfsten and Lindelöf, 2002; 2003; 2005, Lindelöf and Löfsten, 2004; 2006; Ferguson & Olofsson, (2004), Dahlstrand and Klofsten (2002))<sup>42</sup>. They all examined companies in a group of science parks, but focused on the park tenants' performance and the development of links with local universities, and not on the broader impact on the economy. The results they presented are generally positive, but again we have little information on the role and contribution of regional authorities. A similar study of a group of parks and business incubators in Italy (Colombo and Delmastro 2002)<sup>43</sup> indicated even more positive results in terms of tenants' performance, but also does not say much about their contribution to regional growth. Outside Europe, a few articles provide more direct answers on the contribution of parks and incubators to regional development. They are based on a comparison of the evolution of

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<sup>40</sup> A few extensively cited studies concerning the contribution of Science and Technology parks in regional development are those of Massey(1992) and Monck et al (1988) in the UK and of Goldstein and Luger (1991) in the US.

<sup>41</sup> Cooke, P., (2001), From technopoles to regional innovation systems: the evolution of localised technology development policy, *Canadian journal of regional science*, 24(1): 21-40.

<sup>42</sup> Lindelöf, P. and Löfsten, H., (2004), Proximity as a resource base for competitive advantage: University-Industry links for technology transfer, *Journal of technology transfer*, 29: 3-4,311-326.

Lindelöf, P. and Löfsten, H., (2006), Science park effects in Sweden: dimensions critical for firm growth, *International journal of public policy*, 1:4,: 451-474.

Löfsten, H. and Lindelof, P., (2005), R&D networks and product innovation patterns—academic and non-academic new technology-based firms on Science Parks, *Technovation*, 25:9, 1025-1037.

Löfsten, H. and Lindelöf, P., (2002), Science Parks and the growth of new technology-based firms--academic-industry links, innovation and markets, *Research Policy*, 31:6, 859-876.

Löfsten, H. and Lindelöf, P., (2003), Determinants of the entrepreneurial milieu: Science parks and business policy in growing firms, *Technovation*, 23:51-64.

Ferguson, R. and Olofsson, C., (2004), Science parks and the development of NTBFs - Location, survival and growth, *Journal of technology transfer*, 29:5-17.

Dahlstrand, A. L. and Klofsten, M., (2002), Growth and innovation support in Swedish Science Parks and Incubators, in Oakey, R., During, W. and Kauser, S.(eds), *New technology based firms in the new millennium*, Elsevier Science, Oxford.

<sup>43</sup> Colombo, M. and Delmastro, M., (2002), How effective are technology incubators? Evidence from Italy, *Research Policy*, 31:7, 1103-1122.

regions in two groups: those with parks established and those without. Shearmur and Doloreux (2000)<sup>44</sup> in Canada and Wallsten (2004)<sup>45</sup> in the US both found limited or no contribution to high tech job creation in regions with science park establishments when compared with other regions without such initiatives. The conclusion of the studies cited is that parks do not contribute to regional technology development.

As stated earlier, specialised or thematic incubators are commonly used to support cluster strategies. One such example is provided by Swartz and Hornyh (2008)<sup>46</sup> for the city of Halle in the region of Saxony-Anhalt, East Germany. A region of heavy industry before re-unification, it experienced strong decline and unemployment in the subsequent period. The establishment of the sound broadcasting division of a regional broadcast service in 1998, was the starting point for a number of initiatives that the local authorities initiated and financed to develop the media industry in Halle. These included subsidies for relocation of firms. However, despite the increase in the number of firms and jobs, development remained limited and the companies focused on the low tech segments of the sector. In order to address that, in 2003 the local authorities created a multimedia incubation centre to host and support knowledge-intensive multimedia firms and to promote the city as well as the entire region as a nationwide competence centre for the media economy. The researchers' evaluation indicates that the incubator did bring benefits to the beneficiaries but could not provide evidence of a broader regional impact besides the image boosting effect for the firms and the region.

Overall, while the STP and incubators phenomenon is rather widespread there is still only limited evidence on their contribution to regional development, although there seems to be a consensus that they have a positive role in supporting the performance of SMEs and start-ups and, to a certain extent, in supporting and strengthening the linkages between firms and universities, thereby contributing to the development of the regional innovation system. However, by themselves, at least, parks and incubators are not starting points for cluster development.

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<sup>44</sup> Doloreux, D., (2002), What we should know about regional systems of innovation, *Technology in Society*, 24:3, 243-263.

<sup>45</sup> Wallsten, S., (2004), The role of government in regional technology development: the effects of public venture capital and science parks, in *Bresnahan, T. and Gambardella, A.(eds), Building high-tech clusters - Silicon Valley and beyond*, Cambridge university press, Cambridge.

<sup>46</sup> Specialization as strategy for business incubators: An assessment of the Central German Multimedia Center

### 3.8 Cluster promotion strategies

Cluster formation and development programmes have recently become a very commonly used policy for regional development. Porter's(1990)<sup>47</sup> cluster model – which initially did not have a specific spatial reference – has been implemented and promoted worldwide. The relevant academic literature is substantial and typically examines either the processes and mechanisms that supported the creation of the cluster, or the extent to which a cluster, as described in theory, really exists, and whether the dynamics and mechanisms of growth are present.

Initiatives promoting cluster development usually combine measures that involve the engaging relevant players, collective technology development schemes, business and innovation services and links, and the promotion of collaborative research and commercialisation through spin-off finance.

A recent OECD publication<sup>48</sup> reviewed 19 cluster support programmes from 8 European countries, although in only one case (the Basque Country, Spain) were regional authorities the initiators of the cluster. Even in countries with a high level of regional autonomy like Germany, the initiative came from the national level. The regional authorities participated more or less actively through the provision of co-funding and assistance in implementing the programmes as part of a regional innovation strategy. However, in only 4 cases was information reported on the performance of the clusters, and this concerned the total number of clusters. In general, it indicated positive outcomes in terms of job creation or boosted R&D activity.

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<sup>47</sup> Porter, M., (1990) *The Competitive Advantages of Nations*. Macmillan, London.

<sup>48</sup> OECD(2007), *Competitive Regional Clusters – National Policy Approaches*

**Table 4 – Examples of cluster support programmes in EU countries – Role of regional authorities and impact**

Country	Programme	Role of regional government(s)	Focus	Main results reported
FR	Local Production Systems (SPL)	Organise application Co-fund and coordinate	Engage actors Networking Fund joint activities	Employment growth 9% versus 5.7% in equivalent sectors with no SPLs
DE	BioRegio (4 advanced high-tech regions)	Organise application Co-fund and coordinate/ implement	Strengthen existing biotechnology clusters Finance/R&D collaboration/Networking-Coordination /Business support	Total in 4 regions: >300% increase in the number of biotech companies >9 000 jobs Regions: Higher than national average increase in biotech jobs
DE	InnoRegio (Lagging regions in East Germany)	Organise application Co-fund and coordinate/ implement	Strengthen existing biotechnology clusters Finance/R&D collaboration/Networking-Coordination /Business support	Higher level of R&D activity than East Germany average
ES	Basque country Competitive ness programme	Initiate, finance, coordinate	Engage actors Develop cluster strategy Networking	Public/private collaboration, strategic cluster orientation. Creation of various export consortia and technology projects.

Source: OECD report on clusters

Other studies identified provided more information on the results – and some detail on impact – of individual cluster development cases and of the role of regional authorities. Mattsson(2009)<sup>49</sup> examined the Biotechvalley cluster initiative in Strangnas, Sweden (region of Malardalsregionen). This cluster initiative developed in a region with a substantial pre-existing pharmaceuticals sector. Since the creation of the cluster, a large number of companies have joined the cluster and a number of high-profile companies have been drawn to the region.

<sup>49</sup> Mattsson, H.,(2009), Innovating in Cluster/Cluster as Innovation: The Case of the Biotechvalley Cluster Initiative, *European Planning Studies*, 1469-5944, 17: 11, 1625 – 1643.

In a study of the BioRegio programme of the German government referred to above, Kaiser (2003)<sup>50</sup> assessed the contribution of Bavaria's regional government to the development of a global pharmaceuticals cluster. Bavaria is a region with a high level of political and financial autonomy and it belongs to the group of the most advanced high income industrial leaders in Europe. The selection of Bavaria as one of the four regions to be awarded BioRegio funding was on the basis of the strong existing knowledge and technological base (R&D centres, pharmaceutical firms). However, the regional government of Bavaria also played a critical role by helping to exploit this potential through the creation of a networking and coordination structure for the initiative in the form of a publicly initiated public-private partnership (BioM AG). In addition, it provided the necessary finance in the form of venture capital and R&D collaboration support. The Bavarian biotech cluster is currently Germany's strongest, attracting the highest level of VC, and is developing into an important cluster globally. However, the biotechnology sector is not the only sector that the Bavarian government supported through the promotion of cluster development. The High-Tech Offensive programme launched in 1999 was a €1.35 billion initiative to develop clusters in life sciences, information and communication technology, new materials, environmental technologies, and mechatronics. The study of Flack et al. (2010) is one of the few that examines the actual effects of such a programme. It found that the programme increased the likelihood of innovation by a firm in the target industry by 4.6 to 5.7%. The researchers also found an increased opportunity for access to external know-how, cooperation with public scientific institutes, and access to suitable R&D personnel. They estimate that the programme yielded around €3.3 billion in additional sales.

In the region of Flanders (BE), the business angels network scheme presented earlier was just one example of a measure supporting innovation adopted by the Flemish authorities. According to Benneworth (2007)<sup>51</sup>, the role of this regional government has been critical in facilitating innovation-based development since the early 1980s. A report entitled *Third Industrial Revolution Flanders* (TIRF) served as the starting point for development of cluster-based policies in a number of high technology areas throughout the 1990s. Flanders Language Valley and Flanders Multimedia Valley were two of the cluster support organisations created during the 1990s with the support of the regional government<sup>52</sup>. The report refers to a significant increase in the number of ICT related firms and related employment in the region in the period 1992-1999, part of which could be attributed to the cluster policy.

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<sup>50</sup> Kaiser, R.,(2003), Multi-level Science Policy and Regional Innovation: The Case of the Munich Cluster for Pharmaceutical Biotechnology, *European Planning Studies*, 11: 7.

<sup>51</sup> Benneworth,P., (2007), Leading Innovation – Building effective regional coalitions for innovation, NESTA Research report.

<sup>52</sup> OECD (2001), Innovative clusters – Drivers of national innovation systems.

Rutten and Boekema (2007)<sup>53</sup> examined the Stimulus Cluster Scheme in the high income and technologically developed region of Eindhoven in the Netherlands. The scheme supported over 100 clusters of SMEs in a range of sectors and the results reported were increased technological sophistication of the region's companies and the development of new products and processes. The authors suggest that the strengthening of co-operation and the development of social capital had a positive role in the success of the firms and the change in the region's performance, but they fall short of providing information on the role of the regional authorities other than in the design of the Stimulus programme.

Taylor and Raines (2001)<sup>54</sup> focus more on this area when examining cluster development projects in Scotland and the Basque country, regions enjoying a significant level of political and financial autonomy. They suggest that in both regions the regional governments served as the initiators and organisers of cluster formation by defining the targeted sectors and providing funding, but that they largely left the management role of the clusters to the private sector (although at different levels). The authors do not provide information on the impact in terms of development of cluster programmes still in their initial phases. They do refer, however, to the gradual development of an informal community and the strengthening of interaction among participants. At the same time, they suggest that in both cases the clusters' capacity to sustain themselves remains to be seen.

### **3.9 Sector-based development**

As discussed, a number of studies examine strategies focused on promoting particular sectors. These often relate to sectors seen as having significant growth potential and include ICT and bio-technology and life sciences. Although, as was seen in the case of the North East of England, promotion of these sectors can start from a relatively low base, they are still often characterised as knowledge-intensive industries and rely on a strong base in regional institutions of higher education or research centres.

A high-growth industry that does not fit into quite the same category, but which is also the focus of a distinct sectoral strategy adopted in many regions and localities, is the creative sector. This is a sector that covers distinctive activities - from those based on culture and heritage through to various forms of software

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<sup>53</sup> Rutten, R., Boekema, F.,(2007), Regional social capital: Embeddedness, innovation networks and regional economic development, *Technological Forecasting and Social Change*, 74:9, 1834-1846.

<sup>54</sup> Taylor, S., Raines, P.,(2001), Learning To Let Go: The Role of the Public Sector in Cluster Building in the Basque Country and Scotland, *European Policy Research Centre papers*, No 48, 2001, [http://www.eprc.strath.ac.uk/eprc/publications\\_eprp.cfm](http://www.eprc.strath.ac.uk/eprc/publications_eprp.cfm).

development and to architecture, advertising and media. The common factor is identified in its definition as ‘those industries which have their origin in individual creativity, skill and talent ...’<sup>55</sup> and in this sense it is a key element in the knowledge economy. However, given the wide skills base that it can draw on and the variety of cultural and heritage assets across Europe, this sector does not rely in the same way on concentrations of highly specialised knowledge, and is applicable in regions and localities at very different stages of development.

Furthermore, promotion of the creative sector can take a large variety of forms, and aspects of this promotion can have significant spill-over effects. The development of iconic buildings associated with cultural activities and the refurbishment of heritage sites can have wide-reaching effects on attitudes and perceptions and on the branding and marketing of regions and localities. However, as a forthcoming study on culture in local and regional development<sup>56</sup>, undertaken by CSES for DG EAC in the European Commission shows, culture-based interventions and broader strategies to develop the creative sector can take many different forms. There are now many forms of culture-based intervention, from applications in developing creative skills, through dedicated incubators to the promotion of creative districts or clusters.

Again, there is relatively little assessment of the impact of creative initiatives and strategies. However, a study on the effects of a series of interventions supported by the Structural Funds in Cornwall in the South West of England<sup>57</sup> showed some striking results. These included 29% turnover growth in the creative sector between 2000 and 2004, growth in Gross Value Added of 34%, compared with 7% nationally, an increase in employment of 19% and an increase in the number of businesses by 23%.

### **3.10 Impact Summary**

The table below summarises the studies referring to some sort of impact that were included in the review. Reference to different types of intervention are ranged against different types of impact. The numbers refer to articles set out in Annex 1.

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<sup>55</sup> UK Department of Culture, Media and Sport (2001), ‘Creative Industries Mapping Document 2001’ (2 ed.)

<sup>56</sup> CSES, ‘The Contribution of Culture to Local and Regional Development - Evidence from the Structural Funds’, forthcoming

<sup>57</sup> Twomlow, J., Brownridge, K., (2007), ‘Counting on Creativity’ Perfect Moment.

## Summary Overview of Interventions & Impacts

Measures	Innovation governance and strategic intelligence	Foster an innovation friendly environment	Higher education and human capital development	Develop research infrastructure in universities and research centres	Strengthen entrepreneurial innovation in the SME sector	Industrial and strategic technology policy	Encourage technology and knowledge transfer	Development of innovation poles and clusters	Innovation finance instruments
<b>Outcome related impacts</b>									
Strengthen innovation cooperation					29		40	1,4,10,16,17,19	25
Develop common innovation strategy	45								
Informal community developed	45							1	
Increase R&D activity					30,31,34		42	9,22	
Increase innovation output (new/improved products, processes)					32,34,35		41	13,14,17,18	24,27
Change of attitude towards innovation					29				
Upgrade existing low technology/non-competitive sectors				19,21					
Support knowledge base – internationally recognised cluster								2,12,22	

Measures  Outcome	Innovation governance and strategic intelligence	Foster an innovation friendly environment	Higher education and human capital development	Develop research infrastructure in universities and research centres	Strengthen entrepreneurial innovation in the SME sector	Industrial and strategic technology policy	Encourage technology and knowledge transfer	Development of innovation poles and clusters	Innovation finance instruments
<b>Longer term regional development impacts</b>									
Attract firms and additional capital from outside							42	2,14	
Improve firm performance and productivity					44			4,5,21, 26,51	26
Employment creation								5,7,8,26, 51	24,26
New firms created								8,51	
Improve image of region					44			51	

## **3.11 Policy conclusions**

Although it cannot be claimed that the evidence considered gives clear indications of the most effective innovation strategies to follow at a local or regional level, it is possible to identify recurring themes that point to elements in a coherent strategy framework. One of the advantages of constructing such a framework is that the key structural features are mainly at such a level of generality that they can readily be applied to the very different circumstances faced by the variety of regions and localities across Europe. This variety, as we have seen, encompasses differing overall income and development levels, differing current innovation performance, differing scale and differing policy competences.

Furthermore, any innovation strategy will develop over time, not least building on earlier successes and an analytical framework that has to allow for this evolution. Finally, any general framework has to be flexible enough to allow the detail of initiatives to differ in significant ways from that pursued by other regions. Developing competitive advantage implies identifying lines of development that differentiate an area or region from others. There is no point in everyone pursuing exactly the same strategy. The suggested framework therefore has to be considered as an analytical structure containing a series of policy options.

The following sections set out a framework that incorporates most of the elements referred to in the various literature, but puts them in a sequence of developments seen as taking place over time. Central to the proposed structure is the perception that because of their proximity to the environment in which innovative activity actually takes place, regional and local authorities have a prime role in promoting innovation.

The framework strategy consists of five elements:

### **3.11.1 Policy leadership**

Economic development can happen organically, but is likely to be more successful if it takes place within a clear policy framework that is well communicated and supported by all the main stakeholders. Regions and local authorities will have differing degrees of freedom within which they can operate.

Successful innovation strategies, however, require a degree of focus. Regions and localities need to decide where their strengths lie and then play to them. An examination of relative competitive advantage is central to developing this focus

<i>Policy leadership</i>
Political will to develop an innovation strategy Corresponding organisational structure Strategic Planning <ul style="list-style-type: none"> <li>- Review of existing competitive advantages</li> <li>- Flexible framework of objectives</li> <li>- Identification of policy priorities</li> <li>- Identification and commitment of resources</li> <li>- (Land use) planning clearance</li> </ul> Articulating links with other aspects of regional strategy Communication, advocacy and confidence building Establishing base for evaluation and impact assessment Review & adaptation

### **3.11.2 Creating the foundation**

Implementing the strategy decided upon in the first phase requires specific measures to provide the right environment for innovative enterprises to flourish. This may include developing infrastructure, promoting networking and developing skills of different kinds.

Special attention should be paid to the research base necessary to realise any sectoral ambitions.

There should also be initiatives to ensure that the public authorities' own regulations and administrative procedures are conducive to SME development.

<i>Creating the foundation</i>
Deciding on implementation targets Inspiring confidence Infrastructure investment <ul style="list-style-type: none"> <li>- Business support facilities – advice centres, incubators etc</li> <li>- Other infrastructure – research facilities etc</li> </ul> Establishing networks <ul style="list-style-type: none"> <li>- Business networks</li> <li>- Networks with universities and research institutions</li> </ul> Skills development <ul style="list-style-type: none"> <li>- Organisational</li> <li>- Applied</li> </ul> Reviewing and simplifying regulation and administrative procedures

**3.11.3 Sound development**

Initial developments need to be systematically followed up, building on advantages developed in earlier phases.

Of particular importance at this stage are mechanisms to ensure that SMEs are aware of and responding to the opportunities created by the previous phase.

An understanding of the dynamics of local cluster development and implementation of measures to further foster these processes are crucial.

Success on a smaller scale and appropriate lobbying can lead to inward investment or location of larger scale projects in the region or locality.

<i>Sound development</i>
Identifying and highlighting opportunities arising from ‘foundation’ developments
Identifying and strengthening synergies in target sectors
Promoting emerging competitive advantages
Focusing resources in order to strengthen SME innovation including:
- Fine-tuning of existing measures and programmes
- New initiatives
Creating opportunities by:
- Promoting cluster development
- Encouraging networking
- Facilitating information exchange
Highlighting success
Promoting large-scale projects
Establishing metrics and data collection for assessing impact

**3.11.4 Proper support**

Proper support for enterprises is critical, especially if they are to be ambitious in their growth plans. Ensuring access to appropriate funding is a major part of this provision.

This support has to be at an individual level and also at the more strategic level. At the strategic level, intelligence about cluster developments, for instance, needs to be fed back to the community and acted upon.

<i>Proper support</i>
<p>Provide or establish links with support for innovative activity:</p> <ul style="list-style-type: none"> <li>- Where appropriate, arrange promotional events</li> <li>- Provide industry briefings</li> <li>- Facilitate contacts with others active in industry</li> </ul> <p>Provide or reinforce links with critical business support mechanisms:</p> <ul style="list-style-type: none"> <li>- Enterprise support</li> <li>- Specialised innovation support</li> <li>- Access to finance</li> <li>- Intellectual property management</li> <li>- Education &amp; training</li> </ul> <p>Policy feedback mechanisms</p>

### **3.11.5 Flying high**

Once take-off has been achieved, it is important to keep the situation under review, especially by conducting formal evaluations, and to head off any tendency for the successful development to lose dynamism.

Further development can be achieved by extending the success across regional and national boundaries.

Continuing to involve the key stakeholders is important.

<i>Flying high</i>
<p>Review of impact and results of evaluation</p> <p>Identification of success factors</p> <p>Transregional and international promotion and co-operation</p> <p>Identification of threats</p> <p>Continuing buy-in</p> <ul style="list-style-type: none"> <li>- At policy level</li> <li>- Among stakeholders</li> </ul> <p>Ensuring a dividend for the local population</p>

The strategy framework therefore suggests a steady progression on the basis of sound initial analysis through processes which build, support and then exploit competitive advantage.

## 4. Presentation of the press review

A press review was also required for this briefing, particularly to assist with identifying success stories of innovation-based regional development from around Europe.

To identify the articles CSES searched in various databases (GoogleNews, MagPortal.com and Nexis.com) based on a similar set of keywords to those used for the literature review. However, in order to focus more on journalistic language, keywords like ‘evaluation’ were replaced by ‘success stories’ and additional keywords to describe clusters (such as ‘high tech hubs’) were also used<sup>58</sup>. In addition, in order to address the expected bias towards the UK we repeated the search with the use of terms like “Europe” or the name of different countries. Some of the searches were also repeated in Spanish, German and French.

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<sup>58</sup> A full list of keywords is presented in section 8.2.



## 5. Presentation of the ‘stories’

*After initially identifying more than 25 cases, a total of 11 were selected across a range of intervention types, regions and levels of information provided. An additional web search was used to complement the results of the press coverage.*

### 5.1 The Manchester Fab Lab

<b>Title</b>	<b>The Manchester Fab Lab</b>
Type of intervention	Strengthen entrepreneurial innovation in the SME sector
<i>Location</i>	North West, UK
<i>Innovation level of region</i>	Medium-high
<i>Level of regional government autonomy</i>	Region in a decentralised unitary state with established elected regional authorities with medium-low level of political autonomy
<i>Description of intervention</i>	<p>The Fab Lab of Manchester was established in 2010. It is an application of an idea initially applied in an outreach project by Massachusetts Institute of Technology (MIT) with 35 Fab Labs currently operating around the world.</p> <p>Fab Labs are designed to bring innovation to grass roots communities, in order to provide local solutions for local problems. Starting with an impressive endowment of advanced design and manufacturing technology, Fab Labs aim to engage a wide basis of support in their further development in the form of people, skills, equipment and resources. Fab Lab Manchester provides extensive facilities which can be used for a variety of applications by individuals, firms, schools, universities and other organisations.</p> <p>'Fab Labbers' can use the advanced digital and manufacturing technology to make products out of wood, acrylic, composite moulds, silicon, cardboard, sheet aluminium, plastics, copper foil and vinyl. There are waxing, chemical moulding, milling and routing, laser cutting, electronics, textiles, embroidery, vinyl cutting and 3D scanning and printing facilities allowing development of prototypes. Business, innovation support and specialised information on IP are provided in cooperation with the</p>

	<p>Business Link network, the University of Manchester and the Manchester city council.</p> <p>The Fab Lab is free to non-commercial users. Businesses and inventors can opt to protect their product development ideas by paying to use the service. It will reverse the top down approach to technological advancement by empowering everyone to invent.</p>
<i>Period</i>	2010-ongoing
<i>Sectors covered</i>	Businesses, schools/universities, community, individuals
<i>Role of regional authorities</i>	The Fab Lab was created by the Manufacturing Institute - an independent charity founded by North West manufacturers and universities. Regional and local authorities financed part of the project. (we know the budget?)
<i>Financial support/partners</i>	The Manufacturing Institute , with the support of the Northwest Regional Development Agency, Manchester: Knowledge Capital, Manchester City Council, Manchester's Commission for the New Economy, NESTA
<i>Main impact</i>	Since the project in Manchester was only launched in March 2010, the results are not yet clear, but experience elsewhere suggests that the approach is particularly fruitful in generating innovative responses to community issues.
<i>Reasons for highlighting the case</i>	This case represents an innovative approach to providing access to technology and innovative support services for SMEs and the local community. It seeks to shift the balance of competitive advantage and allow for smaller scale production in a community with strong manufacturing traditions.
<i>Reference</i>	<a href="http://www.fablabmanchester.org/">http://www.fablabmanchester.org/</a> Financial Times 23.3.2010

## 5.2 Creative industries support programme

<b>Title</b>	<b>Creative industries support programme</b>
Type of intervention	Human capital development
<i>Location</i>	UK, West Midlands
<i>Innovation level of region</i>	Medium-high
<i>Level of regional government autonomy</i>	Region in a decentralised unitary state with established elected regional authorities with medium-low level of political autonomy
<i>Description of intervention</i>	<p>The first intervention aiming to strengthen skills in the media sector in the region came from employers that created the Interactive Media Cluster Opportunity Group. The objective is to develop skills in interactive media – such as film, TV, radio and digital, and creative and cultural media – including music, design, advertising and the arts.</p> <p>This was followed by the local city council supporting eight specialist training projects including the University of Central England’s TIC i4 and Online Music Development, Creative Alliance, the Screen WM Training Fund, Creative Launchpad and Kidderminster College. Furthermore, the Kidderminster College was helped to develop a course providing a professional qualification certificate.</p> <p>MAS Records – short for Mighty Atom Smasher – is a project helping to promote some of the West Midlands’ newest rock and indie bands. It provides support to music groups in recording, promoting and developing marketing plans.</p>
<i>Period</i>	2004-ongoing
<i>Sectors covered</i>	Creative industries
<i>Role of regional authorities</i>	While the idea came from the private sector, local authorities (through the Learning and Skills Council of Birmingham) were the main driver for the implementation.
<i>Financial support</i>	Not available

<i>Main impact</i>	<p>The number of people working in the sector increased by 15% in two years, reaching 60,000.</p> <p>Furthermore, more graduates turn their attention from traditional professions to careers in media, graphic design, educational software and cultural heritage, helping to diversify the economy</p>
<i>Reasons for highlighting the case</i>	<p>An example of combining the development opportunities of the creative sector with support in upgrading/strengthening human capital.</p>
<i>Reference</i>	<p>Birmingham post, Creative industries booming, Joanna Gerry, 5/3/2007  <a href="http://www.birminghampost.net/birmingham-business/tm_headline=creative-industries-booming&amp;method=full&amp;objectid=18708620&amp;siteid=50002-name_page.html">http://www.birminghampost.net/birmingham-business/tm_headline=creative-industries-booming&amp;method=full&amp;objectid=18708620&amp;siteid=50002-name_page.html</a></p>

### 5.3 Aviation Valley

<b>Title</b>	<b>Aviation Valley cluster</b>
<i>Type of intervention</i>	Cluster development
<i>Location</i>	Subcarpathian (Rzeszow), Poland
<i>Innovation level of region</i>	Low
<i>Level of regional autonomy</i>	Region in a decentralised unitary state with established elected regional authorities with medium-low level of political autonomy
<i>Description of intervention</i>	<p>The creation of the Aviation Valley association in 2003 aimed to promote the development of an aviation cluster in a region that has 70 years of history in aircraft production. 90% of the Polish aerospace industry is concentrated in the area and the sector has 22,000 employees. The objective is to develop links within the local industry and with educational and research establishments, and to attract overseas investors.</p> <p>Furthermore, with funding through the INTERREG programme in the period 2005-2006 a number of networking activities and infrastructure were developed, including an online portal providing information on SME needs in relation to R&amp;D and professional training and opportunities at Rzeszow Technical University; organisation of cluster promotional activities such as regional conferences; and organisation of inter-regional seminars and study trips aimed at exchanging good practice in various fields of cluster development.</p>
<i>Period</i>	2003-ongoing
<i>Sectors covered</i>	Aviation/aerospace industry
<i>Role of regional authorities</i>	The cluster development was initiated and managed by the Aviation Valley Association (a grouping of leading regional enterprises) but the local authorities through the Rzeszow Regional Development Agency and Rzeszow Technical University have been involved as partners in the association and contributed to the funding.
<i>Financial support</i>	EU support for Interreg project (€104,000)

<i>Main impact</i>	Too early to assess but the area has lured a number of international investors in the past few years. While employment has fallen drastically since the inefficient era of the early 1990s, it is now climbing again. Companies speak of a continuous struggle to find skilled workers.
<i>Reasons for highlighting the case</i>	Example of (potentially) successful mechanism for development of cluster to strengthen and upgrade existing industrial base in a lagging region, driven by the private sector and supported by regional/authorities.
<i>Reference</i>	Flight Global journal, Air transport, Murdo Morrison 09/05/2006 <a href="http://www.flightglobal.com/articles/2006/05/09/206519/into-the-valley-polish-aerospace.html">http://www.flightglobal.com/articles/2006/05/09/206519/into-the-valley-polish-aerospace.html</a> <a href="http://ec.europa.eu/regional_policy/cooperation/interregional/ecochange/goodpractice/1knowledge/1cluster/pl_aviation.pdf">http://ec.europa.eu/regional_policy/cooperation/interregional/ecochange/goodpractice/1knowledge/1cluster/pl_aviation.pdf</a>

## 5.4 BioWin Cluster project – Wallonia

<i>Title</i>	BioWin Health Cluster development project – Wallonia
<i>Location</i>	Wallonia, BE
<i>Innovation base of region</i>	Medium – High
<i>Level of regional government autonomy</i>	Region in federal state with very high levels of autonomy
<i>Description of intervention</i>	<p>Development of a health services/technologies cluster based on the pre-existing research base in the Louvain Catholic University, the Brussels Free University and the University of Liege and a number of local and international companies with over 30% of their workforce dedicated to R&amp;D.</p> <p>BioWin was created in 2006 as part of the regional authorities' development plan, the Marshal Plan for Wallonia.</p> <p>The BioWin cluster organisation was created to coordinate activities for implementing joint R&amp;D projects and networking focused on bringing together companies and research institutes in such a way that each can leverage the competencies of other partners. Funding for activities comes through the regional plan but also through promoting access to national and European programmes.</p>
<i>Period</i>	2006-ongoing
<i>Sectors covered</i>	Biotechnology/Health technologies and services
<i>Role of regional authorities</i>	Initiator, promoter, main funding (including access to EU/national funds).
<i>Financial support</i>	Not available
<i>Main impact</i>	Still too early to assess. According to the publication the cluster generates a turnover of over €3bn and employs some 13,000 people.
<i>Reasons for highlighting the case</i>	Typical example of active involvement of regional authorities to exploit existing public knowledge base in the public and private sector, to enhance linkages and cooperation and create a functional cluster.
<i>Reference</i>	FDI magazine: - Wallonia makes waves April 15,2010 <a href="http://www.fdimagazine.com/news/fullstory.php/aid/3321/">http://www.fdimagazine.com/news/fullstory.php/aid/3321/</a>

## 5.5 Smart City – Renewable energy project

<b>Title</b>	<b>Smart City – Renewable energy project</b>
<i>Type of intervention</i>	Industrial and strategic technology policy
<i>Location</i>	Andalusia (Malaga), ES
<i>Innovation level of region</i>	Medium-Low
<i>Regional autonomy</i>	Region with elected regional governments with constitutional status, legislative powers and a high degree of autonomy
<i>Intervention</i>	<p>The "Smart City" project, a collaboration between the government and businesses that will deploy state of the art information technology to maximize the use of renewable energy and lead to emissions savings of 20%, or 6,000 metric tons/year.</p> <p>11,000 residents and 1,200 businesses in the coastal Misericordia district of the city will be supplied with power from local renewable production. Several public buildings will also be converted into "smart" buildings, producing their own energy while the seafront promenade will be lined with micro wind turbines.</p> <p>The SmartCity project aims to fully integrate renewable technologies into the power grid by installing photovoltaic panels in public buildings, using micro-generation electricity in hotels and installing small wind turbines in the area. Systems will be used for energy storage in batteries, for air conditioning in buildings, street lighting and urban mobility. In particular, the latter will be improved by enhancing the use of electric cars, installing charging stations and introducing a number of experimental vehicles.</p>
<i>Period</i>	2009-ongoing
<i>Sectors covered</i>	Energy production, distribution. Environmental technologies
<i>Role of regional authorities</i>	Design of policy, funding and support. Cooperation with private sector for implementation.
<i>Financial support</i>	€1 million through combination of EU funding, provincial/regional/national government, companies

<i>Main impact</i>	It is not currently possible to assess the impact. The project's objective is to achieve 20% energy savings and reduce emissions by over 6,000 tons of CO2 per year.
<i>Reason for highlighting the case</i>	Example of a project supporting the development and diffusion of renewable energy technologies and eco-efficiency through demand-based policies. Provides a platform for the development and application of technologies and makes the region a point of reference for R&D in this sector.
<i>Reference</i>	Renewable energy world.com 14/7/2009 <a href="http://www.renewableenergyworld.com/rea/news/article/2009/07/andalucia-government-launches-smartcity-plan">http://www.renewableenergyworld.com/rea/news/article/2009/07/andalucia-government-launches-smartcity-plan</a>

## 5.6 Food Innovation at Interfaces

<i>Title</i>	<b>Food Innovation at Interfaces</b>
<i>Location</i>	Southern Sweden, SE
<i>Type of intervention</i>	Encourage technology and knowledge transfer from the public sector
<i>Region's innovation group</i>	Region in a decentralised unitary state with established elected regional authorities with a medium-low level of political autonomy
<i>Regional autonomy</i>	Low
<i>Intervention</i>	<p>Food Innovation at Interfaces was a regional programme partly funded by the national support programme VINNVAEXT. It aimed to increase the added value of the existing food industries of the region (600 companies with a total of 15,000 employees) and promote their products and services by targeting new market opportunities in areas such as functional foods, convenience foods, high-quality niche products and ecological products.</p> <p>Aiming to upgrade the innovative capacity of the food industry the programme emphasized the strengthening of ties between research activities at universities in the region, particularly Lund University, a globally renowned university but with limited connections with the more traditional food industry.</p> <p>The programme consisted of four project areas:</p> <ol style="list-style-type: none"> <li>(1) Food and Health/Functional Food, a science-driven project that aims to strengthen the Functional Food Science Centre.</li> <li>(2) Better Food in Big Scale/Convenient foods addresses research for convenience food in spheres such as logistics, risk analysis, food quality, food processing and consumer behaviour.</li> <li>(3) Market, Consumers and Evaluation, concerned with non-technological aspects of food innovation as it intends to enhance knowledge, communications and tools for the international marketing of advanced food products.</li> <li>(4) Innovation in theory and practice supports entrepreneurial activities through Ideon Agro Food, a</li> </ol>

	technology transfer office located at the science park Ideon set up to finance and support the commercialization of Lund University based research related to food.
<i>Period</i>	2004-2007 (1 <sup>st</sup> period) – Renewed for period 2007-2010
<i>Sectors covered</i>	Food sector
<i>Role of regional authority</i>	The regional authorities played an active role by prioritizing the food industry in its regional development strategy and provided political support and visibility for Food Innovation at Interfaces. Furthermore they co-funded the programme budget by 50%.
<i>Financial support</i>	Ca. €70 million
<i>Main impact</i>	<p>The project is in its early stages and the results are still unclear.</p> <p>According to the studies it has helped to create a regional “governance milieu” that is conducive to public–private collaboration by creating a dialogue between stakeholders from industry and the university, and has helped a number of companies to move towards high added value by introducing new products. By 2008 more than 100 projects had been developed with around 150 companies.</p>
<i>Reasons for highlighting the case</i>	Example of a programme linking a mature/traditional industry with limited development prospects to an existing – but disconnected – knowledge base in order to revitalise and upgrade the industry.
<i>Reference</i>	<p>Coenen L, (2007), The role of universities in the regional innovation systems of the North East of England and Scania, Sweden: providing missing links?, <i>Environment and Planning C: Government and Policy</i>, 25:6, 803 – 821</p> <p>Coenen L, Moodysson J, (2009), Putting Constructed Regional Advantage into Swedish Practice, <i>European planning studies</i>, 17: 4, 587-604</p> <p><a href="http://www.vinnova.se/upload/EPiStorePDF/InnovationHotbeds.pdf">http://www.vinnova.se/upload/EPiStorePDF/InnovationHotbeds.pdf</a></p>

## 5.7 Cultural Industries Task Force

<i>Title</i>	<b>Cultural Industries Task Force</b>
<i>Location</i>	South East England (Cornwall), UK
<i>Type of intervention</i>	Innovation governance
<i>Region's innovation group</i>	Mid-High
<i>Regional autonomy</i>	Region in a decentralised unitary state with established elected regional authorities with a medium-low level of political autonomy
<i>Intervention</i>	<p>With the support of the local authorities in Cornwall, a Task Force was created bringing together the different players in the creative sector. The objective of the task force was to provide a focus through which to explore and promote a structured approach to developing the cultural industries in the region, especially in view of the funding available through the EU structural funds for the period 2001-2006. The whole of Cornwall was an Objective 1 area.</p> <p>The Cultural Industries Task Force brought together a series of existing networks, a number of which had already been established as part of earlier Structural Fund programmes' Objective 5b funding, and gradually extended its reach across other, less co-ordinated cultural sectors.</p> <p>In particular, it provided guidance to applicants and helped them both to navigate their way through the formalities and to focus on delivering economic and social regeneration. The report comments that the Task Force was particularly 'effective in reconciling the intellectual and emotional environment of the arts and creativity with the need to be business-like' It concludes that a cohesive creative sector was created from a previously disparate series of activities.</p>
<i>Period</i>	2001-2006
<i>Sectors covered</i>	Creative industries
<i>Role of regional/local authorities</i>	Initiator and coordinator of the task force
<i>Financial support</i>	No information
<i>Main impact</i>	The Task Force had a major influence in encouraging a

	<p>consistent approach to the development of the sector and helped relevant players to get access to Objective 1 funds to support a range of creative industry projects, including large capital projects such as investment in a university campus focusing on the creative sector and support for SMEs in the creative industries sector.</p> <p>An assessment showed some striking results. These included 29% turnover growth in the creative sector between 2000 and 2004, growth in Gross Value Added of 34% compared with 7% nationally, an increase in employment of 19%, and an increase in the number of businesses by 23%.</p>
<i>Reasons for highlighting the case</i>	Example of authorities playing a decisive role in bringing together relevant players and helping to define a clear development strategy and identify priority actions in a knowledge based sector.
<i>Reference(s)</i>	<a href="http://www.objectiveone.com/O1htm/01-partners/taskforce_intro.htm">http://www.objectiveone.com/O1htm/01-partners/taskforce_intro.htm</a> <a href="http://perfect-moment.co.uk/wb/media/download_gallery/pm_cc_report_download.pdf">http://perfect-moment.co.uk/wb/media/download_gallery/pm_cc_report_download.pdf</a>

## 5.8 Business Angels Network (BAN) Flanders

<i>Title</i>	<b>Business Angels Network (BAN) Flanders – Business Angels Network (BAN) Vlaanderen</b>
<i>Location</i>	Flanders, BE
<i>Type of intervention</i>	Financial support instrument
<i>Innovation group of region</i>	Medium-High
<i>Regional autonomy</i>	Region in a federal state with very high levels of autonomy
<i>Description of intervention</i>	<p>Business Angel Networks are forums of Business Angels where entrepreneurs can pitch their ideas face-to-face to members of the network and have an in-depth discussion with potentially interested BAs. BANs tackle the difficulties faced by Flemish companies in gaining access to risk capital.</p> <p>With the support of the European Commission, the Flemish government supported the creation of the first Belgian Business Angel Network, Vlerick BAN, in 1999. Three other BANs were subsequently founded and subsidised.</p> <p>The five core tasks of the BANs were to:</p> <ol style="list-style-type: none"> <li>1. raise awareness of entrepreneurs and candidate investors;</li> <li>2. inform, train and prepare entrepreneurs;</li> <li>3. inform and prepare business angels;</li> <li>4. bring together entrepreneurs and business angels (matching events);</li> <li>5. bring together business angels with a view to creating associations.</li> </ol> <p>In January 2004, the four Business Angel Networks that were officially recognised by the Flemish Government, merged into one network: Business Angels Network Flanders (BAN).</p>
<i>Period</i>	1999-2004
<i>Sectors covered</i>	All sectors
<i>Role of regional authorities</i>	Co-funding
<i>Financial</i>	The total amount of subsidies granted to the four BANs

<i>support</i>	between 1999 and 2004 was €56,741.
<i>Main impact</i>	<p>Together, the four BANs represented 140 Business Angels and 58 deals in 55 companies, in which 54 BAs invested between 1999 and 2004.</p> <p>BAN-backed companies generally contributed as much as companies that found BA financing without a BAN and significantly more than non-BA-backed companies in terms of value added and job creation.</p> <p>The 55 BAN-backed companies together added €73.2 million in value (estimate). Each euro of government subsidy spent on the Flemish BANs generated an estimated €5.39 in added value.</p> <p>All BAN-backed companies paid €84,852 in taxes (estimate). Hence, it is estimated that each euro of government money spent on the BANs generated a direct return of €1.03 in taxes.</p> <p>All BAN-backed companies together employed 495 people, representing a net gain of 102 jobs. Each BAN-backed company created 1.84 jobs on average over the period under observation (corresponding to an average yearly growth of 0.52 full-time equivalent jobs), representing a subsidy of €3,399 per job created.</p>
<i>Reasons for highlighting the case</i>	Risk capital support programmes are considered as warranted as geographic proximity is important in the early stages of the investor–investee relationship. The results and return on investment were significant.
<i>Reference</i>	Assessment of Government Funding of Business Angel Networks in Flanders, Collewaert V, Manigart S, Aernoudt R (2010), <i>Regional studies</i> , 44: 1, 119-130 and <a href="http://www.banvlaanderen.be/">http://www.banvlaanderen.be/</a>

## 5.9 New Technology programme for SMEs

<i>Title</i>	<b>New Technology support for SMEs</b>
<i>Location</i>	Northern Norway
<i>Type of intervention</i>	Strengthen entrepreneurial innovation in the SME sector
<i>Region's innovation group</i>	Medium-High
<i>Regional autonomy</i>	Region in a decentralised unitary state with established elected regional authorities with medium-low level of political autonomy
<i>Intervention</i>	<p>The NT programme was initially established as an important element in research and development initiatives for Northern Norway from 1987. The primary emphasis was on the specific development of new products and processes and their introduction to the market. NT focuses on SME innovation projects, and tailors support to meet SMEs' specific needs, both technological and non-technological.</p> <p>The NT programme supported innovative activities by SMEs combining financial support with much 'soft' support and advice. NT also supports learning processes with practical tools including courses in areas such as project management, patenting, product development, negotiating techniques and company.</p> <p>Furthermore, NT staff act as a broker to couple the SMEs with research institutions and other SMEs.</p>
<i>Period covered</i>	1993-1996
<i>Sectors covered</i>	Manufacturing and consulting to SMEs
<i>Role of regional authority</i>	The programme was initiated and financed by the Norwegian Industrial Development Fund (national level). Regional authorities had a rather limited role in implementation as an independent secretariat was established in the region.
<i>Financial support</i>	€3.1 million per year

<i>Main impact</i>	<p>According to an evaluation of the programme, its main achievements were:</p> <ul style="list-style-type: none"> <li>- 75% of SMEs supported from 1993 to 1996 reported that further R&amp;D activity had either been initiated or was planned.</li> <li>- approximately 35% of SMEs had changed or improved products or processes developed in the NT projects.</li> <li>- Almost half of the supported SMEs were involved in some form of spin-off during the second phase of the programme.</li> <li>- The majority of firms reported productivity increases of 6–10%.</li> </ul>
<i>Reasons for highlighting the case</i>	<p>While being primarily a financial support tool, the NT programme is an example of an all-round support scheme for innovation tailored at local level. Tools are deployed flexibly so as to focus on SMEs' innovation projects.</p>
<i>Reference</i>	<p>Isaksen, Arne and Remøe, Svend Otto(2001) 'New Approaches to Innovation Policy: Some Norwegian Examples', <i>European Planning Studies</i>, 9: 3, 285 — 302</p>

## 5.10 Growth Houses

<b>Title</b>	<b>Growth Houses</b>
<i>Location</i>	Mid Jutland, Denmark
<i>Type of region</i>	Mixed
<i>Level of regional government autonomy</i>	Region in a decentralised unitary state with established elected regional authorities with medium-low level of political autonomy.
<i>Description of intervention</i>	<p>Growth Houses (Vaeksthuse) are specialised business support agencies that offer information and advice to help businesses grow.</p> <p>They are to be found across Denmark, but have been developed to target assistance to businesses locally. They were launched as part of a national strategy to promote growth businesses in Denmark.</p> <p>The Growth House in Århus forms part of a more general business support centre. It offers specific services for growing enterprises, including advice on various issues confronted by innovating businesses. A ‘capital coach’, for instance, can help enterprises think through their strategy for financing developments. Help can also be provided with developing the right skills within the enterprise or with beginning to operate internationally. There is also financial support available for advice from independent advisers.</p> <p>In addition, Growth Houses offer specialised services of particular interest to growing and innovative companies, such as advice on managing and enforcing intellectual property rights. This service is provided in association with the Danish Patent and Trade Mark Office.</p>
<i>Period</i>	2007 -
<i>Sectors covered</i>	All sectors
<i>Role of regional authorities</i>	Local authorities support the initiative at regional level within a national framework
<i>Financial support/partners</i>	19 municipalities in the Mid Jutland region fund the Growth house with central government and some private sector support.
<i>Main impact</i>	A relatively recent initiative that aims to increase the number of growth businesses in Denmark.

<i>Reasons for highlighting the case</i>	General business support services are an important instrument for promoting innovation. In this case a package of services has been developed that are specifically targeted at businesses capable of growing. Although operating within a national framework, the service is delivered locally through the regions. The case represents a specific application of a basic support function of special interest in the context of promoting innovation.
<i>Reference</i>	<a href="http://www.startvaekst.dk/vhmidtjylland.dk/regionmidtjylland">http://www.startvaekst.dk/vhmidtjylland.dk/regionmidtjylland</a> <a href="http://www.ebst.dk/erhvervsudviklingfokus/66558">http://www.ebst.dk/erhvervsudviklingfokus/66558</a>

## 5.11 Regional Financial Support

<b>Title</b>	<b>Regional Financial Support</b>
<i>Location</i>	Hesse, Germany
<i>Type of region</i>	Mixed
<i>Level of regional government autonomy</i>	Very high
<i>Description of intervention</i>	<p>The land of Hesse in Germany offers a variety of funding schemes to businesses in the region through the Wirtschafts- und Infrastrukturbank Hessen, Hessen Kapital, and other regional agencies. These range from subsidies in certain areas to loan guarantees and loans and to equity finance. The schemes are often run in co-operation with national agencies, such as the Kreditanstalt für Wiederaufbau (KfW), but local knowledge and regional adaptations make them much more accessible for SMEs.</p> <p>Schemes that are of particular interest in terms of innovation are:</p> <p><i>Innovation support schemes:</i> subsidies for research co-operation between SMEs and partners at universities, research institutions or larger corporations can be provided by the federal government as part of the central innovation programme for SMEs. The funds can only be used during the development phase of products or processes prior to their being brought to market.</p> <p><i>Innovation programmes:</i> Loans at subsidised interest rates, provided under the ERP innovation programme, are used to finance the launch phase of products. The loans serve to cover the cost of market research and information, investments related to market launch, and the cost of management consultancy and staff training.</p> <p><i>Hessen Kapital:</i> provides financing through a scheme offered to medium-sized companies in Hesse to support innovation and growth projects at all stages of the company's development, including the start-up phase. The scheme aims to strengthen the companies' equity base. Funding similar to equity is provided, primarily in the form of silent participation or open investment.</p>

<i>Period</i>	Ongoing
<i>Sectors covered</i>	All sectors
<i>Role of regional authorities</i>	Regional agencies provide access to finance at a regional level through programmes that are tailored to local requirements, though often within a national framework.
<i>Financial support/partners</i>	Funds provided through Wirtschafts- und Infrastrukturbank Hessen in co-operation with national agencies, such as the Kreditanstalt für Wiederaufbau (KfW).
<i>Main impact</i>	A variety of finance schemes operate, each with their own particular impact.
<i>Reasons for highlighting the case</i>	Making SME access to funds more user-friendly is a challenge for banks and financial institutions. With local knowledge and sensitivity to regional issues, regional support structures can greatly assist this process. With their high degree of regional autonomy, the German laender are in a good position to fulfil this function.
<i>Reference</i>	<a href="http://www.invest-in-hessen.de/dynasite.cfm?dsmid=11276">http://www.invest-in-hessen.de/dynasite.cfm?dsmid=11276</a> <a href="http://www.invest-in-hessen.de/dynasite.cfm?dsmid=11278">http://www.invest-in-hessen.de/dynasite.cfm?dsmid=11278</a> <a href="http://www.hessen-kapital.de/home.htm">http://www.hessen-kapital.de/home.htm</a>



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# 7. Database searches

## 7.1 Academic literature review

### Databases used<sup>59</sup>:

- ISI Web of Knowledge (Thomson Reuters) - [www.isiknowledge.com/](http://www.isiknowledge.com/) : Covers about 8,700 leading journals in science, technology, social sciences, arts, and humanities
- Science Direct (Elsevier) - [www.sciencedirect.com](http://www.sciencedirect.com) : 10 million articles from over 2,500 journals and over 6,000 e-books, reference works, book series and handbooks issued by Elsevier.
- Google Scholar (Google Inc) – scholar.google.com : freely-accessible Web search engine that indexes the full text of scholarly literature

### Keywords/Key-strings used (alone or in combination)

<b>Innovation policies/measures</b>	<b>Regional impact</b>	<b>Role of authorities</b>
regional innovation support	regional growth regional development	regional/local authorities Regional development agencies
regional innovation measures	regional performance evaluation	Regional governance
regional innovation policy	assessment effectiveness	
clusters	success cases	
high-tech hubs	performance	
knowledge based clusters	new firms creation	
creative industries	firms performance	
incubators	Foreign direct investment (FDI)	
science parks		
innovation finance		
venture capital		
seed fund		
high-tech hubs		
start-ups		
SMEs support		

<sup>59</sup> Access to these database was provided through the use of the library services of the London School of Economics and Political Science

<b>Innovation policies/measures</b>	<b>Regional impact</b>	<b>Role of authorities</b>
innovation strategies R&D/technology support Technology centres Technology/innovation programmes Innovation strategies Demand driven innovation Procurement		

## 7.2 Press review

### Databases used<sup>60</sup>

GoogleNews and Google news archive search (Google Inc)-  
<http://news.google.co.uk/archivesearch>: Google News is an automated news aggregator from around the world.

Nexis database (ReedElsevier) – [www.nexis.com](http://www.nexis.com) : Searchable database with content from 20,000+ global news sources, company & industry intelligence providers, biographical and reference sources, intellectual property records, public records, legislative and regulatory filings and legal materials.

MagPortal (Hot Neuron LLC) - <http://www.magportal.com/c/bus/>: Database that indexes articles from magazine websites, but it also includes some daily publications

### Keywords/Key-strings used (alone or in combination)

<b>Innovation policies/measures</b>	<b>Regional impact</b>	<b>Role of authorities</b>
clusters	regional growth	regional/local authorities
knowledge based clusters	regional development	regional/local
creative industries	high-tech/innovation	government
incubators	hubs	regional development
science parks	clusters	agencies
innovation	innovation	
venture capital	employment creation	
seed funds	success cases/stories	
innovation support	firms performance	
high-technology hubs	success stories	
technology centres	case studies	

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<sup>60</sup> Access to these database was provided through the use of the library services of the London School of Economics and Political Science



# **Annex 1: Summary table of documents reviewed**

	<b>Title</b>	<b>Author/Journal</b>	<b>Region</b>	<b>Autonomy/ Innovation level</b>	<b>Intervention</b>	<b>Main conclusions + impacts reported (if available)</b>
<b>Cluster creation/strengthening support policies</b>						
1	Learning to let go: The role of the public sector in cluster building in the Basque Country and Scotland	Taylor, S., Raines, P., Learning To Let Go: The Role of the Public Sector in Cluster Building in the Basque Country and Scotland, European Policy Research Centre papers, No 48, 2001,	Basque Country, ES	High Med-High	Cluster building	Informal community developed and strengthening of cooperation Sustainability unclear
			Scotland, UK	Very High Med-High	Cluster building	Informal community developed and strengthening of cooperation Sustainability unclear
2	Multi-level Science Policy and Regional Innovation: The Case of the Munich Cluster for Pharmaceutical Biotechnology	Kaiser, R.,(2003), Multi-level Science Policy and Regional Innovation: The Case of the Munich Cluster for Pharmaceutical Biotechnology, European Planning Studies, Vol. 11, No. 7	Bavaria, DE	Very High High	Pharmaceutical cluster development support	Support existing strong knowledge base to transform into an international cluster. Attract more firms and venture capital.
3	Innovation in the functional foods industry in a peripheral region of the European Union: Andalusia (Spain)	Daniel Arias-Aranda, M. Mercedes Romerosa-Martínez (2010), Food Policy, In Press	Andalusia, ES	High Med-Low	Support for development of functional foods cluster	The study refers to an ongoing policy in the design stages

	<b>Title</b>	<b>Author/Journal</b>	<b>Region</b>	<b>Autonomy/ Innovation level</b>	<b>Intervention</b>	<b>Main conclusions + impacts reported (if available)</b>
4	Regional social capital: Embeddedness, innovation networks and regional economic development	Rutten, R., Boekema, F., (2007), Technological Forecasting and Social Change, Volume 74, Issue 9, Pages 1834-1846	Noord-Brabant, NL	Low High	Stimulus Cluster Scheme : funding of small and medium-sized enterprises (SMEs) to develop clusters and market new products	- 75% of all clusters developed a new product and successfully introduced it on the market; 1/3 <sup>rd</sup> of the participating companies now generate 20% or more of their turnover from the new product ; 80% of the companies involved still maintain relations with one or more of their cluster partners.
5	Increasing the impact of ICT in the regional economy through a virtuous integration of research, enterprise and venture capital	Prieto D	Piedmont, IT	High Average	ICT cluster	N/A
6	Knowledge intensive Industrial Clustering around Océ; Embedding a vertical disintegrating model in the Eindhoven-Venlo region	Wintjes, Rene Cobbenhagen, Jan (MERIT)	Limburg, NL	Low High	KIC programme for cluster development	Limited life of clusters but improvement of innovative capacity of participants. Employment creation for some participating firms
7	Competitive Regional Clusters – National Policy Approaches	OECD Reviews of regional innovation	French regions	Medium Multiple	Local Production Systems (SPL) promotion: Engage actors. Networking Fund joint activities	Employment growth 9% versus 5.7% in equivalent sectors with no SPLs

	<b>Title</b>	<b>Author/Journal</b>	<b>Region</b>	<b>Autonomy/ Innovation level</b>	<b>Intervention</b>	<b>Main conclusions + impacts reported (if available)</b>
8	Competitive Regional Clusters – National Policy Approaches	OECD Reviews of regional innovation	German advanced-high tech regions	Very High High	BioRegio: Strengthen existing biotechnology clusters Finance/R&D collaboration/Networking-Coordination/ Business support	Result in 4 regions: >300% increase in the number of biotech companies >9 000 jobs Regions: Higher than national average increase in biotech jobs
9	Competitive Regional Clusters – National Policy Approaches	OECD Reviews of regional innovation	German lagging regions	Very High Med-Low - Average	InnoRegio programme: Formation of innovative networks (companies, universities, governments) – Finance for collaborative R&D among network members	Higher level of R&D activity than East Germany average
10	Competitive Regional Clusters – National Policy Approaches	OECD Reviews of regional innovation	Basque Country, ES	High Med-High	Basque country Competitiveness programme : Engage actors Develop cluster strategy Networking	Public/private collaboration, strategic cluster orientation. Creation of various export consortia and technology projects.
11	Innovative clusters: Drivers of national innovation systems	Pim den Hertog, Svend Remoe, OECD	Multiple	Multiple	Cluster development programmes/policies	N/A

	<b>Title</b>	<b>Author/Journal</b>	<b>Region</b>	<b>Autonomy/ Innovation level</b>	<b>Intervention</b>	<b>Main conclusions + impacts reported (if available)</b>
12	Multi-level science policy and regional innovation: The case of the Munich cluster for pharmaceutical biotechnology	Kaiser R., (2003), EUROPEAN PLANNING STUDIES Volume: 11 Issue: 7 Pages: 841-857 Published: OCT 2003	Bavaria	Very High High	biotech cluster	The Munich cluster for pharmaceutical biotechnology has now entered into a phase of consolidation characterized by internal growth of already established organizations. The cluster is developing into a knowledge-based cluster, even if various indicators show that it is still well behind leading locations in the US or Britain.
13	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F.,(eds.), Edward Elga	Limburg, NL	High Med-High	KIM: Knowledge-carriers in Industrial Medium and small firms : Researcher mobility programme	Induce innovative activity
14	Innovating in Cluster/Cluster as Innovation: The Case of the Biotechvalley Cluster Initiative	Henrik Mattsson European Planning Studies, 1469-5944, Volume 17, Issue 11, 2009, Pages 1625 – 1643	Strangas, SE	Low High	Biotech cluster initiative	No proper cluster created but still positive effects on regional competitiveness, considerable success in stimulating new production practices and in attracting investments. Some of this success can be ascribed to the cluster initiative working as a social or organizational innovation.

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15	Putting Porter into Practice? Practices of Regional Cluster Building: Evidence from Sweden	Per Lundequist ;Dominic Power (2002), European Planning Studies, Vol. 10, No. 6	13 Swedish regions	Low High/ Med- High	Cluster development	Analysis of creation processes. No results
16	The co-evolution of social and physical infrastructure for biotechnology innovation in Turku, Finland	Maria Höyssä, Henrik Bruun, Janne Hukkinen, (2004), Research Policy, Volume 33, Issue 5, July 2004, Pages 769-785	Finland / high tech areas	Low High	Turku/ BioCity Bio Valley Ltd : Supporting partnerships between universities and industry and government	Collaboration and an accumulation of social capital that set the emerging cluster onto a very constructive trajectory of interaction.
17	Industrial innovation: Direct evidence from a cluster-oriented policy	Oliver Falck, Stephan Heblich, Stefan Kipar (2010), Regional Science and Urban Economics, In Press	Bavaria, DE	Very High High	High-Tech Offensive programme (€1.35 billion) for hi-tech centres, regional technology concepts, support qualification measures, start-ups, and support international link-ups.	Increased the likelihood of firms becoming innovators in the target industries by 4.6 to 5.7%. R&D expenditures decreased by 19.4% on average for firms in target industries in Bavaria. Increase of possibility of obtaining access to external know-how, for cooperation with public scientific institutes, and for access to suitable R&D personnel.
18	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling,	Limburg, NL	Medium Med-High	Cluster development support programme	Limited life of clusters but improvement of innovative capacity of participants. Employment creation for some participating firms

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		F.,(eds.), Edward Elga				
<b>Exploit university knowledge base</b>						
19	The role of universities in the regional innovation systems of the North East of England and Scania, Sweden: providing missing links?"	Coenen L, 2007, Environment and Planning C: Government and Policy 25(6) 803 – 821	North East, UK	Low Med-High	Strategy for Success programme (Science and Industry Council, regional exploitation agency, and five Centres for Excellence)	Refocus on region towards new science-based sector - move away from traditional industry. Development of nascent biotechnology sector. Still small
			Scania region Sweden	Low High	Scania Food Innovation Network – support cluster development in food sector Food Innovation at Interfaces: support U-I cooperation	Exploit existing knowledge system to support traditional sector. Successful in creating linkages. Results not reported.
20	Universities and regional advantage: higher education and innovation policies in English regions	Fumi Kitagawa	all UK regions	Low Med-High	Regional Science Research Council - partnerships of HEI with RDAs supporting research cooperation	No evidence provided

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21	University spin-off policies and economic development in Less successful regions: Learning from two decades of policy practice	Paul Benneworth; David Charles (2005), European Planning Studies, Volume 13, Issue 4 June 2005 , pages 537 - 557	North East, UK /	Low Med-High	Strategy for Change including R&D centres of excellence and VC funding scheme	Number of spin-offs is small; helped attract more venture capital and helped build networks between universities and companies.
			Overijssel, NL	Low Med-High	Food Innovation Network linking university with food sector	Improve linkages of traditional food sector with university.
22	New Economic Impulses in Old Industrial Regions: The Case of the University of Twente,	Benneworth, P., Hospers, G-J., Jongbloed, B., (2006), paper presented to the “Dutch-German Applied Economics Annual Seminar” the Rothenberge Estate, the University of Muenster, Germany, 8th-9th December 2006-03-31	Twente, NL	Low Med-High	Support university for cluster development in high tech sectors. Technology centre, incubation, seed fund	Gradual move towards a modern technopole. R&D expenditure more than twice the national average. Still disconnected from large part of the economy that remains in low tech sectors
23	Putting Constructed Regional Advantage into Swedish Practice	Coenen L, Moodysson J, (2009), EUROPEAN PLANNING STUDIES Volume: 17 Issue: 4 Pages: 587-604	Skania Region, Sweden	Low High	Food Innovation at Interfaces. Upgrading food industry through technology partnerships with university	No conclusions on impact
<b>Innovation Finance</b>						

	<b>Title</b>	<b>Author/Journal</b>	<b>Region</b>	<b>Autonomy/ Innovation level</b>	<b>Intervention</b>	<b>Main conclusions + impacts reported (if available)</b>
24	New Approaches to Innovation Policy: Some Norwegian Examples	ISAKSEN, A., REMOE, S. (2001) " <i>New approaches to innovation policy: some Norwegian examples</i> " European Planning Studies, Vol. 9, No 3.	Northern Norway, NO	Low Average	New Technology Programme: Direct financial support for innovation project + Advice	75% of SMEs supported from 1993 to 1996 reported that further R&D activity had either been initiated or planned. In addition, approximately 35% of SMEs had further modified or improved products or processes developed in 'NT projects' The majority of firms reported 6–10% increases in productivity Almost half of the supported SMEs were involved in some form of spin-off during the second phase of the programme.
25	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F.,(eds.), Edward Elga	Upper Austria, AU	Very High Med-High	Regional innovation Premium: Finance for innovative projects	Stimulate cooperation and interaction
26	Assessment of Government Funding of Business Angel Networks in Flanders	Collewaert V, Manigart S, Aernoudt R (2010), REGIONAL STUDIES, Volume: 44,Issue: 1 Pages: 119-130	Flanders, BE	Very High Med-High	business angels network	More value added and job creation in BAN-backed companies than in non-BA-backed companies, BANs reduce information and financing problems of entrepreneurial companies. The programme increases the supply of funds to entrepreneurial companies,

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						rather than crowding out the private sector.
27	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F.,(eds.), Edward Elga	Wallonia, BE	Very High Med-High	Interest free revolving loans	Strengthen firms innovative capacity
28	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F., (eds.), Edward Elga	Lombardy, IT	High Med-High	Regional law 35/1996 Finance for innovative projects/processes	Limited added value recorded
<b>Technology centres/SME services</b>						
29	New Approaches to Innovation Policy: Some Norwegian Examples	ISAKSEN, A., REMOE, S. (2001) " <i>New approaches to innovation policy: some Norwegian examples</i> " European Planning Studies, Vol. 9, No 3.	South eastern Norway	Low Med-High	Technology/knowledge centres to support U-I cooperation	Increased number of contracts with local SMEs and mobilization of college staff and student projects. Changed attitudes both in the local business community and in the colleges.
30	Policy Support for the Diffusion of Innovation among SMEs: An Evaluation Study in the Spanish Region of	Diaz-Puente J, Cazorla A, De los Rios I (2009), EUROPEAN PLANNING STUDIES, Volume: 17 Issue: 3,	Madrid, ES	High Med- High	Technology diffusion centres	Influenced investment in innovation in 24% of their target firms.

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	Madrid	Pages: 365-387				
31	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F.,(eds.), Edward Elga	Wallonia, BE	Very High Med-High	Technology and Innovation Manager: Innovation managers in SMEs	Enhance approach/investment towards innovation
32	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F., (eds.), Edward Elga	Valencia, ES	High Average	Technological Institutes: Technology support/adoption/introduction services to firms in specific sectors	Strengthen innovation capacity and performance of firms Diffuse innovation related information Induce cooperation
33	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F.,(eds.), Edward Elga	Upper Austria, AU	Very High Med-High	Technology centres:	Limited use of technology services, mainly from large firms. Limited spill over effects

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34	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F.,(eds.), Edward Elga	Northern Norway, NO	Medium Average	RUSH programme : Technology centres supporting university-industry cooperation	Increase in R&D activity and product innovation recorded, Researcher mobility, Support in diversification
35	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F (eds.), Edward Elgar	London, UK	Low Med-High	Technology centres/technology services to firms in focused sectors	Support technology adoption
36	Applying Internet technology to manufacturing SMEs in the UK North East region - barriers and opportunities	Marasini R, Ions K, Hamilton I, Ahmad M, (2004), Advances in e-engineering and digital enterprise technology-i, proceedings, Pp. 83-92	North East, UK	Medium Med-High	ICT support centre for SMEs	Not available
<b>R&amp;D cooperation support</b>						
39	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F., (eds.), Edward Elga	Lombardy	High Med- High	grants for R&D	Not available

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40	Innovation policies for SMEs: an overview of policy instruments	G Garofoli, B Musyck (2003), in Regional innovation policy for small medium enterprises, Asheim, B., Isaksen, A., Naulawers, C., Todtling, F.,(eds.), Edward Elga	Northern Norway, NO	Medium Average	NT programme: Financial support for R&D cooperation + Advisory services	Support coordination and cooperation among SMEs and R&D centres Strengthen firms' innovative capacity
41	Regional Technology Initiatives: Some Insights from the English Regions	Ian Vickers, David North European Planning Studies, Volume 8, Issue 3 June 2000 , pages 301 - 318	12 UK regions	Low	RTIs: Technical/innovation support to SMEs through university-industry collaboration projects (regional technology centres)	No evidence provided.
42	Creating Critical Mass of Research Excellence in the Region: The Case of Scottish Research Pooling Initiatives	Kitagawa, F. (2009), Creating critical mass of research excellence in the region: the case of Scottish research pooling initiatives", <i>European Planning Studies</i> , Vol. 17 No.3, pp.487-95	Scotland, UK	Very High Med-High	Support joint R&D among universities. Strengthen R&D base	Evidence of increased R&D activity, attraction of international students and researchers
<b>Science parks/incubators</b>						
43	The role of science parks and business incubators in converging	Tiago Ratinho, Elsa Henriques (2010), Technovation, Volume	Portuguese regions	Low Low to Med-Low	Science parks/incubators	No evidence

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	countries: Evidence from Portugal	30, Issue 4, Pages 278-290				
44	Specialization as strategy for business incubators: An assessment of the Central German Multimedia Center	Michael Schwartz and Christoph Hornycha (2008), Technovation Volume 28, Issue 7, Pages 436-449	Halle - East Saxony	very high Average	business incubator	Positive assessment of support to firms No evidence of broader impact besides image boosting
<b>Regional innovation strategy/governance</b>						
45	Leading Innovation – Building effective regional coalitions for innovation	Paul Benneworth (2007), NESTA Research report	Across Europe (11 regions)	Multiple Mid-Low to High	Innovation leadership	Success stories of developing regional innovation strategies
46	EU Regional Innovation Strategies: Regional Experimentalism in Practice?	Henderson, D, (2000), European Urban and Regional Studies,	Wales, UK	Medium Med-Low	Regional technology plan – Regional innovation strategy formulation	Not available
47	Policies to stimulate regional innovation capabilities via university-industry collaboration: an analysis and an assessment	Van Looy B, Debackere K, Andries P, (2003), R & D MANAGEMENT, Volume:33, Issue: 2, Pages: 209-229	Multiple	-	Regional innovation strategies	Not available
<b>Other tools</b>						
48	Energy regions: The transformative power of regional discourses on socio-technical futures	Philipp Späth, Harald Rohrer (2010), Research Policy, Volume 39, Issue 4, Pages 449-	Murau, Upper Austria, AU	Very high Med-High	Energy region project developing framework and setting targets for	Substantial redirection of energy systems towards greater sustainability. Impact on other regions by imitation

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		458			energy efficiency in projects and services	
49	Regional foods and rural development: The role of product qualification	Journal of Rural Studies Volume 23, Issue 1, January 2007, Pages 12- 22	Various rural regions	Multiple Multiple	promote food qualification for rural development	Depends on homogeneity of production - possible conflicts, free ride of large units, loss of distinctiveness
50	Don't believe the hype: Municipal promotion strategies for the Creative Industries The free Hanseatic city of Bremen as an example	Dirksmeier P, (2009), Volume: 45 Issue: 4 Pages: 37-45	Bremen, DE	Very high Med-High	support for creative industries	Not available
51	Counting on Creativity	Twomlow, J., Brownridge, K.,(2007) Perfect Moment	Cornwall, UK	Low Med-High	support for creative industries	29% turnover growth in the creative sector between 2000 and 2004, growth in Gross Value Added of 34%, compared with 7% nationally, an increase in employment of 19% and an increase in the number of businesses by 23%.
<b>Relevant sources identified but with no access to document</b>						
52	UniverCities: Innovation and Social Capital in Greater Manchester	Garcia, B.,	North West, UK	Low Med-High	knowledge city strategy	Not available
53	Knowledge-based dynamics of regional development: the case of Basilicata region	Lerro A, Schiuma G, (2009), Journal of knowledge management, Volume: 13 Issue: 5,	Basilicata, IT	Medium Med-Low	knowledge based strategy	Not available

	<b>Title</b>	<b>Author/Journal</b>	<b>Region</b>	<b>Autonomy/ Innovation level</b>	<b>Intervention</b>	<b>Main conclusions + impacts reported (if available)</b>
		Pages: 287-300				
54	Knowledge Networks in an Uncompetitive Region: SME Innovation and Growth	Huggins R, Johnston A, (2009), GROWTH AND CHANGE, Volume: 40 , Issue: 2, Pages: 227-259	Yorkshire and the Humber, UK	Low Med-High	knowledge networks support	Not available
55	Local innovation support in Scotland: policy lessons from Glasgow	A.H. McPherson and Sean M. McDonald, (2005), International Journal of Foresight and Innovation Policy, Volume 2, Number 1, Pages: 35 - 56	Scotland, UK	Very high Very high	Knowledge based development strategy	Not available