Strategic Evaluation on Innovation and the Knowledge Based Economy in relation to the Structural and Cohesion Funds, for the programming period 2007-2013

Contract n° 2005 CE.16.0.AT.015

A report to:

The European Commission
Directorate-General Regional Policy
Evaluation and additionality

Country Report: SWEDEN

Version: Final

Report produced by:
Tomas Åström
Karin Eduards
Henry Varga
Henrik Segerpalm

TECHNOPOLIS

In association with

ISMERI EUROPA

LACAVE, ALLEMAND & ASSOCIES CONSULTANTS

LOGO TECH Innovation & Development

7 July 2006

Legal Notice

Neither the European Commission, nor any person action on behalf of the Commission is responsible for the use which might be made of the following information.

The views of this study are those of the authors and do not necessarily reflect the policies of the European Commission.

CONTENTS

Executive Summary

Sweden is a highly advanced knowledge-based economy with a relatively large industry compared to similar economies. Internationalisation has progressed far due to a handful of Swedish-based multinational corporations and investments of foreign corporations. Sweden has a world-leading business environment, a well developed and reasonably successful innovation system, one of the highest overall R&D expenditures in the world and a well-educated population. Sweden's main challenge is to maintain its high standards and to successfully adapt to globalisation. To stay ahead, Sweden needs to ensure that its research and education system remains world-class, and needs to address the challenges in the "Swedish paradox"; the inadequate return on public investments in R&D. Sweden needs to promote spin-offs and start-ups and to support SMEs, especially in the creation and growth of high-tech SMEs through dissemination of research results and in providing SME access to research on their own terms. Moreover, Sweden needs to cultivate an entrepreneurship culture, improve economical incentives for innovators and entrepreneurs, and to improve conditions for innovation and commercialisation processes.

Although the innovation system is reasonably successful, there are some notable deficiencies in the institutional context, including:

- Scant synchronisation between Ministries and sector agencies, meaning that there is little coordination of innovation and knowledge measures
- Public initiatives and organisations supporting innovators and entrepreneurs are numerous and overlap each other, leading to a fragmented and inefficient system
- Inefficient collaboration between R&D performers and industry, since R&D focus is on technology push rather than on market pull
- Insufficient access to seed and long-term venture capital

With the exception of the oft-questioned doctrine of the universities being the main providers of applied R&D and a suffocating tax burden, the policy mix is on the whole well-considered and – to a significant extent – address the disparities and needs pinpointed in this report and the government's innovation strategy provides an appropriate framework for future policy interventions. However, the government's commitment to actually push through with the necessary reforms is not obvious. On the whole, the private sector is unsatisfied with the lack of concrete support in terms of innovation infrastructure and legislation. Although official rhetoric often points in the right direction, there is little concrete evidence of actual conviction in terms of facilitating innovation processes or improving conditions for entrepreneurs, not least from a taxation point of view.

Overall, the financial weight of SF interventions in favour of innovation and knowledge creation is marginal compared to national investments. Despite this, SF interventions provide a useful complement to national initiatives in funding other types of measures than national programmes. SF programmes focus on maintaining job opportunities and creation of new as a means of supporting structural and social change in the regions, and do not consider a holistic national perspective. Consequently, interventions focus on meeting relatively basic regional needs. Interventions in favour of innovation measures largely focus on entrepreneurial activities, creation of new businesses and innovative actions focused on product development, all with the ambition

of maintaining or creating jobs. Interventions in favour of knowledge creation generally have very diverse aims, such as coordination of educational efforts and development of educational infrastructure, such as regional universities. To date, programmes and measures in favour of innovation and knowledge creation have been successful, but the extent of their contribution to regional development cannot be authoritatively assessed.

The innovation potential of Sweden as a whole is very good, but regional differences are substantial, and throughout most of the country the lack of entrepreneurship tradition is an important limiting factor in unleashing innovation potential. The big-city regions all have excellent innovation potential and central Sweden has very good potential. Southeastern Sweden has fair innovation potential, whereas Northern Sweden overall has low innovation potential.

In terms of strategic orientations, the policy recommendations of this report have three foci. The first is on facilitating technology transfer and collaboration between R&D providers and industry, in particular SMEs, through both innovative and traditional funding instruments and to focus such interventions on genuine industry needs rather than on technology transfer. The second focus is to launch and capitalise a professionally managed fund for seed and venture capital willing to take risks greater than national organisations do. The third focus is to support mission-oriented clusters with emphasis on cluster management activities, infrastructure investments and corollary cluster activities, such as joint export ventures and writing of proposals for additional support (e.g. from FP7 and CIP). All of the strategic guidelines would harmonise very well with upcoming FP7 and CIP measures. The operational guidelines proposed are to ensure strategic planning and professionalize national management of SF interventions, to concentrate interventions to private enterprises, in particular SMEs, and to not prioritise SF interventions to any specific region(s).

There is a potential conflict between the not-yet public Strategic Reference Framework and the recommendation to make no regional priorities, since the government seeks to align the Strategic Reference Framework with its national regional development policy that aims to ensure well-functioning and sustainable regions throughout the country. In contrast, the remainder of the recommendations agree very well with the government's priories. Given Sweden's excellent overall absorption capacity during the present programming period, it is assumed that at least the same order of total interventions could be absorbed also during the upcoming period. However, it is proposed that RTDI-related interventions are increased to at least 40% of the total.

1 Introduction

In March 2000, the EU Heads of State and government launched an ambitious political initiative for the European Union to become "the most competitive, dynamic, knowledge-based economy by year 2010". The agenda, which has become known as the 'Lisbon Strategy', has included a broad range of policies and regulatory measures to achieve this goal.

At the 2005 Spring Council of European Union, Heads of State and government concluded that all appropriate national and Community resources, including those of Cohesion Policy, should be mobilised in order to renew the basis of Europe's competitiveness, increase its growth potential and its productivity and strengthen social cohesion, placing the main emphasis on knowledge, innovation and the optimisation of human capital. In short, the Council recognised that while some progress has been made since 2000 in moving towards the goals enshrined in the Lisbon Strategy, there remains a need to create "a new partnership for growth and jobs".[1]

In launching the discussion on the priorities for the new generation of cohesion policy programmes, the Commission published on 6 July 2005 draft Community Strategic Guidelines entitled "Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013". One of the specific guidelines is to improve the knowledge and innovation for growth. More specific areas of interventions, which are proposed by the Commission, include improve and increase investment in RTD, facilitate innovation and promote entrepreneurship, promote the information society for all, and improve access to finance.[2]

Innovation is an important factor in releasing the potential of the Lisbon agenda. The knowledge captured in new technologies and processes can drive growth and competitiveness and create new jobs. But knowledge must be treated as part of a wider framework in which businesses grow and operate. Developing a knowledge-based economy requires adequate levels of investment in R&D, education and ICT, as well as creating a favourable environment for innovation.

Less developed areas of the Union are also confronted with this new competitiveness challenge. Increasing cohesion leads to improvements in living standards and the reduction of economic and social disparities, which depend to an important extent on increases in productivity. Increasing competitiveness implies economic change through the introduction of new technologies and new methods of production as well as the development of new skills. Innovation is at the heart of this process. Technological and organisational change and new demands generated by rising income levels and factors which create new economic opportunities and therefore, contribute to the growth potential of these countries.

---

1 Communication to the Spring European Council (2005) "Working together for growth and jobs: A new start for the Lisbon Strategy", COM(2005) 141. Available at: http://www.europa.eu.int/growthandjobs/key/index_en.htm.

2 Communication from the Commission (2005) "Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013", COM(2005) 0299. Available at: http://www.europa.eu.int/comm/regional_policy/sources/docoffic/2007/osc/index_en.htm.

The Structural Funds are the main Community instruments to promote economic and social cohesion. In past and current programmes, they have contributed to enhancing the research potential and innovation in businesses and to developing the information society, particularly in the less developed areas. Cohesion policy has also promoted the development of regional innovation strategies and other similar initiatives in the field of the information society.

The overall objective of the strategic evaluation study, as set out in the terms of reference, is that the study should provide conclusions and recommendations for the future of Structural Fund and Cohesion policy. In particular, the Strategic Evaluation will be used to prepare the negotiations with the Member States for 2007-13, to prepare the next operational programmes and to provide input into the 4th Economic and Social Cohesion Report.

In line with the tender specifications, this country report addresses the following issues:

- An analysis of the current situation in the field of innovation and the knowledge-based economy at national and regional level. For the national level, performance is compared to the average performance for the EU25 Member States plus Romania and Bulgaria; and at regional level, where possible given available statistics, compared to a typology of EU regions;
- Lessons from the past and current experience of implementing innovation and knowledge economy measures in the Structural Funds, both in terms of priorities and strategic approaches; as well as in terms of operational implementation;
- Main needs and potential for innovation in the eligible regions drawing on available studies, strategy development and future and foresight studies; and
- Recommendations on main investment priorities for Structural Funds over the programming period 2007-2013 and their implications for regional development.

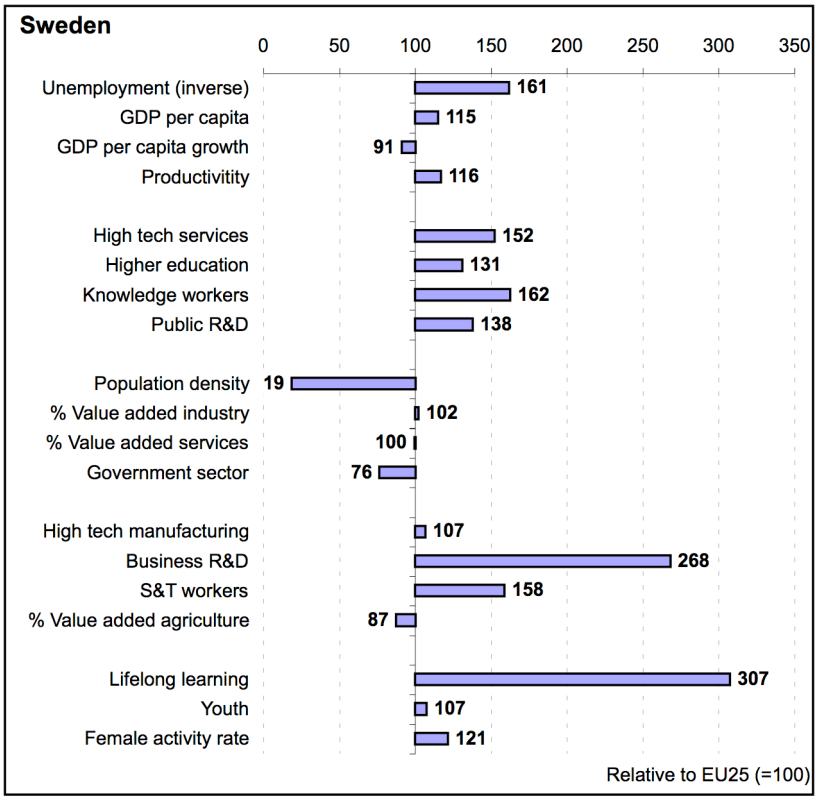
2 Investing in innovation and knowledge: a comparative overview of regional performance

This section provides a synthetic overview of the relative performance of the country, and where relevant main regions, with respect to the EU25 average for a number of selected key structural indicators of innovation and knowledge. The analysis aims to identify **main disparities and needs** at national, and wherever possible, regional level with a view to supporting the definition of priorities for future Structural Funds interventions (cf. Sections 5 and 6).

2.1 Country overview: innovation and the knowledge economy

Exhibit 1 provides a snapshot of the relative position of Sweden compared to the EU25 average for a series of key knowledge economy indicators.

Exhibit 1: Relative country performance for key knowledge economy indicators



Source: Calculations of MERIT based on available Eurostat and national data from 2002-2003 depending on indicator. Detailed definitions and data for each indicator are provided in Appendix B.

Exhibit 1 illustrates that Sweden is ahead of EU25 for a majority of indicators or even far ahead, e.g. for business R&D and lifelong learning. However, Sweden is loosing momentum in a number of indicators – albeit from a high level[3]. The decrease in domestic activities among a handful of dominating multi-national corporations (MNCs) could be an important factor, since they are one of the backbones of the economy.

[3] "2005 European Innovation Scoreboard - Sweden", European Commission, 2005.

Also, value added from high-tech companies remain, from a Swedish perspective, low or is declining.

Sweden is a small, open and advanced economy with one of the most well-developed innovation systems in the world. In terms of size, it is the third largest country in the EU with a population of only nine million. About 78% of the population lives in the south, on one third of the total area. In 2004, GDP growth was 3.7% compared to 2.3% for EU25. Growth was mainly driven by exports (40% of GDP), while competitiveness was based on improvements in efficiency. Recently growth has also been driven by increased domestic demand.

While the economy has performed relatively well, the unemployment level remains a problem, even though it at 6.3% is below the 9% EU25 average for 2004; this is further augmented by a decrease in total employment (-0.2% in 2003 compared to +0.3% for EU25). Figures from 2006 indicate a positive trend, but the number of people in employment programmes is increasing. Employment in medium-high-tech and high-tech manufacturing is around EU average, while employment in high-tech services is well above average, albeit with a negative trend[4]. The relatively high level of employment in high-tech services and in high-tech manufacturing has stagnated or declined. Companies like ABB, Electrolux, TeliaSonera, Ericsson, Volvo, Saab and Scania have decreased the number of employees in Sweden by almost 115 000 between 1982 and 2004[5].

Sweden is well above the Lisbon target for R&D expenditure. Although in recent years the R&D expenditure has decreased (2001: 4.27%, 2003: 3.98%, 2004: 3.74%), spending by industry and business is still among the highest in the world. The decrease can partly be explained by relatively strong economic growth and reduced use of external consultants for in-house R&D. The government target for public funding of R&D is 1% of GDP. There is no overall target for R&D expenditure, but the government's aim is to boost knowledge and skills in the business sector in order to stimulate innovation, growth and modernisation. This is done in cooperation and in consensus with trade unions, industry and government; together they have decided to focus on six key industry sectors representing around 80% of all business R&D.

A distinctive feature of Swedish R&D is its dependence on a handful of MNCs, mainly within pharmaceuticals, automotive products as well as electronic and telecom products. The 20 most R&D intensive companies contribute 68% of total industry and business R&D[6]. Due to globalisation, these MNCs have relocated an increasing part of their R&D closer to markets. Therefore, a main challenge for Sweden is how to respond to the effects of globalisation on domestic R&D and how to remain a global leader. Further, Sweden has the highest share of R&D intensity in affiliates under foreign control and among the lowest shares of SMEs performing R&D (13.1% compared to 22.4% for EU25)[7]. Industry and business R&D is highly concentrated to the big-city counties (approximately 75%), thus potentially creating structural problems.

---

4 Ibid.

5 "European Trend Chart on Innovation, Annual Innovation Policy Trends and Appraisal Report, Sweden, 2004-2005", European Commission, 2005.

6 "Forskning och utveckling i Sverige 2003", Statistics Sweden.

7 "Key Figures 2005, Towards a European Research Area – Science, Technology and Innovation", European Commission, 2005.

In recent years there has been a growing policy debate on the state of the Swedish innovation system. The cause of this debate was the high investment in R&D, particularly public, with low pay-off in terms of economic growth (see above regarding unemployment), which has led to a discussion on the so-called "Swedish paradox", although also referred to as a "European paradox". Some of the arguments are that the Swedish innovation system is ineffective and the interplay between university, companies and politics is too weak. This has inspired government policy changes in recent years, as further discussed in Section 3.

With regard to human resources, Swedish performance is relatively strong. The population is well-educated and public expenditure on education is among the highest in EU25. Sweden generates among the highest shares of science and engineering (S&E) graduates (30.5% of total degrees in 2003) and the growth rate of 3.3% for 1998-2003 is also above EU25 average[8]. However, women are underrepresented in research when compared to the gender relation for all S&E graduates. Moreover, Sweden faces some challenges regarding the supply of researchers for the future, since universities are facing a generation shift. Some 45% of teaching and research staff at universities retire within the next 15 years[9]. To meet the growing need for trained researchers, the government has committed new resources to postgraduate education and to university positions for young researchers. The appropriations for research and postgraduate education are further increased during 2005-2008. Sweden also has a large number of well-educated immigrants that work in unqualified positions, especially in the big-city regions, consequently leading to inefficient use of available human capital. Further, well-educated individuals with immigrant background born in Sweden or abroad have a greater tendency to seek employment outside Sweden and also have less propensity to return to Sweden, compared to native-born Swedes, thus translating to a permanent loss of competence.

Sweden has a relatively large industrial sector compared to similar economies. EPO patent applications from the manufacturing industry 1997-2000 shows that Sweden has a specialisation in base metals, fabricated metal products, radio, television and communication equipment, and in wood, paper, printing and publishing[10]. Sweden is well above EU25 average in terms of new EPO and USPTO patens, but the trend for EPO patents is negative. One explanation may be a change in patenting strategy for the MNCs. In terms of exports of high-tech products the trend is negative and at the bottom of EU25 (-5.1% of world market share compared to 2.7% in 1997-2002)[11].

Having a well-developed, reasonably successful and R&D-intensive innovation system, Sweden's problem is how to maintain its leading position. The Swedish innovation system, with its dependency on a few MNCs that have been quick to adapt to globalisation, has revealed several weaknesses and shown a need for change. Recent policy documents indicates awareness and willingness to meet these challenges and the targets are ambitious. One of the key challenges that Sweden needs to address is how to promote exploitation of RTDI through spin-offs and start-ups, and how to fa-

---

8 Ibid.

9 Government bill (2004/05:80)

10 "Key Figures 2005, Towards a European Research Area – Science, Technology and Innovation", European Commission, 2005.

11 Ibid.

cilitate an increase in the number of high-tech SMEs that perform R&D, so as to counterbalance the globalisation of domestic MNCs.

2.2 Regional disparities and recent trends

In order to analyse and describe the knowledge economies at regional level in the EU, an approach to reduce and condense all relevant statistical information available for a majority of regions was adopted. The approach involved first reducing the information from a list of selected variables into a small number of factors by means of factor analysis. These factors are:

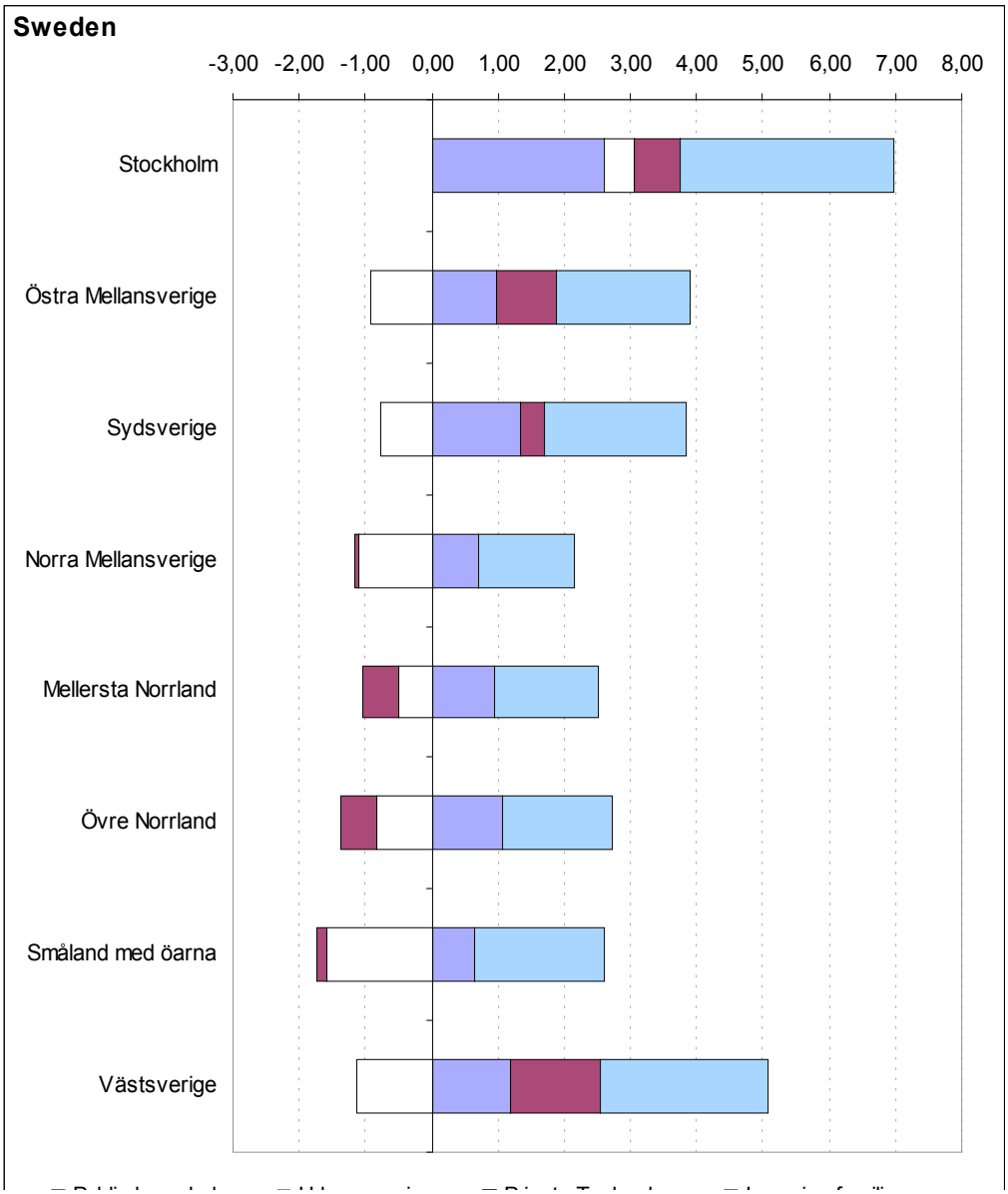
- Public Knowledge (F1): human resources in science and technology combined with public R&D expenditures and employment in knowledge intensive services are the most important or common variables in this factor. Regions with large universities will rank high on this factor.
- Urban Services (F2): The most important variables for this factor are value-added share of services, employment in government administrations and population density. A key observation is that academic centres do not necessary co-locate with administration centres.
- Private Technology (F3) This factor is most strongly influenced by business R&D, occupation in S&T activities, and employment in high- and medium-high-tech manufacturing industries.
- Learning Families (F4). The most important variable in this factor is the share of the population below the age of 10. The Learning Families factor could also be interpreted as an institutional factor indicating a child-, learning- and participation-friendly environment, or even a 'knowledge-society lifestyle' based on behavioral norms and values that are beneficial to a knowledge economy.

In a second step, the 200-plus EU27 regions were grouped into 11 types of regions displaying similar characteristics by means of a cluster analysis (see Appendix A). In the case of Sweden, the eight regions are grouped as follows (cf. Exhibit 2):

- **Stockholm, Östra Mellansverige, Sydsverige** and **Västsverige** fall into the "**Nordic High-tech Learning**" cluster. The Nordic version of the learning regions is typically strong in the Learning Family factor, but this type also has by far the highest business R&D intensity. In contrast to the popular picture of the Nordic countries, the size of the government administration is the lowest of all the region types. The low score on Urban Services is also due to the low population density. A rather unique feature of this type of regional knowledge economy is the combined strength in both Public Knowledge and Private Technology factors.
- **Norra Mellansverige, Mellersta Norrland, Övre Norrland** and **Småland med öarna** fall into the "**Learning**" cluster. The Learning regions are first of all characterised by the high score for the Learning Families factor, and the three main components of this factor: life-long-learning, youth and female activity rate. For the other factors the regions are close to the regional average. On average, unemployment is the lowest compared to other EU regions. Employment in the government sector is limited. GDP per capita is relatively high. The regions are located in Austria, Ireland, the Netherlands, Sweden and the UK. There are many similarities with the Nordic High-tech Learning regions, but the business sector in the Nordic version invests more in R&D.

Looking at Exhibits 2 and 3, Stockholm distinguishes it self and is the only region with above average for "urban services". The regions in the "Nordic High-tech Learning" cluster are the only ones with above average in "private technology".

Exhibit 2: Regional factor scores per region



Source: MERIT. The bars are stapled factor-scores showing the deviation (1=standard deviation) per factor from the average of 215 EU regions (0.00). The longer the bar, the bigger is deviation. Detailed regional scorecards can be found in Appendix B.

Much of the socio-economic activity of Sweden, which is dominated by the private sector, is concentrated in and around Stockholm, Göteborg and Malmö (the regions of Stockholm, Västsverige and Sydsverige). The GDP per capita, GDP per capita growth and productivity are the highest of all regions, as is the population increase (cf. Exhibit 3). Over 93% of Business R&D expenditure takes place in the "Nordic High-tech learning" cluster and for R&D in higher education it is over 84%[12]. Regionally funded public R&D is low in all Swedish regions, as most of it is managed at national

[12] Swedish statistics 2001, in man-years.

level. Since the beginning of the millennium, the 'Learning' cluster regions have experienced an increase in population again (cf. Exhibit 3). In the 'non-big-city' regions, only around 50% of the population stays in the region after completing their education and many move to Stockholm. Exhibit 3 shows a decrease in unemployment for the period, which is also confirmed by recent national data (although not taking into account the increase in 2003 and 2004); but the number of people in employment programmes has increased in recent years. Compared to Exhibit 3, national figures show that the number of university students is increasing across the country, which is in line with government policy.

Exhibit 3: Recent trends per region in key indicators

		Unemployment	Per capita GDP	Industry share	Agriculture share	Population density	Tertiary education	R&D intensity
		1996-2003	1996-2002	1996-2002	1996-2002	1996-2002	1999-2002	1996-2002
		% ch.	% ch.	% ch.	% ch.	% ch.	% ch.	% ch.
EU25		--	--	--	--	--	--	--
Sweden		-3,90	4,34	-1,71	-0,59	0,93	-2,02	0,92
Stockholm	SE01	-2,60	5,06	-1,49	-0,06	5,73	-2,97	--
Östra Mellansverige	SE02	-3,70	3,96	-1,54	-0,51	0,00	-2,67	--
Sydsverige	SE04	-3,50	4,45	-1,34	-0,42	1,87	-2,54	--
Norra Mellansverige	SE06	-3,70	3,32	-1,38	-0,80	-3,73	-2,45	--
Mellersta Norrland	SE07	-6,20	3,43	-1,03	-0,24	-5,45	-0,82	--
Övre Norrland	SE08	-5,30	2,97	0,12	-0,76	-2,94	-3,86	--
Småland med öarna	SE09	-3,60	3,55	-1,87	-1,27	-1,23	-0,92	--
Västsverige	SE0A	-4,80	4,50	-0,92	-0,63	1,51	-1,35	--

Source: MERIT based on Eurostat data for period indicated.

Stockholm is the only region that consists of only one county, representing a mere 1.5% of Swedish territory and having a population of 1.9 million, making it by far the most densely populated area (cf. Exhibit 3). A population density well above cluster average and a high level of added value services explain why Stockholm is the only Swedish region performing above EU average in "urban services". The capital region is Sweden's major service centre with the smallest contribution from value added industry and high-tech manufacturing, but it has the second highest Business R&D expenditure (4.37%). Stockholm has a well-educated and skilled population with the highest scores in S&T workers, higher education and knowledge workers. "Public knowledge" is also one of its strongest clusters and it is the only Swedish region to score better than cluster factor average. Stockholm is home to seven out of 32 universities and university colleges and almost 30% of all postgraduate students (2004). In 2004, every third newly started enterprise was established in the region, with a notable emphasis on the service sector.

Västsverige and **Sydsverige** include the second and third largest cities, but with large rural areas the socio-economic structures are different compared to Stockholm. Sydsverige is Sweden's second most densely populated region and has an important agricultural sector, and food and chemical/pharmaceutical industry with the third highest Business R&D expenditure (3.19%). Västsverige is Sweden's third most densely populated region with an important industry sector; more than half of the nation's automotive industry located in the region. The region also has the highest level of Business R&D (5.19%) and high-tech manufacturing, and is the best performing Swedish region in "private technology". For both regions, value-added share industry

is around cluster average, while value added services are the strongest behind Stockholm. Both regions perform well in "public knowledge", but slightly below cluster average. The regions are home to ten universities and university colleges with around one third of all postgraduate students. In 2004, the two regions counted for 28% of all newly started enterprises.

Östra Mellansverige consists of five counties with different economic structures and it performs fourth in GDP per capita growth (cf. Exhibit 3). Uppsala has a strong tradition in education and research and has a well-developed service sector, while the other counties have a strong history in industry and manufacturing, and are trying to adjust to the effects of globalisation. This is also well reflected in the miscellaneous scores where the best performing cluster factor is "private technology" (second among Swedish regions) and third in value added industry, while the region scores relatively poorly in "public knowledge" and "urban services". This would imply that the region is more 'manufacture' than 'service' oriented. This inconsistency is also clear when looking at the distribution of R&D; 16% of university research is carried out in Uppsala alone and over 60% of the region's postgraduate students, which account for 23.1% of the nation's total, are located in Uppsala. Further, Uppsala has one of the nation's highest levels of higher education access in relation to its population.

Småland med öarna is a region of SMEs. The local market is smaller, the educational level is normally lower and the service sector is less developed. The region is characterized by a strong culture of business and entrepreneurship, great dynamics in terms of large number of started and failed enterprises, well-developed business networks and a long tradition in a few types of business and industry activities; one of Sweden's most well known MNCs has its origin in the region. These facts are also reflected in the cluster factors scores which are the lowest values in "public knowledge" and "urban services". The low score in S&T workers further underpins this. Considering its population, the region has inadequate access to higher education. There are four universities and university colleges in the region, but only around 2% of postgraduate students. Compared to national average, the region has the highest value-added share industry and third highest high-tech manufacturing, while business R&D is among the lowest. However, one of the largest increases in employment is expected in the region, and between 2003 and 2004 there has been a considerable increase in newly started enterprises; in Jönköping county the majority has taken place in the service sector.

Norra Mellansverige, **Mellersta Norrland** and **Övre Norrland** represent over 70% of Sweden's territory but only 19% of the population, meaning they constitute one of the sparsest populated regions in the EU, a fact further augmented by most people living along the coast. The regions are especially rich on forests, minerals and hydroenergy. Performance is scattered and most scores are below national average, but the regions have a skilled workforce compared to cluster average. Services in Mellersta Norrland are considerably stronger than manufacturing and industry compared to the other regions. Scores for high-tech services and "urban services" are second highest in Sweden. Industry is strong in Norra Mellansverige compared to the average, although Övre Norrland is the only region with a positive development in industry share (cf. Exhibit 3). Norra Mellansverige is the only region to perform above R&D cluster average, but well below national scores. "Private technology" is Norra Mellansverige's strongest cluster factor while for Övre Norrland it is "public knowledge".

Övre Norrland also scores relatively well in higher education and is the only region above cluster average. It has 2 universities and almost 10% of all active postgraduate students are located in the region, while the other two regions have 4 universities and university colleges but only 1.5% of postgraduate students.

2.3 Conclusions: innovation and knowledge performance

Exhibit 4: Summary of key disparities and needs per region

Region/group of regions	Key factors explaining disparity of performance (weaknesses)	Key needs in terms of innovation and the knowledge economy
Stockholm	• Much of research and innovation is concentrated to larger enterprises • Weak manufacturing industry • Human capital not fully exploited (immigrants and, to some extent, women)	• Stimulate Business R&D and innovation in SMEs • New sources of growth in innovation • Better use of human resources
Västsverige, Sydsverige	• Human capital not fully exploited (immigrants and, to some extent, women) • RTDI activities concentrated in and around larger cities • Strong dependency on few automotive enterprises (Västsverige) • Low regional public expenditure on R&D	• Stimulate Business R&D and innovation in SMEs • Increase public R&D investments with leveraging effects
Östra Mellansverige	• Human capital not fully exploited (immigrants and, to some extent, women) • Industrial structure and necessity to adapt to new economic realities	• Stimulate Business R&D and innovation in SMEs
Småland med öarna	• Under-developed service sector • Low Business R&D investment • Room for improvement in access to higher education • Sensitive sectoral composition including traditional industry	• Stimulate Business R&D and innovation in SMEs • Stimulate the creation of knowledge-based activities • Promote the service sector and high-value added activities
Norra Mellansverige, Mellersta Norrland, Övre Norrland	• Under-developed service sector • Low Business R&D investment • High dependency on public sector for employment • Low levels of higher value added activities in services • Losing well-educated people to big city regions • Industrial structure composition	• Promote research and innovation of regional excellence • Stimulate Business R&D and innovation in SMEs • Stimulate entrepreneurship

3 Innovation and knowledge: institutional context and policy mix at national and regional levels

Structural Fund support for innovation and knowledge is contingent on and seeks to strengthen the existing national (and/or regional) innovation system[13] in each Member State. In particular, institutional, legal and financial factors in the innovation system can limit the potential for certain types of intervention. Moreover, within the framework of the EU's "Lisbon objectives", Structural Fund interventions are expected to complement and provide added value to national (or regional) policy frameworks. In some Member States, Structural Fund interventions in favour of innovation and knowledge are marginal with respect to the national investment and policy effort, in others Structural Funds provide a main source of funding for such interventions. In both cases, there is a need to identify relevant national and EU policies, which can have an impact on decisions on funding priorities.

3.1 Institutional and legal framework for innovation and the knowledge economy

This section of the report appraises two broad factors that condition the potential for coordinated intervention of EU and national (regional) policies in favour of innovation and knowledge:

- The first concerns the organisational structures of public and semi-public bodies responsible for the design, implementation and monitoring of innovation and knowledge economy policies. In particular, the analysis considers the responsibilities for funding or managing specific types of measures liable to be considered for support under the Structural Funds;
- The second concerns the institutional, legal and financial frameworks, which condition the linkage of national (regional) financing with EU financing.

3.1.1 Organisational structure[14]

The Swedish organisational structure of public and semi-public bodies responsible for innovation and knowledge economy policies is illustrated in Exhibit 5.

General policy

General policy is formulated by the government and in particular by three ministries: **Ministry of Education, Research and Culture**[15], **Ministry of Defence** and **Ministry of Industry, Employment and Communications**[16]. A number of functions that in many other countries are carried out by ministries are in Sweden assumed by relatively independent government agencies, resulting in comparatively small ministries. In formulating policy, the government is supported by a **Research Policy Council**

[13] The network of organisations, individuals and institutions, located within or active within national or regional boundaries, that determine and shape the generation, diffusion and use of technology and other knowledge, which, in turn, explain the pattern, pace and rate of innovation and the economic success of innovation.

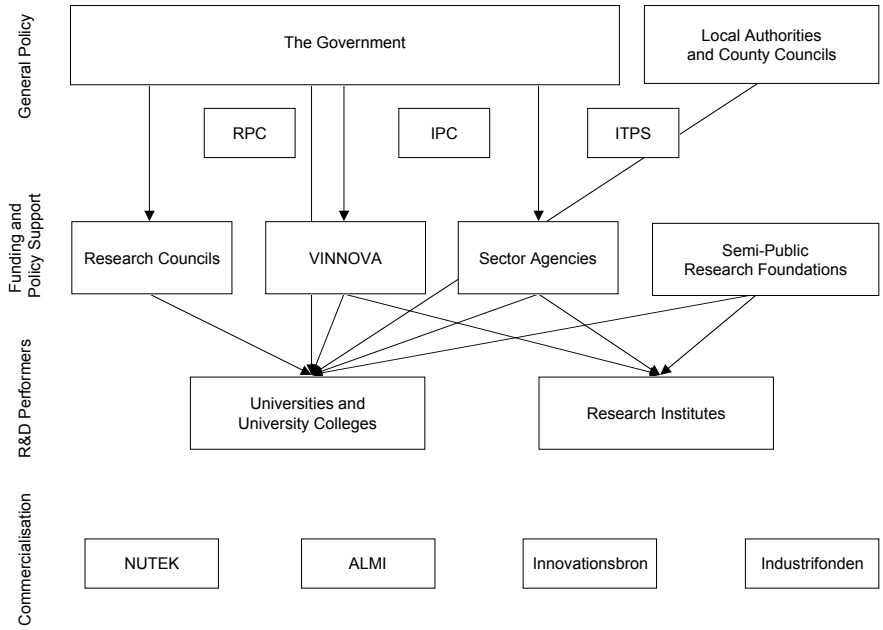
[14] This section is partly based on "European Trend Chart on Innovation, Annual Innovation Policy Trends and Appraisal Report, Sweden, 2004-2005", European Commission, 2005.

[15] Hereinafter referred to as Ministry of Education.

[16] Hereinafter referred to as Ministry of Industry.

(RPC), an **Innovation Policy Council (IPC)** and the **Institute for Growth Policy Studies (ITPS)**, but neither body has any formal authority meaning that they are reduced to advisory functions. On the regional level, policy is formulated in **Regional Growth Programmes (RTP)** engaging regional stakeholders. Funding is provided from public and private sources; in some regions, Structural Funds contribute a substantial portion of overall funding.

Exhibit 5: Organisational structure; arrows indicate main public and semi-public funding flows (abbreviations introduced in text). Private actors not shown



Funding and policy support

The Swedish government invests some 25 bln SEK (2.7 bln EUR) in R&D and six semi-public research foundations contribute another 1.5 bln SEK (0.17 bln EUR). Estimates of the contributions from local authorities and county councils vary significantly and range up to 7 bln SEK (~0.8 bln EUR); official statistical data are not available. Of the Swedish government's direct R&D investment, 56% goes to curiosity-driven research and 42% to mission-oriented R&D (20% to defence-related R&D, 22% to non-defence-related R&D). The clear majority of the investment in curiosity-driven research (11 bln SEK; 1.2 bln EUR) is transferred directly to universities and university colleges and the remainder is funnelled through three research councils. The 22% of the investment in mission-oriented R&D that is not directly defence-related is managed by a range of sector agencies, of which the **Swedish Governmental Agency for Innovation Systems (VINNOVA)** is the most important, allocating 5% of total government investment in R&D. VINNOVA's mission is to promote sustainable growth by funding R&D and developing effective innovation systems.

R&D performers

16 **universities** (to a limited extent supported by 16 university colleges) are not only responsible for curiosity-driven research, but they are also technically responsible for most of the mission-oriented R&D and related technology transfer. Approximately 30 mission-oriented **research institutes** account for a small proportion of the total R&D capacity, but they are nevertheless important intermediaries between research and in-

dustrial application, particularly for SMEs.

Commercialisation

There is a large number of publicly funded actors promoting entrepreneurship; the most important are the **Swedish Agency for Economic and Regional Growth (NUTEK)**, **ALMI Företagspartner (ALMI)**, **Innovationsbron ("The Innovation Bridge")** and **Industrifonden ("The Industry Fund")**. NUTEK promotes entrepreneurship, supports business development and aids in regional development. Innovationsbron aims to commercialise research-related ideas through business development and incubators as well as by providing seed funding. ALMI aims to stimulate growth and development for SMEs and innovators, provides venture capital and offers advice on business development. Industrifonden promotes innovative Swedish companies by investing equity capital or granting loans.

Exhibit 6 summarises the most important Swedish organisations per policy area.

3.1.2 Main weaknesses of innovation system

Lack of national coordination. There is little synchronisation between Ministries and sector agencies, meaning that there is essentially no coordination of innovation and knowledge measures. Public initiatives and organisations supporting innovators and entrepreneurs are numerous and often overlap each other. The overall picture is fragmented and inefficient; many of the initiatives and organisations devised to support innovators and entrepreneurs often cannot achieve critical mass.

Inefficient collaboration between R&D performers and industry. For over 50 years, the internationally unique Swedish research doctrine has dictated that the universities should be the main providers of both curiosity-driven and mission-oriented research services. However, the universities have proven incapable of fulfilling the intended function of intermediary between academic research and industrial exploitation and do not live up the needs of industry in terms of contract R&D. Moreover, public support of R&D favours curiosity-driven research at the expense of mission-oriented research. Funding priorities in favour of universities and curiosity-driven research have resulted in an institute sector that by international standards is weak, fragmented, small and under-funded. Despite their relatively modest collective size, the research institutes are nevertheless largely successful intermediaries between research and industrial application, particularly for SMEs, thus playing a vital role in the innovation system. However, the possibilities for the research institutes to participate in collaborative EU R&D projects are limited due to their low level of base funding that can be used for co-financing.

Lack of capital. Available seed and venture capital is by most accounts insufficient and the degree of risk accepted is generally rather low.

IPR ownership for university researchers. By law, Swedish university researchers have the sole right to their own inventions. This exception in the law has been the subject of ample debate, but remains in place also after a recent review and despite the criticism that it limits exploitation of university innovations. However, the individual may elect to give up this right in a specific project, which in practice is often the case in international projects, e.g. EU-funded collaborative research projects.

Exhibit 6: Main organisations per policy area.

Policy objectives	National (and/or regional) public authorities and agencies	Key private or non-profit organisations
Improving governance of innovation and knowledge policies	• ITPS • VINNOVA	• Confederation of Swedish Enterprise • Association of Swedish Engineering Industries • Federation of Private Enterprises • Royal Swedish Academy of Engineering Sciences (IVA)
Innovation friendly environment	• NUTEK • ALMI • Innovationsbron • Industrifonden • VINNOVA • Universities • Research institutes	• Confederation of Swedish Enterprise • Association of Swedish Engineering Industries • Federation of Private Enterprises • Knowledge Foundation (KKS)
Knowledge transfer and technology diffusion to enterprises	• Research institutes • Universities • University technology parks	• Industriella Utvecklingscentra (IUC) • Swedish Foundation for Strategic Research (SSF) • KKS • Wallenberg Foundations
Innovation poles and clusters	• VINNOVA • NUTEK	• CONNECT Sweden • KKS
Support to creation and growth of innovative enterprises	• VINNOVA • NUTEK • ALMI • Innovationsbron • Industrifonden • University technology parks	• CONNECT Sweden • IUC
Boosting applied research and product development	• VINNOVA	• KKS • Wallenberg Foundations

3.2 Policy mix assessment

This section provides a summary overview and analysis of the national policy mix in favour of innovation and knowledge in which the Structural Fund interventions take place. The analysis is conducted with respect to seven broad categories of objectives of innovation and knowledge policies (see Appendix C for an explanation of each category).

Measures identified per category of the policy objectives are then further subdivided in terms of the direct beneficiaries of funding (or legislative) action. To simplify, the report adopts three broad types of organisations as targets of policy intervention:

- Policies supporting academic and non-profit knowledge creating institutions;
- Policies supporting intermediary/bridging organisations involved in innovation support, technology transfer, innovation finance, etc.;
- Policies supporting directly innovation activities in private sector.

Exhibit 7 summarises the current policy mix at national level. A simplified coding system is used with intensity of support (political priority) for different policy areas and targets indicated by a colour coding system.

Exhibit 7: Policy mix for innovation and knowledge.

	Target of policy action		
Policy objectives	**Academic/non-profit knowledge institutions**	**Intermediaries/ bridging organisations**	**Private enterprises**
Improving governance of innovation and knowledge policies	• Swedish Technology Foresight projects	• Swedish Technology Foresight projects	• Swedish Technology Foresight projects
Innovation friendly environment	• Government research-related bills • Government innovation strategy • Regional growth programmes	• Government research-related bills • Government innovation strategy • Government commissioned inquiries • Regional growth programmes	• Government research-related bills • Government innovation strategy • Government commissioned inquiries • Industry sector-specific national strategy documents • Technology platforms for FP7 • Regional growth programmes
Knowledge transfer and technology diffusion to enterprises	• VINNOVA programmes • Government emphasis on universities' knowledge transfer task • Support programmes for university technology parks	• VINNOVA programmes	• VINNOVA programmes • Government emphasis on universities' knowledge-transfer task • Support programmes for university technology parks
Innovation poles and clusters	• Programmes by VINNOVA, NUTEK, SSF, KKS, research councils et al.	• Programmes by VINNOVA, SSF, KKS et al.	• Programmes by VINNOVA, SSF, KKS et al.
Support to creation and growth of innovative enterprises	• Support programmes for university technology parks		• Programmes by ALMI, Innovationsbron and Industrifonden • VINNOVA programmes
Boosting applied research and product development	• VINNOVA programmes	• Programmes by VINNOVA and KKS	• VINNOVA programmes

Legend

Top policy priority	**Secondary policy priority**	**Low policy priority**

Improving governance of innovation and knowledge policies

Technology foresight projects have been carried out twice and most recently in 2004. Broadly speaking, the conclusions have on the one hand been a series of tough challenges/choices for Swedish society and business life and on the other hand eleven broad and multidisciplinary technology fields in which Sweden is seen to have particularly good preconditions for future successes and to which R&D funding should be focused. The project reports take the opportunity to bring up several politically very sensitive topics, perhaps foremost of which is the suggestion to focus national resources to a few strong regions.

Innovation friendly environment

In 2001, the government bill "R&D and Collaboration in the Innovation System" made clear statements regarding mission-oriented research. While stating that the universities were to remain the primary source of publicly funded research, the research institutes were pointed out as important in supporting competence development in industry and as intermediaries between academic research and industrial application. Moreover, the bill clearly stated that the research institute system was to be consolidated into fewer and larger institutes with improved international competitiveness and that industry was expected to take on a greater responsibility for the institutes. Finally, the bill awarded all universities the right to establish holding companies to facilitate exploitation of their own research.

In 2004, the government launched the White Paper "Innovative Sweden" setting the agenda for innovation for several years to come. The strategy lists a number of measures that need to be implemented in future government bills and in assignments to government agencies. The strategy gives explicit reference to the Lisbon objectives.

The government commissioned inquiry "Improved Funding for Commercialisation of Innovations" details seven proposals to improve access to seed funding, some of which have been implemented.

Together with industry, the government has developed national strategy documents for six strategically important industry sectors in order to further develop these traditionally strong sectors. Some of these thoughts have been further developed into strategic research agendas for technology platforms in anticipation of FP7.

The most recent government research policy bill "Research for a Better Life" was presented in 2005. This bill further concentrated the previous research policy bill's funding focus to a mere three areas, namely life science, engineering and sustainable development. In addition, additional long-term funding was earmarked for centres of excellence in both curiosity-driven and mission-oriented research. Following up on "Innovative Sweden", the bill offered funding to improve efficiency of university holding companies, including capitalising them, facilitating SME access to R&D and reinstating some of the previously cut funding to the research institutes.

Regional Growth Programmes (RTP) document regionally developed policies, which include measures in favour of innovation and entrepreneurship based on regional conditions and needs.

Knowledge transfer and technology diffusion to enterprises

Most R&D knowledge transfer originates from the universities and often through the mechanisms of continuing-education courses, commission work for industry, exploitation through holding companies, graduates employed being by industry and through collaborative research projects; the latter two are the main mechanisms. While all the same mechanisms to some extent apply also to R&D knowledge transfer from research institutes, the emphasis on commission work and collaborative research projects is much stronger. The necessity of such transfer mechanisms being successful has been strongly emphasised in the aforementioned research policy bills and national innovation strategy, but few tools to support the mechanisms have been provided.

Innovation poles and clusters

Existing and emerging clusters, typically formed around structural capital such as universities, technology parks, incubators and research infrastructures, frequently find that available funding is insufficient, often on the side of cluster management activities. Research policy bills have placed emphasis on focusing of public funds to a limited number of key areas. Several programmes by sector agencies, research councils and semi-public research foundations have thus been implemented to facilitate development and/or strengthening of clusters and competence centres. Given the investments already made in curiosity-driven clusters and competence centres, the needs are the greatest at the mission-oriented end of the spectrum. There is also a general need for investments in technology parks, incubators and research infrastructures.

Support to creation and growth of innovative enterprises

Innovationsbron aids in commercialisation of research-related ideas through business development, incubators and seed funding. ALMI supports SMEs and innovators with business development advice and venture capital. Industrifonden provides equity capital and grants loans to innovative companies in a role resembling that of a private venture capitalist; in contrast, Innovationsbron and ALMI generally engage in higher-risk ventures. As a consequence of the most recent research policy bill, VINNOVA has a new programme to promote SME access to R&D and university holding companies will receive further financial support to facilitate exploitation of innovations.

Boosting applied research and product development

VINNOVA and to a lesser extent other agencies and semi-public research foundations have a range of programmes aimed at supporting mission-oriented R&D in collaboration between R&D providers and industry. Although this form of collaboration is

generally much appreciated by both industry and R&D providers, the funding is insufficient both in terms of overall budget and in terms of it being spread onto too many, too small projects requiring too much bureaucracy. VINNOVA and KKS provide funding for competence development for the research institutes, but so far on a level significantly lower than that prior to the draconian reductions in 2002-2003; however, over the next couple of year the funding will increase notably.

The recent report "Improved Competitiveness for Swedish Process Industry" commissioned by IVA, trade associations, trade unions, KKS, NUTEK, SSF and VINNOVA defines a set of research- and innovation-related policy areas that need to be addressed to ensure continued prosperity and development for Sweden's process industry, which is largely regionally based.

Overall assessment of policy mix

With the exception of the oft-questioned doctrine of the universities being the main providers of applied R&D and a suffocating tax burden, the government's policies are on the whole well-considered and – to a significant extent – address the disparities and needs pinpointed in Section 2. The White Paper "Innovative Sweden" provides an appropriate framework for future policy interventions, such as research policy bills. However, the government's commitment to actually push through with the necessary reforms and to allocate sufficient funds is not obvious. Part of the answer lies in the scant synchronisation between Ministries and sector agencies, translating into little coordination of innovation and knowledge measures.

On the whole, the private sector is unsatisfied with the lack of concrete action in terms of innovation support measures and related legislation. There is ample government pep talk pointing to areas where Sweden performs well, but little discussion, let alone concrete action, on the weak areas and in particular the fact that many indicators – while often still at comfortable levels – exhibit negative trends. Although official rhetoric often points in the right direction, this is seen as lip service; there is little concrete evidence of actual conviction in terms of facilitating innovation processes or improving conditions for entrepreneurs, not least from a taxation perspective.

3.3 Conclusions: the national innovation system and policy mix

Exhibit 8: Key opportunities and constraints for investment by the Structural Funds

Policy objectives	Opportunities for Community funding (national priorities)	Constraints or bottlenecks (factors limiting Community funding)
Improving governance of innovation and knowledge policies	• Partake in and support upcoming national/regional foresight projects	• The necessary measures to improve innovation and knowledge climate have been identified on the national level, but the political commitment (or capability) to push through with the measures is insufficient
Innovation friendly environment	• Enhance access to seed and venture capital (e.g. through collaboration with national/regional agencies) • Support innovation-related initiatives at universities	• Sweden already has appropriate national/regional organisations to support innovation processes, but the available seed and venture capital is inadequate • Culture of entrepreneurship is weak • Incentives for entrepreneurs to pursue their ideas are low, mainly due to tax legislation
Knowledge transfer and technology diffusion to enterprises	• Support technology-transfer schemes from universities and research institutes to industry • Support programmes for collaborative research projects between universities, research institutes and industry • Support technology parks (existing and new) and research infrastructures	• There is a limited number of SMEs with RTDI absorption capacity • Support of technology parks and research infrastructure would probably need to be coordinated with existing national schemes
Innovation poles and clusters	• Support application-oriented clusters having emphasis on private enterprises and research institutes (while not excluding universities)	• There are numerous competence-centre initiatives and graduate schools in academic environments, but far fewer initiatives in applied fields
Support to creation and growth of innovative enterprises	• Enhance access to seed and venture capital (e.g. through collaboration with national/regional agencies) • Support programmes for specific SME R&D schemes • Support incubators (existing and new)	• Sweden already has appropriate national/regional organisations to support innovation processes, but the available seed and venture capital is inadequate • Support of incubators would probably need to be coordinated with existing national schemes
Boosting applied research and product development	• Support programmes for collaborative research projects between universities, research institutes and industry • Support research infrastructures	• Sweden already has programmes for collaborative research projects, but the available funding is inadequate • Support of research infrastructure would probably need to be coordinated with existing national schemes • The possibilities for research institutes to participate in collaborative projects are limited due the low level of national funding that can be used for co-financing • Sweden's implementing authorities are seen as overly bureaucratic and prioritising detailed formal reporting over actual project contents

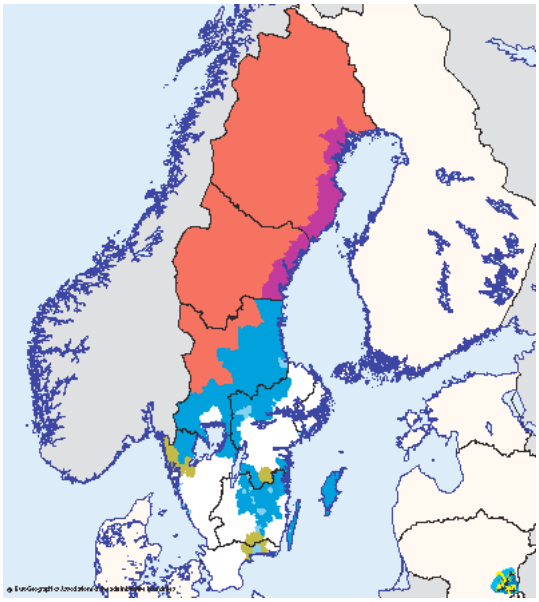
4 Structural Funds interventions to boost innovation and create a knowledge economy: 2000-2006

This section of the report provides an analysis of the patterns of Structural Funds (SF) expenditure in the fields of innovation and knowledge-based economy during the current programming period (2000-2006). It examines the patterns from both a strategic point of view (the policy mix pursued by the SF programmes) and at an operational level (consumption of funds, management of innovation measures, indications of relative effectiveness of measures, case studies of 'good' practice).

4.1 Strategic framework for Structural Funds support to innovation and knowledge

The following presentation and discussion is based on mid-term review and follow-ups of mid-term review, operational programmes (OPs) and sectoral operational programmes (SOPs), as well as information from NUTEK and telephone interviews with representatives of each programme.

Exhibit 9: Objective 1 and 2 regions in Sweden



Source: europa.eu.int/comm/regional_policy/atlas/sweden/se_en.htm

4.1.1 Strategic approach to innovation and knowledge in Structural Funds programmes

There are six operational programmes funded by ERDF and ESF[17] in Sweden, divided into regions by Objective 1 and 2. There are two Objective 1 OPs, **Norra Norrlandsregionen** and **Södra Skogslänsregionen**, wherein Objective 3 is integrated, and four Objective 2 OPs, **Norra**, **Södra**, **Västra** and **Öarna**[18] (see Exhibit 9).

[17] Other co-financers, apart from national funds, are the Guidance and Guarantee Fund (EAGGF), and the Fisheries Fund (FIFG).

[18] Note that the SF region Småland med öarna (referred to throughout this report) only includes Gotland and Öland as far as islands go, while the Öarna region in the OPs includes in excess of 500 larger island surrounding Sweden (including Gotland and Öland) as well as islands in the larger lakes.

The overall strategic objective of these programmes is to support structural and social change within regions lagging behind through creation of and/or maintaining job opportunities, as well as through contributing to an increased level of gender equality and sustainable development. In order to support change in innovation and knowledge, one aim of these programmes is to strengthen and support regional development and to promote knowledge-driven growth within industry. In particular, the programmes prioritise initiatives for increased knowledge, research and development. The majority of RTDI-related interventions support knowledge transfer and technology diffusion to enterprises as well as creation of innovations poles and clusters, complemented within Objective 2 programmes by support to creation and growth of innovative enterprises (Västra), boosting applied research and product development (Södra) and supporting an innovation friendly environment (Öarna).

The data in Exhibits 10 and 11 are based on allocation of SF budgets based on intervention code classifications. For practical purposes, the calculations of financial resources allocated to innovation and knowledge has been limited to the following RTDI codes:

- 181 Research projects based in universities and research institutes
- 182 Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes
- 183 RTDI Infrastructure
- 184 Training for researchers

Additional calculations based on broader definitions of innovation are presented in Appendix D.

Exhibit 10: Overall allocation of resources at Objective 1 and 2 levels (Euro).

Objective	Total cost	Structural Funds			National Funds	
		Total	ERDF	ESF	Public	Private
RTDI INTERVENTIONS						
Objective 1	181 368 070,60	98 122 417,20	96 306 988,80	1 815 428,40	83 245 653,40	0,00
Objective 2	86 588 958,15	36 581 269,61	36 581 269,61	0,00	50 007 688,54	0,00
TOTAL COHESION POLICY						
Objective 1	1 414 782 584,00	780 000 001,00	489 556 102,00	163 926 122,00	624 909 925,00	9 872 658,00
Objective 2	1 052 255 264,00	440 000 000,00	385 300 193,00	54 699 807,00	612 255 264,00	0,00

Source: Programming documents and financial data provided by DG REGIO.

Exhibit 11: Regional allocation of resources (Euro).

Programs	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
OBJECTIVE 1						
DOCUP Objective 1 Norra Norrlandsregionen	50 554 073,00	48 879 998,00	1 674 075,00	408 053 973,00	259 784 129,00	90 798 366,00
DOCUP Objective 1 Södra Skogslänsregionen	47 568 344,20	47 426 990,80	141 353,40	371 946 028,00	229 771 973,00	73 127 756,00
OBJECTIVE 2						
DOCUP Objective 2 Norra	0,00	0,00	0,00	192 500 000,00	164 621 351,00	27 878 649,00
DOCUP Objective 2 Öarna	673 078,26	673 078,26	0,00	31 216 218,00	26 528 718,00	4 687 500,00
DOCUP Objective 2 Södra	9 405 762,50	9 405 762,50	0,00	86 827 637,00	74 227 658,00	12 599 979,00
DOCUP Objective 2 Västra	26 502 428,85	26 502 428,85	0,00	129 456 145,00	119 922 466,00	9 533 679,00
Total Regional OPs	**134 703 686,81**	**132 888 258,41**	**1 815 428,40**	**1 220 000 001,00**	**874 856 295,00**	**218 625 929,00**

Source: Programming documents and financial data provided by DG REGIO.

Since Sweden's R&D expenditure, both public and business-related, is so high (cf. Section 2), SF expenditure is small in relation. 12.5% of Objective 1 funding and 8.2% of Objective 2 funding are spent on RTDI interventions, equal to 11% of the programmes' total. The distribution between the two regions within Objective 1 is

quite even; 12.4% of total funding in Norra Norrlandsregionen and 12.8% in Södra Skogslandsregionen go to RTDI interventions. Within Objective 2 regions, RTDI funding levels differ significantly. **Öarna** has only invested 2% of its funds on RTDI initiatives, while **Södra** has invested 11% and **Västra** 20.5%. Even though Objective 2, **Norra** shows no investment in RTDI interventions in Exhibit 11, such have indeed taken place, but have not been classified using categories 181-184; these interventions have been estimated to amount to approximately 10%[20]. In addition, there may be indirect RTDI effects resulting from e.g. measure 1.1 *Entrepreneurship and Business Development*, which offers support to SMEs. See further Appendix D.

RTDI investments are mostly the results of measures by local universities in collaboration with local authorities. Generally speaking, innovation and knowledge are among the first priorities of the regions, although there is a stronger emphasis on creating knowledge and knowledge-friendly environments than on innovation aspects.

Despite the fact that there are RIS/RITTS and Innovative Actions projects in Sweden, there appears to be little exchange between these and the regions in order to exploit results and experience gained to design and effectively implement RTDI interventions. Overall, there seems to be limited dialogue between the programmes in terms of learning from each other's experiences with interventions in RTDI and innovation.

4.1.2 Specific measures in favour of innovation and knowledge

Measures in favour of innovation and knowledge are mainly related to trade and industry development, divided into three major groups: (1) Support to businesses and entrepreneurs, (2) Areas of special needs and (3) Strengthened infrastructure for competence development, research and innovation. Exhibit 12 summarises the relative importance of innovation and policy measures.

Given Sweden's high spending on R&D (4% of GDP), a quarter of which is of public origin, SF contributions are marginal. Nevertheless, the innovation and knowledge measures funded through the SF during the 2000-2006 period have been important to the regions, e.g. through financially supporting development of cooperation and partnerships between regional universities and local industry, as well as through supporting innovative enhancements to infrastructure and transportation. The significant effort of installing a comprehensive IT infrastructure, as grounds for knowledge exchange in vast and remote regions, has also been facilitated.

Although SF interventions in innovation and knowledge measures are marginal compared to national investments in R&D, they address the disparities and needs identified in Section 2 quite well. National focus is to make Sweden a leading knowledge and research nation with world-class scientific competence and a great ability for innovation. The national goals are closely linked to the ambitions expressed in SF programmes. However, since every region appears to want to become a global competitor, resulting in regions competing with each other as well as difficulty in achieving critical mass[21], such goals without overriding national coordination may be counter-

[20] Information from Roland Dahlbäck, Programme Manager, Objective 2 Norra.

[21] The regions covered by OPs have higher unemployment than the country as a whole, which results in people moving for jobs. This complicates achievement of the critical mass required to support innovation and knowledge structures within these regions.

productive; the absence of national coordination is further elaborated upon in Section 3. Thus, although there is a good coherence between SF interventions and the policy mix summarised in Section 3, the importance of SF interventions should not be over-estimated due to their marginal financial weight and the fact that they are spread over several policy areas.

Exhibit 12: Key innovation and knowledge measures.

Policy area	Number of identified measures (all programmes)	Approximate share of total funding for innovation and knowledge measures	Types of measures funded (possibly indicating importance)
Improving governance of innovation and knowledge policies	0	0%	Technology foresight initiatives are not carried out on regional basis in Sweden
Innovation friendly environment	2	17%	Innovation financing and developing human capital for the knowledge economy
Knowledge transfer and technology diffusion to enterprises	8	13%	Direct and indirect support for knowledge and economy transfer
Innovation poles and clusters	0	0%	Direct or indirect support to poles and clusters
Support to creation and growth of innovative enterprises	4	60%	Direct and indirect support to creation and growth of innovative firms
Boosting applied research and product development	2	27%	Funding of industrial research projects and related infrastructure

NB: This table is a summary of the table in Appendix D.2. The total of the percentage shares per policy area may sum to more than 100% since certain measures fall into several categories.

Given Sweden's high spending on R&D (4% of GDP), a quarter of which is of public origin, SF contributions are marginal. Nevertheless, the innovation and knowledge measures funded through the SF during the 2000-2006 period have been important to the regions, e.g. through financially supporting development of cooperation and partnerships between regional universities and local industry, as well as through supporting innovative enhancements to infrastructure and transportation. The significant effort of installing a comprehensive IT infrastructure, as grounds for knowledge exchange in vast and remote regions, has also been facilitated.

Although SF interventions in innovation and knowledge measures are marginal compared to national investments in R&D, they address the disparities and needs identified in Section 2 quite well. National focus is to make Sweden a leading knowledge and research nation with world-class scientific competence and a great ability for innovation. The national goals are closely linked to the ambitions expressed in SF programmes. However, since every region appears to want to become a global competitor, resulting in regions competing with each other as well as difficulty in achieving critical mass[22], such goals without overriding national coordination may be counter-productive; the absence of national coordination is further elaborated upon in Section 3. Thus, although there is a good coherence between SF interventions and the policy

[22] The regions covered by OPs have higher unemployment than the country as a whole, which results in people moving for jobs. This complicates achievement of the critical mass required to support innovation and knowledge structures within these regions.

mix summarised in Section 3, the importance of SF interventions should not be overestimated due to their marginal financial weight and the fact that they are spread over several policy areas.

Overall, SF measures are coherent with the strategic objectives expressed within OPs, and in most regions programme objectives have been achieved or surpassed, sometimes with a comfortable margin. Even though numerous projects have been successfully concluded, it is not possible to authoritatively assess whether they have influenced regional development, since interventions are neither direct enough nor powerful enough to significantly influence development or reverse trends.

There are no significant differences between similar measures between Objective 1 and Objective 2 programmes. The impression is that Objective 1 and 2 regions do not coordinate interventions in innovation and knowledge to avoid duplication and overlapping and that they do not strive to exploit possible synergies. Competition is perceived to be within and between regions and actors often appear not to consider the nation or the Union as their market.

4.2 Learning from experience: the Structural Funds and innovation since 2000

4.2.1 Management and coordination of innovation and knowledge measures

This section reviews the overall management of SF interventions in favour of innovation and knowledge during the current period. It examines the coherence and the role of key organisations or partnerships in implementing SF measures for innovation and knowledge, the linkages between SF interventions and other Community policies (e.g. the RTD Framework Programme) and the financial absorption and additionality of the funds allocated to innovation and knowledge.

The SF are administered by the existing authorities and actors introduced in Section 3. The managerial effectiveness of implementing authorities is the subject of much criticism. Implementing authorities are said to show little pragmatism; types of measures possible in other countries are not permitted in Sweden. Grant recipients frequently complain that administrative controls are overzealous, thus diverting efforts from actual project contents. Another issue is the effort required to complete a proposal, meaning that SMEs often look elsewhere for more convenient forms of financing for their projects. Yet another bottleneck mentioned is problems caused by regional division, which does not always correspond to national administrative regions. The effect is that, for example, an SME wanting to do business within its natural geographical environment may only receive funding for activities within the parts of this environment that lie within the official support region. In essence, many potential applicants find that they can use their time more efficiently securing funding from other sources than the SF.

Several Objective 1 and 2 measures directly or indirectly focus on innovation and knowledge creation, but there is no overall management of such interventions. Such high-level innovation and knowledge-creation measures are usually addressed at national level. SF interventions focus on meeting regional and thus relatively basic needs in education, innovation and knowledge in order to support regional develop-

ment, rather than to support and complement the national innovation and knowledge economy. Moreover, implementing authorities claim they lack sufficient expertise to adequately evaluate RTDI-related proposals.

Key stakeholders complain of insufficient coordination of programmes and measures at all levels, likely stemming from issues elaborated upon in Section 3. Programmes aiming at RTDI development have generally emphasised a bottom-up approach, resulting in shortcomings regarding horizontal interventions and coordination. This has also influenced how measures' areas and actions are constructed, leading to separate and parallel activities without much ambition to avoid overlaps and exploit synergies. Cooperation between actors, as well as better alignment of policies and a balance between top-down and bottom-up approaches, could result in notable improvements in effectiveness. As far as is discernible, there are few initiatives to combine or link funding and support from other Community programmes with SF interventions at national or regional level, apart from what is set out in OPs.

Most measures on innovation and knowledge creation focus on intervention without immediate effects. It takes time to create innovation-friendly environments and supporting structures and to see effects of interventions made. Thus, indicators only measuring quantitative results of interventions, such as the presently used indicators, are inadequate. Nor do indicators give a fair impression of possible future results from interventions made, which is particularly important for projects running over longer periods of time, such as research and innovation projects. Implementing authorities would also like to see improvements in evaluation of and feedback from projects funded.

Public-private partnerships in innovation and knowledge creation are supported, but the largest co-financers are regional and local authorities, not private actors. These authorities, which are the largest actors within most programmes, function as distributors of funds to the next level of actors, e.g. businesses working with installing IT infrastructure or providing educational services. A substantial portion of SF interventions in innovation and knowledge creation are funnelled through universities and university colleges, thus indirectly supporting regional development.

Exhibits 13 and 14 show that the financial absorption capacity of RTDI measures on average is 70%; however, current data shows that absorption is 98%[23]. Differences between absorption capacity of regional and multiregional programmes differ with a few percent only, but there are still funds to be applied for in most programmes. Although there are factors affecting absorption beyond programme control thus making it difficult to manage full absorption, it is likely that Sweden will achieve very nearly full absorption before the end of the period. Nevertheless, a sentiment appearing in follow-ups of mid-term reviews is that it is hard to find effective use of funds at the end of a programming period, since planning then becomes a short-term exercise and innovation and knowledge measures generally require longer periods of time to be successful.

[23] Data from NUTEK.

Exhibit 13: Absorption capacity of RTDI interventions

OBJECTIVES	ALLOCATED	DISBURSED TOTAL SF	EXPENDITURE CAPACITY
Objective 1	98 122 417,20	69 950 124,80	71,3%
Objective 2	36 581 269,61	25 150 841,32	68,8%

Source: ISMERI.

Exhibit 14: Absorption capacity by field of intervention

CODES	ALLOCATED	DISBURSED	EXPENDITURE CAPACITY
OBJECTIVE 1			
18 - Research, technological development and innovation (RTDI) - detailed information unavailable	98 122 417,20	69 950 124,80	71,3%
TOTAL OBJECTIVE 1	**98 122 417,20**	**69 950 124,80**	**71,3%**
OBJECTIVE 2			
18 - Research, technological development and innovation (RTDI) - detailed information unavailable	26 685 091,76	18 246 228,80	68,4%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	9 896 177,85	6 904 612,51	69,8%
TOTAL OBJECTIVE 2	**36 581 269,61**	**25 150 841,32**	**68,8%**

Source: ISMERI.

To some extent, measures have been combined and funds have been reallocated from one measure to another to improve efficiency. For example measure 2.1 *Support to SMEs* and 2.2 *General support to the private sphere* within Objective 1 Norra Norrland was combined into 2.2 *SME development*, which also received additional funds from reserves.

When analysing successful measures, one aspect is determination of indicators. Objective 2 Öarna appears to have facilitated the creation of nearly ten times more SMEs than initially foreseen through measure 1.5 *Business life/infrastructure*, suggesting that the original aim was set way too low. This particular example could be a consequence of the fact that fulfilment of preset aims is a prerequisite for receiving further funds from reserves.

4.2.2 Effects and added value of Structural Fund support for innovation and knowledge

This section of the report analyses the effects and added value of the SF interventions in favour of innovation and knowledge creation during the current programming period. The analysis is based on two main sources, namely: a) available evaluation reports or studies concerning SF interventions; b) interviews and additional research carried out for this study. Accordingly, this section does not pretend to provide an exhaustive overview of the effects or added value[24] of SF interventions, but is rather based on the examination of a limited number of cases of good practice. These good practice cases may concern the influence of the SF on innovation and knowledge economy policies (introduction of new approaches, influence on policy development, etc.), integration of SF with national policy priorities, promoting innovative approaches to delivery (partnerships), or measures which have had a particularly important impact in terms of boosting innovation potential, jobs and growth.

[24] A good definition is "The economic and non-economic benefit derived from conducting interventions at the Community level rather than at the regional and/or national level". See Evaluation of the Added Value and Costs of the European Structural Funds in the UK. December 2003. (Available at : www.dti.gov.uk/europe/structural.html)

SF interventions in innovation and knowledge creation are of marginal importance compared to national investments, but they are important in responding to regional and local needs in ways national programmes do not. Since the programmes' overall objective is to support structural and social change through creation of and/or maintaining job opportunities, interventions focus on meeting relatively basic needs in order to support regional development, rather than taking a more holistic national perspective.

Interventions in favour of innovation measures have largely focused on entrepreneurial activities, creation of new businesses and innovative actions focused on product development, all with the ambition of maintaining or creating jobs (see Best Practice box for an illustrative example). Interventions in favour of knowledge creation generally have very diverse aims; examples include coordination of educational efforts within a region or local community, inclusion of an entire region in an educational effort and development of educational infrastructure, such as regional universities.

Best Practice Project Summary: The Coaching Circle

The Coaching Circle (MentorRingen), funded by Objective 2 Södra within measure Support to innovations, offering start-up and spin-off effects, is a coaching network primarily supporting female innovators having an innovation with commercial potential to find capital and other contacts in order to realise commercialisation, either through already existing producers or new entrepreneurs. The main instruments of the initiative are networking and interaction, coaching, knowledge and experience exchange, all in a structured format. The participants are chosen carefully according to a specific model – after a prototype is constructed and the potential market analysed – in order to increase the chances of succeeding within the available time frame. Innovators get support to offset their products, while entrepreneurs and SMEs find innovators within a professional format, supported by an organisation, and production may lead to new job opportunities. The main beneficiaries are actors in the private sector.

Three circles are currently up and running with a total of 20 active innovators. In excess of 20 innovations are waiting to be exploited, five of which have led to production within less than a year. One innovation is in production in a company recently started by the innovator herself, while the others are subcontracted; both alternatives have created new employment opportunities. In relation to the funds spent, the number of potential start-ups and spin-offs is impressive, and the project offers win-win situations for all involved. The project is also innovative in itself. A main lesson is that support to innovators must be financially prioritised if innovations by users and other non-academic or non-industrial actors are to reach production, since the efforts required to create a prototype is normally both time-consuming and financially non-rewarding.

In most cases, programme objectives have been reached, but it is often impossible to determine whether they have positively influenced regional development, since interventions are not focused enough to significantly influence development. Nevertheless, measures geared towards innovation and knowledge creation have had expected impacts, and often with very good results. For example, several measures to support creation of new SMEs in different regions have well exceeded their targets. It appears as if implementing authorities are beginning to learn how to support innovation and knowledge measures tailored to regional prerequisites and needs. Results are also obvious in terms of general knowledge and technology communication, most easily seen through growing regional universities and university colleges.

There is no measure aimed at providing seed or venture capital for innovative SMEs. On the contrary, the perception is that capital is very hard to come by through SF programmes, since application processes are arduous and time-consuming, while SMEs needs are measured on a completely different time scale.

Implementing authorities have an apparently well-deserved reputation for bureaucracy, thus discouraging many potential applicants and in particular SMEs. There is scant coordination between programmes and measures, between regions and between SF interventions and national initiatives, meaning that overlaps abound and potential synergies are not exploited. There is thus a need for an overall strategy and alignment of national priorities and SF programmes regarding regional needs and ambitions in RTDI.

There are several measures related to innovation and knowledge creation showing potential for further expansion in the upcoming SF period, such as:

- Improving regional access to qualified RTDI competence
- Creating innovation-friendly environments
- Supporting regional development policies
- Supporting creation of arenas for new RTDI ideas
- Supporting existing businesses with ambitions to innovate
- Supporting entrepreneurships and starting of new businesses
- Supporting cooperation between academia, entrepreneurs and local authorities

4.3 Conclusions: Structural Funds interventions in favour of innovation and knowledge

The financial weight of SF interventions in favour of innovation and knowledge creation is marginal compared to national investments, but they are important in complementing national initiatives. A number of examples of successful interventions in the current programming period underline the significance of SF interventions in RTDI. Thus, SF interventions in RTDI can play a key role if they are well considered, well executed and focused on a limited number of measures tailored to the needs of would-be entrepreneurs and enterprises with innovative capabilities, in particular SMEs. However, one of the main strategic lessons to be learned is that SF interventions in RTDI need to be better planned and coordinated between regions and with respect to national initiatives. Moreover, key stakeholders agree on the need to improve and streamline management, which is currently seen as bureaucratic and inflexible, thus discouraging many potential applicants.

The main outcomes of SF interventions in favour of innovation and knowledge creation are summarised in Exhibit 15.

Exhibit 15: Main outcomes of innovation and knowledge measures.

Programme or measure[25]	Capability	Added value
Research and innovation	Excellent absorption capacity	Complements national initiatives
Support to SMEs	Excellent absorption capacity	Complements national initiatives
R&D, learning centres, competence and development centres	Excellent absorption capacity	Complements national initiatives

[25] Most of these programmes are parallel between regions, and therefore only mentioned once in the table, even though they may have different regional impact in different regions.

5 Regional potential for innovation: a prospective analysis

This section of the report seeks to summarise and draw conclusions from the analysis of the preceding sections, available studies and interviews and focus group carried out for this study in order to provide an analysis of the regional innovation potential. In doing so, the aim is to provide a framework for orientation in terms of future SF investments in innovation and knowledge.

5.1 Factors influencing regional innovation potential

The 2004 Technology Foresight project identified 11 multidisciplinary fields in which Sweden has the best preconditions for continued competitiveness and in which a large proportion of public R&D funding should be concentrated[26]:

- Safer/more secure complex systems
- Mechanical systems and structures
- Interactive technology
- Functional materials
- Environmental and life cycle technology
- Mobile energy supply
- Safety, security and protection
- Sustainable food production
- Accessible IT
- Health care technology

Three quarters of Swedish spending on R&D (3% of GDP) is invested by industry. By and large, the R&D activities are particularly strong in the following regions and technology fields[27]:

- Automotive applications in Västsverige, Småland med öarna, Östra Mellansverige Stockholm and Övre Norrland
- Paper and pulp in all regions except Stockholm
- Metalworking in Sydsverige, Västsverige, Småland med öarna, Östra Mellansverige, Mellersta Norrland and Övre Norrland
- Machinery in Sydsverige, Västsverige, Småland med öarna, Östra Mellansverige and Stockholm
- IT and telecom in Stockholm, Sydsverige, Västsverige and Östra Mellansverige
- Pharmaceuticals in Stockholm, Östra Mellansverige and Sydsverige
- Food in Sydsverige, Västsverige, Småland med öarna and Stockholm
- Business services, including financial services, in Sydsverige, Västsverige, Småland med öarna, Östra Mellansverige, Stockholm and Mellersta Norrland

To a significant extent, these technology fields and regions reflect the fact that 20 companies account for nearly 70% of industrial R&D investments.

Given the doctrine of the universities being the main providers of applied R&D, the remaining quarter of Swedish R&D spending (1% of GDP), i.e. the public invest-

[26] "Choosing Strategies for Sweden", synthesis report from the Swedish Technology Foresight project, 2004.

[27] Listing is partly based on information in "Svenska klusterkartor, En statistisk inventering av kluster i Sverige 2002", CIND, Uppsala University, 2002.

ments, is heavily concentrated to the main university cities, translating into a notable concentration to Stockholm, Västsverige, Sydsverige, Östra Mellansverige and Övre Norrland.

Exhibit 16 summarises the main factors influencing future innovation potential in Swedish regions.

Exhibit 16: Factors influencing innovation potential by type of region. "1" is poor and "5" is excellent

Region	Public R&D expenditure	Industrial R&D expenditure	Qualifications of human capital	Infrastructure	Technology diversification	Cooperation between private companies	Cooperation between industry and academia	Tradition of entrepreneurship
Stockholm	5	5	5	5	5	5	4	4
Västsverige, Sydsverige	5	5	5	4	4	5	4	2
Östra Mellansverige	4	5	5	3	3	5	4	2
Småland med öarna	1	2	2	3	3	5	1	4
Norra Mellansverige, Mellersta Norrland, Övre Norrland	1/3*	2	3	2	1	3	1/3*	1

* Applies to Övre Norrland

5.2 A prospective SWOT appraisal of regional innovation potential

Exhibit 17: Innovation and knowledge SWOTs

Stockholm	Opportunities	Threats
Strengths	• Excellent human capital • High concentration of R&D	• Globalisation
Weaknesses	• Flaws in innovation system • RTDI in SMEs insufficient • Human capital not fully exploited (immigrants and, to some extent, women)	• Tax legislation for entrepreneurs • Weak commercialisation support systems

Västsverige, Sydsverige	Opportunities	Threats
Strengths	• Excellent human capital • High concentration of R&D	• Globalisation
Weaknesses	• Flaws in innovation system • RTDI in SMEs insufficient • Human capital not fully exploited (immigrants and, to some extent, women) • Strong dependency on few automotive enterprises (Västsverige)	• Tax legislation for entrepreneurs • Weak commercialisation support systems

Östra Mellansverige	Opportunities	Threats
Strengths	• Excellent human capital • High concentration of R&D	• Globalisation
Weaknesses	• Flaws in innovation system • RTDI in SMEs insufficient • Human capital not fully exploited (immigrants and, to some extent, women) • Industrial structure and necessity to adapt to new economic realities	• Tax legislation for entrepreneurs • Weak commercialisation support systems

Småland med öarna	Opportunities	Threats
Strengths	• Tradition of entrepreneurship	• Globalisation
Weaknesses	• Flaws in innovation system • RTDI in SMEs insufficient • Under-developed service sector • Low business R&D • Few universities • Sensitive sectoral composition including traditional industry	• Tax legislation for entrepreneurs • Weak commercialisation support systems • Small local market

Norra Mellansverige, Mellersta Norrland, Övre Norrland	Opportunities	Threats
Strengths	• Natural resources	• Globalisation
Weaknesses	• Flaws in innovation system • RTDI in SMEs insufficient • Under-developed service sector • Low business R&D • Industrial structure composition	• Tax legislation for entrepreneurs • Weak commercialisation support systems • Small local market

5.3 Conclusions: regional innovation potential

Policy headline 1: Stockholm, Västsverige and Sydsverige have excellent innovation potential

The innovation potential of the big-city regions Stockholm, Västsverige and Sydsverige is world-class and by many accounts this potential is well exploited. R&D expenditure is high, people are well educated, infrastructure is good and industry is diversified. There is also a tradition of cooperation within industry and between industry and academia, as well as of entrepreneurship in the case of Stockholm. However, there are several weak links in the innovation system that, if adequately addressed, would release additional innovative potential. The main limiting factors are insufficient economical incentives for potential entrepreneurs, insufficient access to capital, a fragmented and inefficient innovation support system, as well as insufficient cooperation between R&D providers and industry.

Policy headline 2: Östra Mellansverige's rich industrial tradition provides a good foundation for unleashing the region's good innovation potential

The innovation potential of Östra Mellansverige is very good with high R&D expenditure, well-educated people and a tradition of cooperation within industry and between industry and academia. The picture is somewhat tarnished by the dependency on traditional heavy industry translating into moderate industry diversification, partly inadequate infrastructure and no strong entrepreneurship tradition. The weak links of the innovation system mentioned under policy headline 1 also apply to this region.

Policy headline 3: Småland och öarna has good innovation potential, which together with the region's entrepreneurial tradition forms a powerful potential source of growth

Småland och öarna has a strong tradition of entrepreneurship, which is supported by a strong tradition of cooperation within industry; this has resulted in the large number of SMEs for which the region is well known. However, the innovation potential is only fair, since R&D expenditure (especially within SMEs) is quite low, people are in general (by Swedish standards) not very well educated and cooperation between industry and academia is weak. Moreover, infrastructure and technology diversification are only fair. The weak links of the innovation system mentioned under policy headline 1 also apply to this region.

Policy headline 4: The vast natural resources of Norra Mellansverige, Mellersta Norrland and Övre Norrland constitute good preconditions for growth

Overall, the innovation potential of Sweden's three northernmost regions is low, due to low R&D expenditure, only moderately well educated people, rather poor infrastructure (away from the coast), heavy dependency on forestry and mining, a weak tradition of cooperation within industry and between industry and academia and little tradition of entrepreneurship. However, it should be noted that Övre Norrland, largely due to its large universities, has a significantly better track record than the other two regions in terms of public R&D expenditure and cooperation between industry and academia. The weak links of the innovation system mentioned under policy headline 1 also apply to this region.

6 Future priorities for Structural Fund support for innovation and knowledge: options for intervention

The government seeks to align the Strategic Reference Framework with its national regional development policy that aims to ensure well-functioning and sustainable regions throughout the country[28]. The recommendations below appear to agree very well with the government's priorities, possibly with the exception of the final recommendation to make no regional priorities, which was strongly argued by focus group attendees and interviewees alike.

As illustrated in Section 4, 11% of the overall SF interventions in Sweden for Objectives 1 and 2 during the present programming period are classified as RTDI-related. Given Sweden's excellent overall financial absorption capacity, it is assumed that at least the same order of total interventions could be absorbed also during the upcoming period. However, it is proposed that RTDI-related interventions are increased to at least 40% of the total. Weighting between the different proposed foci are given in Exhibit 18 and, based on the first recommendation below, there should be no regional preferences for these SF interventions. All of the proposed measures would very well complement upcoming FP7 and CIP measures.

6.1 Strategic orientations for Structural Fund investments in favour of innovation and knowledge

Key conclusion 1: Technology transfer and collaboration between R&D providers and industry, particularly SMEs, is insufficient

Three main factors have led to Sweden exhibiting insufficient technology transfer and collaboration between R&D providers and industry, particularly SMEs:

- The Swedish doctrine that universities should be the main providers of both curiosity-driven and mission-oriented research services
- A long-standing policy favouring curiosity-driven over mission-oriented research
- A weak, fragmented and small institute sector (largely a result of the two previous bullets)

Despite over 50 years of perseverance, the promises of the aforementioned doctrine have not been fulfilled by the universities, who have essentially proven incapable of fulfilling the expected function of intermediary between academic research and industrial application and do not live up the needs of industry in terms of contract R&D. The combination of weak research institutes and strong, but in terms of industrial contract R&D inadequate, universities, has resulted in a notable and well-known weakness in the innovation system.

[28] At the time of completion of this report, the Swedish Strategic Reference Framework was not yet public, due to it not having been formally adopted by the government. The insight into the government's likely priorities stems from material used in regional focus group discussions that were employed in development of the Strategic Reference Framework. ("Diskussionsunderlag: Ett nytt inslag i den regionala utvecklingspolitiken", Department of Industry, Regeringskansliet, 2005.)

Recommendation 1: Launch programme to encourage technology transfer and collaboration between R&D providers and industry, particularly SMEs, through innovative funding instruments

While the government belatedly has recognised that the institute sector has a valuable and possibly critical role in the innovation system, the three bullets above still apply (although a slow process to strengthen and consolidate the institute sector is underway). This weakness in the innovation system can be addressed by the SF through innovative instruments to complement national initiatives for collaboration between R&D providers and industry – with emphasis on SMEs – such as:

- Improving industry access to research institutes' R&D services through simple and fast funding instruments commensurate with SME needs ("quick and dirty" approach; cf. Recommendation 6)
- Fostering universities' ability to cooperate with industry through funding instruments targeting industry-driven, close-to-market R&D projects

Such instruments should involve direct public funding of the R&D providers' work and in-kind (or cash) contributions by private enterprises and should target significantly smaller projects than the FP7 successors of STREP and CRAFT projects in FP6.

Key conclusion 2: Programmes for collaborative research projects between R&D providers and industry are insufficient

National agencies have a range of programmes aimed at supporting mission-oriented R&D in collaboration between R&D providers and industry. This form of collaboration is generally much appreciated by both industry and R&D providers, but the available funding is insufficient both in terms of overall budget and in terms of it being spread onto too many, too small projects requiring too much bureaucracy.

Recommendation 2: Launch programme to fund collaborative research projects between R&D providers and industry

Launch programme to support mission-oriented R&D in collaboration between R&D providers and industry to complement national programmes. In the current, popular Swedish model for such collaborative R&D, private enterprises make in-kind contributions while R&D providers receive the public funding; copying this methodology would simplify introduction and acceptance of such SF programmes. Further learning from national experience, it is imperative that SF programmes achieve a balance between funding amounts and the level of bureaucracy for proposal-writing and reporting, meaning larger individual projects and simplified administrative procedures (cf. Recommendation 6). Such instruments would very well complement collaborative FP7 instruments, such as the successors of the STREP and CRAFT projects in FP6, and would financially be of the same order of magnitude as these instrument types.

Key conclusion 3: Available seed and venture capital is insufficient

Available seed and venture capital is insufficient and the degree of risk accepted is generally rather low. One often-quoted reason for the lack of capital is that there are very few private business angels, partly due to a tax system that results in Swedish capitalists investing outside the country.

Recommendation 3: Launch and capitalise professionally managed fund for seed and venture capital

A professionally managed SF fund for seed and venture capital investing in both high-risk, high-gain business ventures and business ventures from mature fields where short-term gains may be less spectacular, would address a major flaw in the innovation system. In doing so, providing professional management support for recipients of capital would be essential.

Key conclusion 4: Emerging clusters have difficulties developing due to lack of funds

Existing and emerging clusters, often formed around a concentration of private enterprises or structural capital such as universities, technology parks, incubators and research infrastructures, frequently find that funding is insufficient, often on the side of cluster management activities rather than for infrastructure investments. It is noteworthy that otherwise very prosperous regions, including Stockholm, are in great need of funding for cluster management activities due to weak regional structures. Given substantial national investments in curiosity-driven clusters and competence centres already made, the needs are the greatest at the mission-oriented end of the spectrum.

Recommendation 4: Launch programme to fund industry-driven clusters

An SF programme to financially support existing and emerging industry-driven clusters with emphasis on both cluster management activities and infrastructure investments would address a key flaw in the innovation system. Such a programme should primarily target private enterprises – in particular SMEs – and research institutes, while not excluding universities. Such an SF programme should permit funding of corollary cluster activities, such as joint export ventures and writing of proposals to FP7, CIP and similar programmes, so as to further cluster development. It is imperative that an SF programme achieves a balance between funding amounts and the level of bureaucracy for proposal-writing and reporting, meaning large individual projects and simple administrative procedures (cf. Recommendation 6).

6.2 Operational guidelines to maximise effectiveness of Structural Fund interventions in favour of innovation and knowledge

Key conclusion 5: Strategic planning of SF interventions is insufficient

Key stakeholders find that strategic planning is insufficient leading to scant coordination between programmes and measures, between regions, as well as between SF interventions and national initiatives, which in turn translates into overlaps and unexploited synergies.

Recommendation 5: Ensure ex-ante strategic planning of SF interventions on national level

In planning interventions for the upcoming programming period, the strategic direction of SF interventions should be coordinated at national level with clear responsibilities assigned to one unique agency. The same agency should also ensure coordination with national programmes. Among the important functions of this coordination are to eliminate overlaps and exploit synergies between programmes and measures, as well as to eliminate unsound competition between regions aiming to focus on conflicting topics. This top-down approach should be complemented with bottom-up activities in detailed planning and implementation.

Key conclusion 6: National management of SF interventions is inefficient

Key stakeholders find that operative management of programmes is bureaucratic and inflexible and that the required technical and management skills are not always available.

Recommendation 6: Streamline and professionalize national management of SF interventions

Enshrine minimum bureaucracy procedures and pragmatism in policy documents; such guidelines may for example stipulate:

- Reducing proposal and reporting requirements to a minimum to ensure a balance with actual project contents
- Allowing a considerable amount of freedom in terms of how funds are used and instead focus on project outcomes
- Allowing a significant element of risk

In this context, rapid and simple ("quick and dirty") administrative processes are of paramount importance to respond to the urgency in industry needs; ten-page proposals and three months between proposal deadline and notification of evaluation results may serve as indications of desirable targets. Implementing authorities should further be required to ensure that they have the expertise necessary to evaluate proposals, e.g. modelled after FP6 evaluations. Moreover, projects should include compulsory evaluations upon project completion (in addition to intermediate evaluations for long projects), so as to facilitate learning and consequently continuous improvement of programmes, instruments and administrative procedures.

Key conclusion 7: The key to sustainable growth is innovation in private enterprises and in particular in SMEs

Historic developments have awarded Sweden with a handful of competitive MNC that dominate business life. Sweden also has a plethora of micro-SMEs, but there are few medium-sized SMEs and enterprises with a few thousand employees, meaning that there are few potential future Volvos, Ericssons and SCAs to sustain growth and ensure continued prosperity.

Recommendation 7: Concentrate SF interventions to private enterprises, particularly SMEs, to foster innovation and sustainable growth

SF interventions to stimulate innovation and knowledge creation should primarily target private enterprises and in particular SMEs. Moreover, it is important that such interventions have a firm foundation in the true needs of would-be entrepreneurs and private enterprises with innovative capabilities.

Key conclusion 8: Need for stimulation of innovation and knowledge creation is nationwide

Given Sweden's relatively high spending on R&D (4% of GDP), the contribution from the SF is marginal, but it can still make a significant contribution in unleashing hitherto unexploited innovation potential through specifically addressing the weak links of the innovation system. These weak links affect all regions and in aiming to maximise yield on SF interventions, they should support the most competitive proposals regardless of their geographical origin.

Recommendation 8: Do not target SF interventions to any specific region(s)
SF interventions should treat proposers from all regions equally, since needs are nationwide. Allocation of funds should be competitively based on the merits of each individual proposal.

Exhibit 18: Summary of recommendations on investment priorities

Region or group of regions	Strategic focus	Priority measures	Relative distribution of SF interventions in RTDI
All regions	R&D funding	**Recommendation 1:** • Support innovative instruments for collaboration between R&D providers and industry with emphasis on SMEs by: - Improving access to research institutes' R&D services through simple and fast funding instruments - Fostering universities' ability to cooperate with industry through industry-driven, close-to-market R&D projects	20%
All regions	R&D funding	**Recommendation 2:** • Support mission-oriented, collaboration R&D projects following established national model	30%
All regions	Seed and venture capital	**Recommendation 3:** • Establish professionally managed fund for seed and venture capital investing in: - High-risk, high-gain business ventures - Business ventures from mature fields where short-term gains may be less modest	30%
All regions	Emerging and developing clusters	**Recommendation 4:** • Support management activities, infrastructure investments and corollary cluster activities of industry-driven clusters	20%

Appendix A Methodological annex

A.1 Quantitative analysis of key knowledge economy indicators

A 1.1 Factor analysis

In order to analyse and describe the knowledge economies at regional level in the EU, the approach adopted was to reduce and condense all relevant statistical information available for a majority of regions. The approach involved firstly reducing the information from a list of selected variables (Table 1) into a small number of factors by means of factor analysis.

Table 1. Reduction of the dataset (215 EU27 regions) into four factors by means of factor analysis.

	The 4 factors			
	F1 'Public Knowledge'	F2 'Urban Services'	F3 'Private Technology'	F4 'Learning Families'
Higher education (HRSTE), 2003	**.839**	.151	.190	.184
Knowledge workers (HRSTC, core), 2003	**.831**	.164	.267	.327
High-tech services employment, 2003	**.575**	.367	.428	.323
Public R&D expenditures (HERD+GOVERD), 2002	**.543**	.431	.275	-.195
Value-added share services, 2002	.323	**.869**	.002	.121
Value-added share industry, 2002	-.265	**-.814**	.386	-.061
Employment government administration, 2003	-.217	**.745**	.124	-.175
Population density, 2002	.380	**.402**	.043	.038
High and Medium/high-tech manufacturing employment, 2003	-.073	-.331	**.873**	-.089
Value-added share agriculture, 2002	-.222	-.350	**-.672**	-.198
Business R&D expenditures, 2002	.335	-.050	**.664**	.267
S&T workers (HRSTO, occupation), 2003	.560	.178	**.589**	.382
Population share under 10 years of age, 2001	-.237	.060	-.015	**.868**
Life-long learning, 2003	.472	-.009	.165	**.703**
Activity rate females, 2003	.418	-.227	.281	**.620**

Note: Principal Component Analysis. Rotation Method: Equamax with Kaiser Normalization, a Rotation converged in 9 iterations. Main factor loadings are highlighted in bold. Source: MERIT, based on Eurostat data, mostly referring to 2002 or 2003

Based on the variable with the highest factor loadings we can characterise and interpret the four factors and give them a short symbolic name:

Public Knowledge (F1)

Human resources in Science and Technology (education as well as core) combined with public R&D expenditures and employment in knowledge intensive services is the most important or common factor hidden in the dataset. The most important variables in Public Knowledge are the education and human resource variables (HR S&T education and core). Cities with large universities will rank high on this factor. One interesting conclusion is that public and private knowledge are two different factors (F1 and F3 respectively), which for instance has implications for policy issues regard-

ing Science-Industry linkages. Public R&D and higher education seems especially related to high-tech services, whereas Business R&D especially serves high- and medium-high-tech manufacturing.

Urban Services (F2)

This second factor contains information on the structure of the economy. It is well known that industrial economies are quite different from services based economies. It is not a matter of development per se, because in the European regions the variety of economic structure is very large and for a large part based on endowments and path dependent developments like the extent to which government administration is located in a region or not. This factor takes into account the differences between an industrial area and a service based area including the public administration services of the government. Another observation is that there are two different 'urban' factors, indicating that academic centres not necessary co-locate with administration centres. What may not be surprising is that the Urban Services factor is not associated with R&D, since R&D is more relevant for innovation in manufacturing than for service industries.

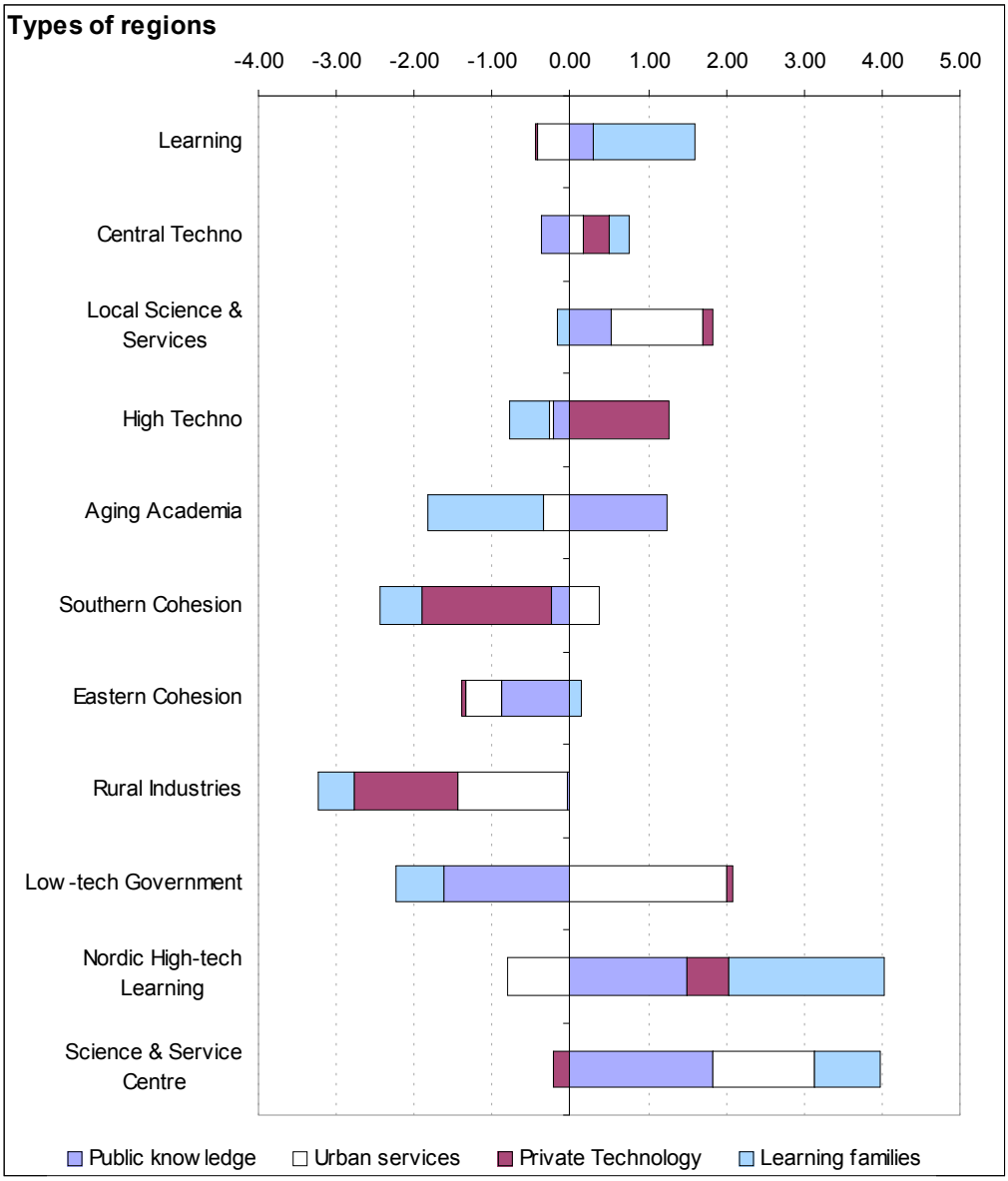
Private Technology (F3)

This factor contains business R&D, occupation in S&T activities, and employment in high- and medium-high-tech manufacturing industries. A countervailing power is the existence of agriculture in the region. One interpretation could be that agricultural land-use goes at the cost of possibilities of production sites. Another interpretation is that agriculture is not an R&D intensive sector.

Learning Families (F4)

The most important variable in this factor is the share of the population below the age of 10. Locations with relatively larges shares of children are places that are attractive to start a family. Possibilities for Life Long Learning in a region seems associated with the lively labour participation of the mothers of these youngsters. The Learning Families factor could also be interpreted as an institutional factor indicating a child-, learning- and participation- friendly environment, or even a 'knowledge-society-life-style' based on behavioural norms and values that are beneficial to a knowledge economy.

A 1.2 Description of the 11 types of EU regions



1 Learning

The Learning regions are first of all characterised by the high score on the factor 'Learning Families', and the three main components of this factor: life-long-learning, youth and female activity rate. On the other factors the regions are close to the regional average. Unemployment is on average the lowest compared to the other EU regions. Employment in the government sector is limited. GDP per capita is rather high. The regions are located in Austria, Ireland, the Netherlands, Sweden and the UK. There are many similarities with the Nordic High-tech Learning regions, but the business sector in the Nordic version invests more in R&D.

2 Central Techno

This is a rather large group of regions located mostly in Germany and France with close to average characteristic, but the share of High-tech manufacturing is rather

high. The factor-scores as well as GDP-per head are slightly above the regional average, except for the Public Knowledge factor which is slightly lower.

3 Local Science & Services
This group of regions with diverse nationality consist mainly of capital cities, such as Madrid, Warsaw, Lisbon, Budapest and Athens. These urban areas serve as national centres for business services, government administration, public research institutes and universities. Urban Services and Public knowledge are therefore the strongest factors for this type of region. GDP per capita is on average slightly below the EU25 average, but growing. The low score on life-long-learning is a weakness in most Local Science & Services regions, especially compared to the more wealthy and advanced Science & Service Centres.

4 High Techno
The High Techno regions host many high-tech manufacturing industries. They are mostly located in Germany (e.g. Bayern and Baden-Wurtemberg), some in Italy (e.g. Lombardia and Veneto) and two French regions. This type is very strong in Private Technology and has a high level of GDP per capita. The factors Public Knowledge and especially the Learning Family factor shows a relative weakness, e.g. in life-long-learning. Growth in terms of GDP per capita has been low and unemployment didn't improve much in the previous years.

5 Aging Academia
This group of regions is mostly located in East Germany and Spain and also includes the capital regions of Bulgaria and Romania. The strength in the Public Knowledge factor is mostly based on the high share of people with tertiary education. The low score on the Learning Family factor is due to little life-long-learning and hosting relatively few children. The unemployment situation has improved, but is still very high.

6 Southern Cohesion
Southern cohesion regions are located in Southern Europe, consisting of many Greek, some Spanish and two Portuguese regions. The low score on the Private Technology factor is striking. There is hardly any high-tech manufacturing nor business R&D. Services is the most important sector, but also agriculture is still a rather large sector. The share of manufacturing industry in value added is very limited. Population density is low, but on average it has been increasing.

7 Eastern Cohesion
Manufacturing industries is the dominant sector, whereas services and agriculture are rather small sectors. This type of region is mostly located in Poland, Czech Republic, Hungary and Slovak Republic. Two Portuguese regions are also included. The Public Knowledge factor is the main weakness of this type of regions. However, the score on the Private Technology factor is close to average, which means that it is much stronger in this respect than the Southern Cohesion regions. Unemployment is high, even compared to Rural Industries and Southern Cohesion regions.

8 Rural Industries
Besides a low per capita GDP, Rural Industries regions have in common a low score on both the factors Urban Services and Private Technology. Population density is very low. The service sector is often very small. Especially agriculture but also manu-

facturing industries are relatively large sectors. Besides regions in Bulgaria and Romania and Greece, there is also a more Nordic sub-group consisting of Estonia, Lithuania and Itä-Suomi.

9 Low-tech Government

This type of region, mostly located in southern Italy is characterised by a very low score on Public Knowledge combined with a high share of employment in the Government sector. Unemployment is severe, on average comparable to Eastern Cohesion regions. GDP per capita is however close to the regional average.

10 Nordic High-tech Learning

The Nordic version of the learning regions are typically strong in the Learning Family factor, but this type also has by far the highest business R&D intensity. In contrast with the popular characterisation of Nordic societies, the size of the government administration is the lowest of all the types. The low score on Urban Services is also due to the low population density. A rather unique feature of this type of regional knowledge economy is the combined strength in both the Public Knowledge and the Private Technology factor.

11 Science & Service Centre

The main characteristics of this urban group of regions are the high scores on the Public Knowledge and Urban Services factors. Population density is very high. This type also has the highest GDP per capita and productivity. The variables that are captured by the factor Learning Families also show a score above the regional average, but disappointing is the relatively low presence of high and medium-high-tech manufacturing and the business R&D intensity.

A.2 Qualitative analysis and preparation of country reports

In summary, the country reports were prepared in the following stages:

A first country document was prepared by the core study team in the form of a **template country report**. It contained overall guidance to the country experts and included a number of pre-filled tables, graphs and analysis sections based on information available at EU level.

Next, the core team members and the national experts who were involved in the pilot phase of the project commented completed elements of the templates. Drafted elements and templates were completed and compiled into **first country briefings (draft pilot reports)** by the national experts involved in the pilot phase of the project. These pilot country reports were prepared by experts for Belgium, Greece, Italy, France, and Poland.

Once the five first country briefings were completed, a **final set of guidelines** was prepared by the core team. These guidelines were agreed with the Commission services responsible for this evaluation. Prior to this, all first country briefings were reviewed during the January 2006 and presented to a first meeting of the scientific committee.

The work during the **country analysis phase** included:
Undertaking a series of key interviews (KI) with policy decision makers;
Organising a focus group (FG) with key national or regional RDTI stakeholders;
Collecting additional information and finalising short case studies; and
Preparing the synthesis notes of these various activities.

The above-mentioned work served as qualitative data and allowed the national experts to compile the draft **country reports**. All reports were subsequently reviewed, checked and finalised by the core team and the consortium members. Once this first check was completed, the core team organised a final peer reading of the document to verify its overall consistency and to ensure a final English language editing of the document. The core team then completed the final editing and layout of the document with a view to publication.

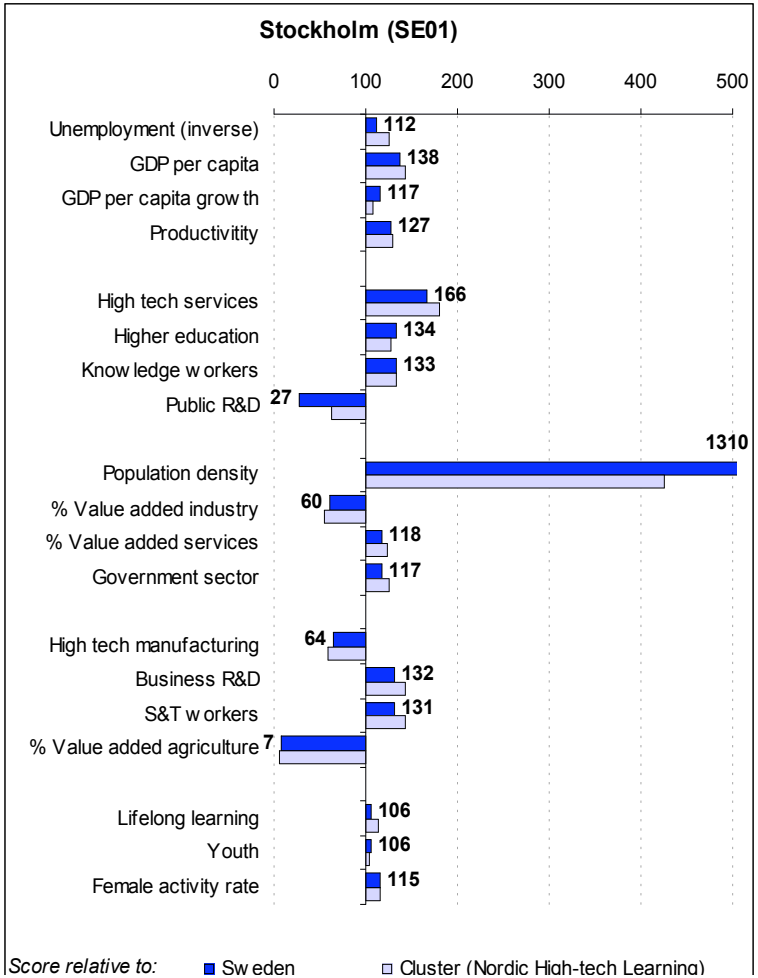
An overall synthesis report of all has been prepared and will be published by the European Commission providing an overview of the issues addressed in each of the 27 country reports produced by the evaluation team.

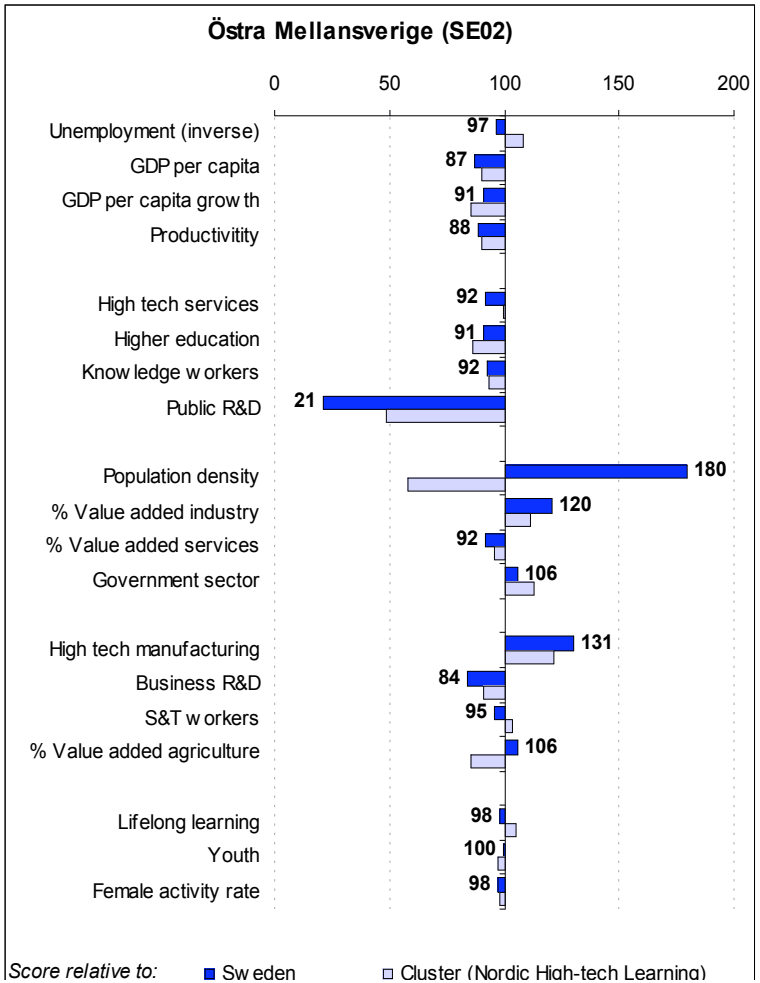
Appendix B Statistical tables and regional scorecards

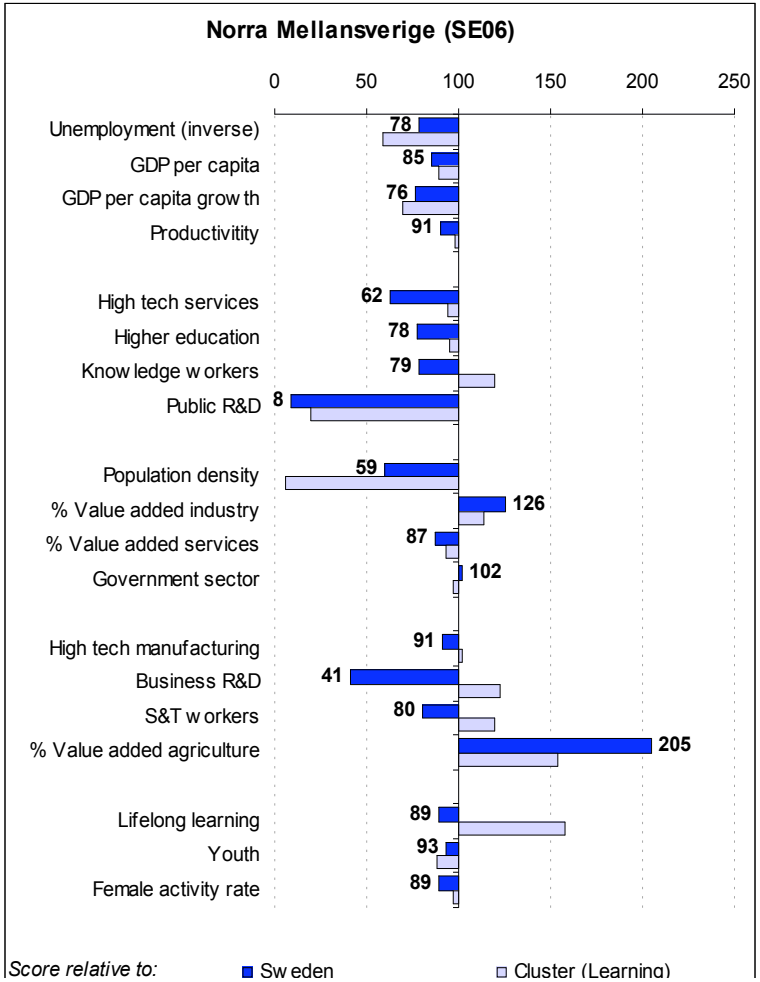
B.1 Overall quantitative analysis per region

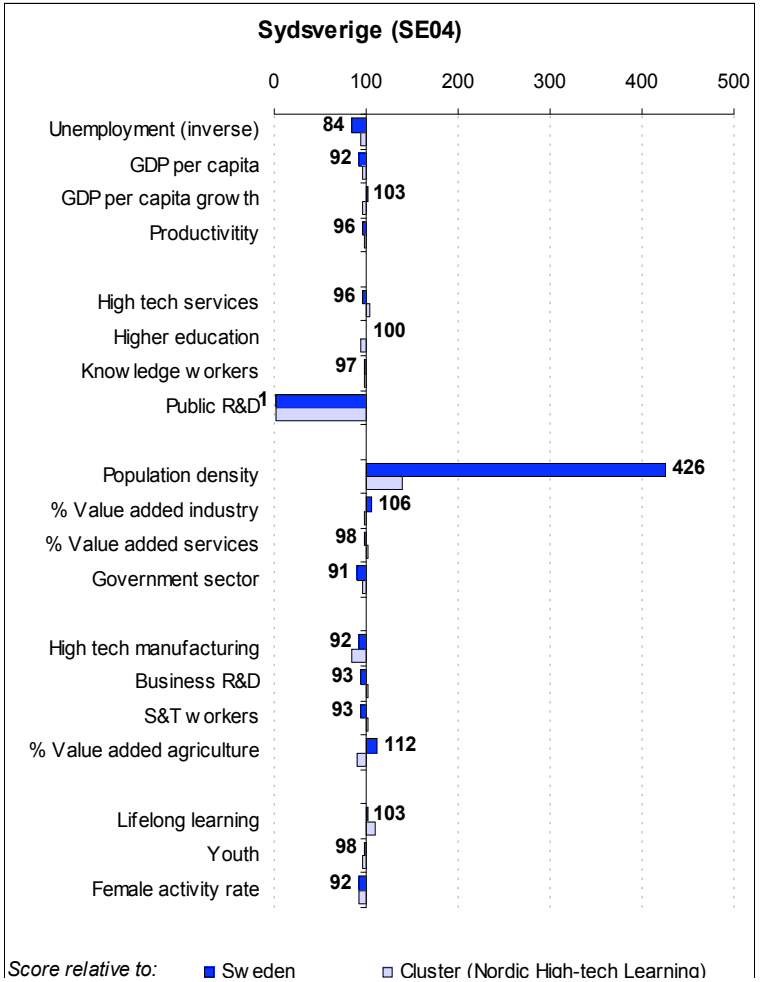
			Economic performance				Public knowledge				Urban services				Private technology				Learning families			Cluster factor scores				
		Cluster	Unemployment	GDP per capita	GDP per capita growth 1996-2002	Productivity	High tech services	Higher education	Knowledge workers	Public R&D	Population density	Value added industry	Value added services	Government sector	tech manufacturing	Business R&D	S&T workers	Value added agriculture	Lifelong learning	Youth	Female activity rate	Public knowledge	Urban services	Private Technology	Learning families	Percapita GDP
			2003	2002	2002	2002	2003	2003	2003	2002	2002	2002	2002	2003	2003	2002	2003	2002	2003	2001	2003					
EU25			9,2	21170	4,8	4556	3,2	20,7	11,6	0,69	117	27,0	70,9	7,5	6,6	1,24	20,7	2,1	8,7	10,8	48,3					
Regional average			9,4	18882	4,8	3914	2,8	18,9	10,7	0,49	294	28,9	66,6	7,6	6,5	0,80	19,5	4,3	7,1	10,5	47,2					
Sweden	SE		5,7	24304	4,3	5307	4,9	27,0	18,9	0,95	22	27,5	70,6	5,7	7,0	3,32	32,8	1,8	26,8	11,6	58,5					
Relative to EU25			161	115	91	116	152	131	162	138	19	102	100	76	107	268	158	87	307	107	121					
Stockholm	SE01	10	5,1	33488	5,1	6741	8,1	36,2	25,1	0,26	284	16,6	83,3	6,7	4,5	4,37	42,9	0,1	28,5	12,3	67,2	2,62	0,43	0,70	3,22	1,93
Östra Mellansverige	SE02	10	5,9	21064	4,0	4695	4,5	24,6	17,5	0,20	39	33,1	64,9	6,1	9,2	2,78	31,3	1,9	26,3	11,5	57,1	0,98	-0,91	0,91	2,00	0,29
Sydsverige	SE04	10	6,8	22466	4,5	5110	4,7	27,0	18,4	0,01	92	29,1	68,9	5,2	6,4	3,10	30,6	2,1	27,5	11,3	53,8	1,35	-0,77	0,35	2,14	0,47
Norra Mellansverige	SE06	1	7,3	20735	3,3	4805	3,0	21,0	14,9	0,08	13	34,7	61,6	5,9	6,4	1,37	26,3	3,8	23,8	10,7	52,1	0,71	-1,11	-0,05	1,45	0,24
Mellersta Norrland	SE07	1	5,6	21946	3,4	4981	4,9	21,4	15,7	0,04	5	29,0	65,2	7,2	5,1	0,29	29,3	5,8	24,8	10,5	51,5	0,96	-0,51	-0,52	1,56	0,40
Övre Norrland	SE08	1	6,8	21022	3,0	4822	3,1	25,4	16,0	0,17	3	31,4	64,9	6,2	4,8	0,94	26,0	3,7	26,6	11,1	51,5	1,07	-0,84	-0,53	1,66	0,28
Småland med öarna	SE09	1	4,4	21817	3,6	4736	2,4	20,6	14,4	0,00	24	36,5	60,1	4,4	8,1	0,66	27,3	3,3	25,2	11,4	59,1	0,65	-1,59	-0,14	1,95	0,39
Västsverige	SE0A	10	4,9	23060	4,5	5010	4,1	26,4	19,1	0,01	61	30,6	68,0	4,9	9,3	5,19	32,9	1,4	27,5	11,8	61,3	1,20	-1,12	1,33	2,53	0,55
Learning		1	4,3	23139	4,7	4900	3,2	22,1	12,5	0,40	216	30,5	66,0	6,0	6,2	1,12	22,0	2,4	15,1	12,2	53,8	0,29	-0,41	-0,04	1,30	0,56
Central Techno		2	7,5	20700	4,0	4884	2,9	18,7	10,6	0,42	182	30,0	66,8	8,2	7,5	0,84	20,7	3,1	6,7	11,2	47,6	-0,38	0,16	0,36	0,25	0,24
Local Science & Services		3	9,2	19852	6,0	3780	4,3	23,6	13,7	0,88	389	22,0	76,2	9,8	4,6	0,79	22,4	1,8	5,9	10,4	46,9	0,52	1,19	0,12	-0,17	0,13
High Techno		4	6,1	25202	3,6	5591	3,1	17,5	10,3	0,58	288	31,7	66,7	7,3	11,9	1,31	22,8	1,6	5,6	9,7	46,4	-0,21	-0,05	1,27	-0,52	0,84
Aging Academia		5	13,3	17508	5,3	3649	2,5	27,4	13,2	0,67	185	30,1	66,9	7,6	6,7	0,57	18,8	3,0	4,8	7,4	46,0	1,24	-0,33	-0,02	-1,48	-0,18
Southern Cohesion		6	10,7	16213	6,3	3082	1,2	14,7	8,2	0,37	66	19,9	70,0	7,5	1,5	0,11	11,2	10,2	3,1	10,0	38,2	-0,25	0,36	-1,66	-0,54	-0,35
Eastern Cohesion		7	14,2	9776	5,3	1230	1,9	12,0	7,2	0,26	113	34,2	61,3	6,6	6,6	0,33	15,9	4,5	4,1	11,0	48,4	-0,88	-0,46	-0,06	0,15	-1,20
Rural Industries		8	10,3	8204	5,6	1120	1,6	14,8	7,8	0,17	62	33,6	52,0	6,0	4,5	0,18	12,9	14,5	2,6	10,1	45,3	-0,03	-1,40	-1,33	-0,46	-1,41
Low-tech Government		9	14,1	18553	4,1	4848	2,3	10,0	6,2	0,55	161	21,2	75,1	12,9	4,2	0,28	16,2	3,7	4,6	10,1	32,4	-1,62	2,00	0,08	-0,61	-0,04
NordicHigh-tech Learning		10	6,4	23323	4,7	5202	4,5	28,5	18,7	0,41	67	29,9	67,9	5,4	7,6	3,05	30,2	2,3	25,0	11,9	58,2	1,49	-0,82	0,54	1,98	0,59
Science & Service Centre		11	6,1	34489	5,3	6663	5,6	28,5	16,8	0,98	2118	16,8	81,2	7,4	3,8	1,00	30,5	0,8	12,8	11,4	55,5	1,82	1,31	-0,22	0,85	2,06

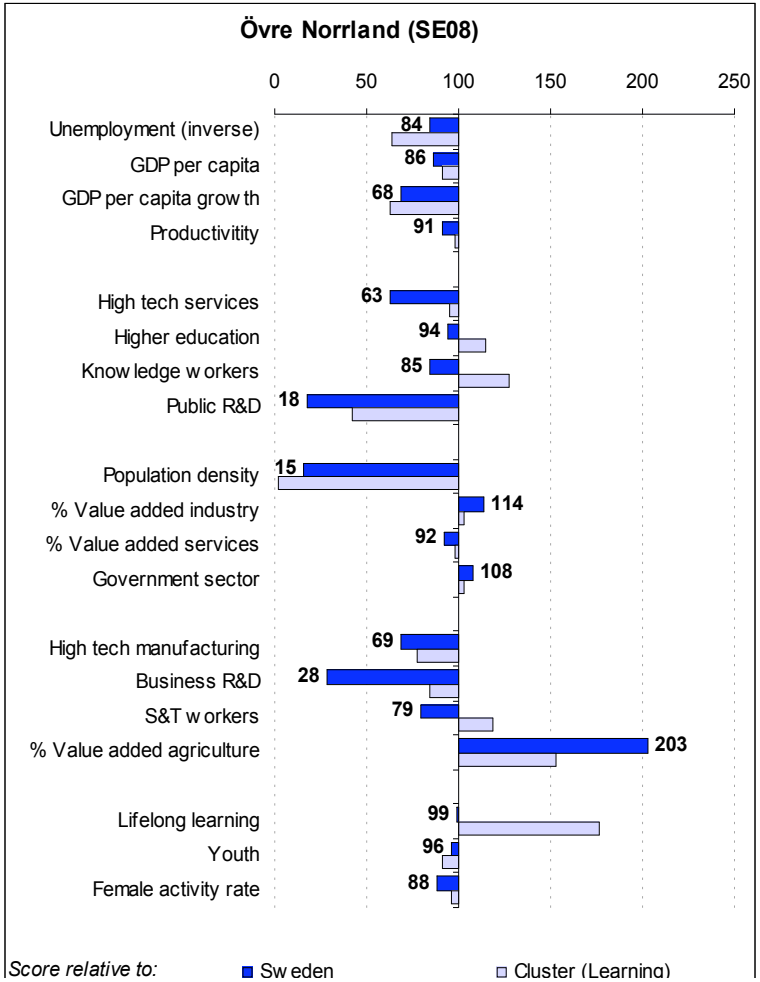
B.2 Regional Scorecards

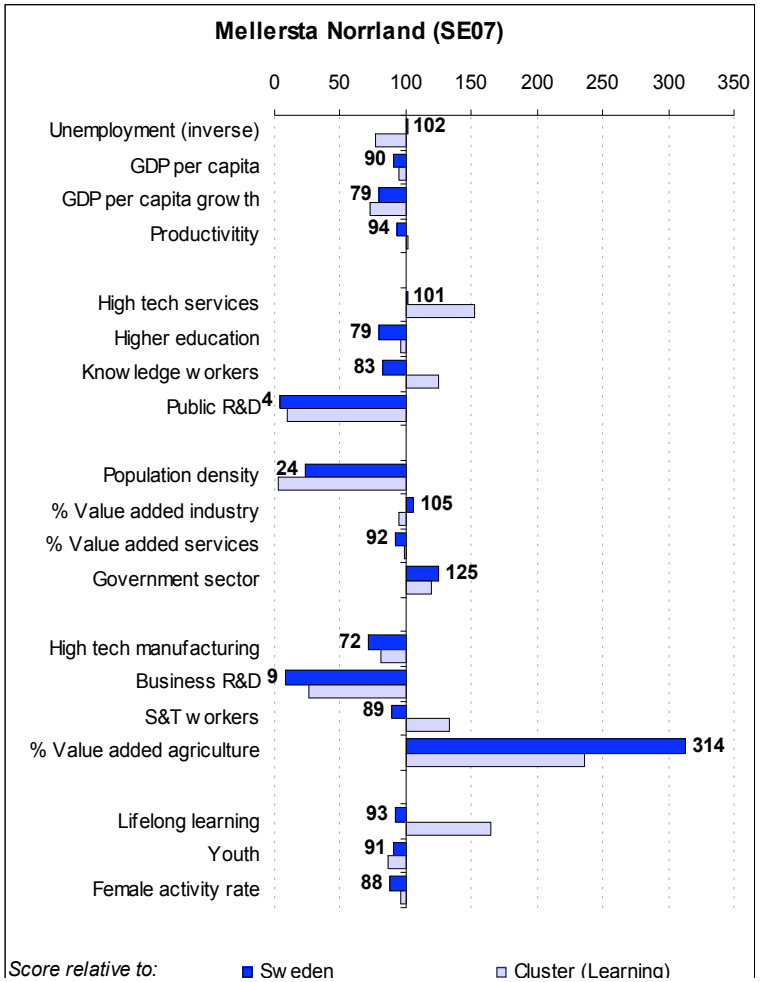


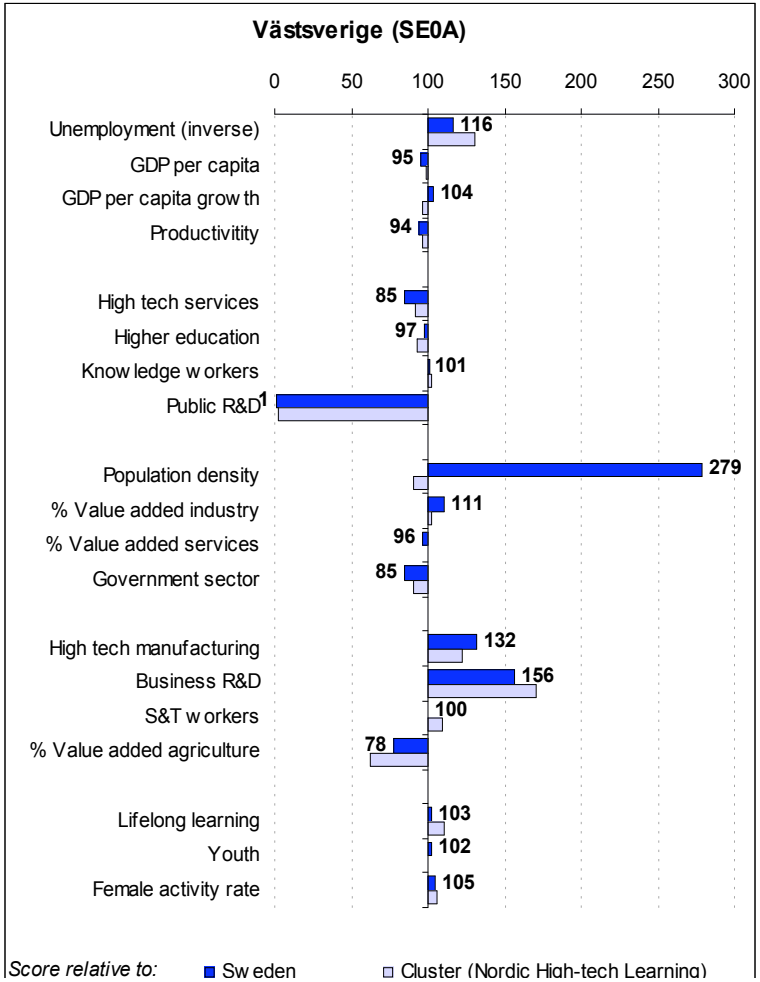


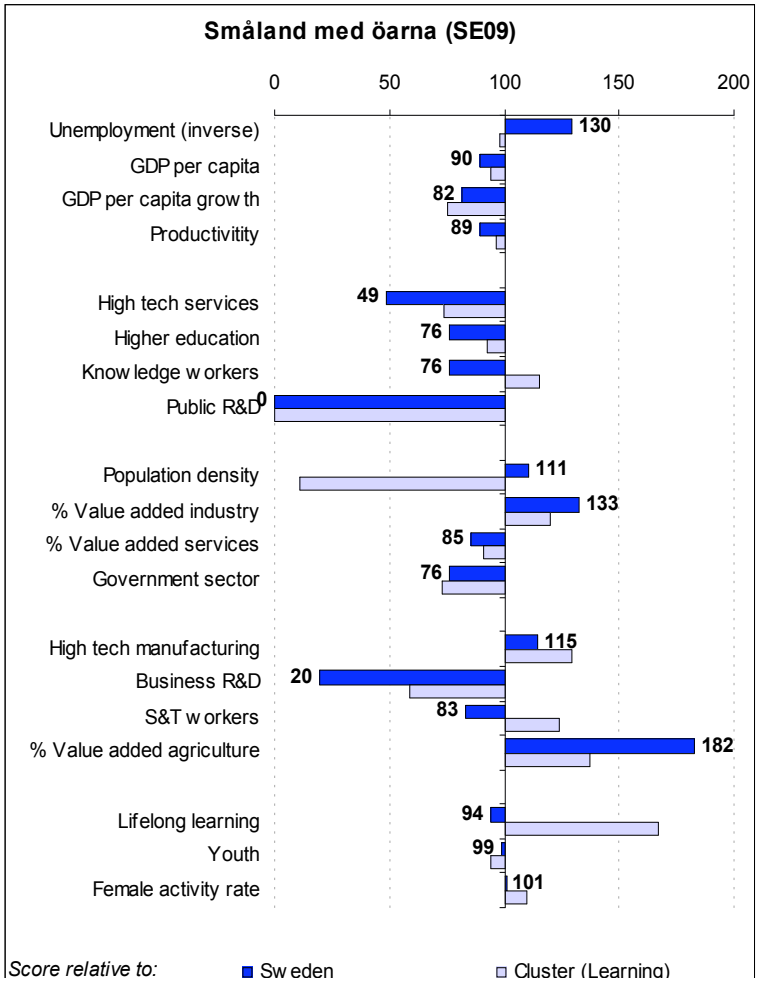

Norra Mellansverige (SE06)
0
50
100
150
200
250
Unemployment (inverse)
78
GDP per capita
85
GDP per capita grow th
76
Productivitity
91
High tech services
62
Higher education
78
Know ledge w orkers
79
Public R&D
8
Population density
59
% Value added industry
126
% Value added services
87
Government sector
102
High tech manufacturing
91
Business R&D
41
S&T w orkers
80
% Value added agriculture
205
Lifelong learning
89
Youth
93
Female activity rate
89
Score relative to:
Sw eden
Cluster (Learning)


Sydsverige (SE04)
0
100
200
300
400
500
Unemployment (inverse)
84
GDP per capita
92
GDP per capita grow th
103
Productivitity
96
High tech services
96
Higher education
100
Know ledge w orkers
97
Public R&D
1
Population density
426
% Value added industry
106
% Value added services
98
Government sector
91
High tech manufacturing
92
Business R&D
93
S&T w orkers
93
% Value added agriculture
112
Lifelong learning
103
Youth
98
Female activity rate
92
Score relative to:
Sw eden
Cluster (Nordic High-tech Learning)


Övre Norrland (SE08)
0
50
100
150
200
250
Unemployment (inverse)
GDP per capita
GDP per capita grow th
Productivitity
High tech services
Higher education
Know ledge w orkers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T w orkers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
84
86
68
91
63
94
85
18
15
114
92
108
69
28
79
203
99
96
88
Score relative to:
Sw eden
Cluster (Learning)


Mellersta Norrland (SE07)
0
50
100
150
200
250
300
350
Unemployment (inverse)
GDP per capita
GDP per capita grow th
Productivitity
High tech services
Higher education
Know ledge w orkers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T w orkers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
102
90
79
94
101
79
83
4
24
105
92
125
72
9
89
314
93
91
88
Score relative to:
Sw eden
Cluster (Learning)


Västsverige (SE0A)
0
50
100
150
200
250
300
Unemployment (inverse)
116
GDP per capita
95
GDP per capita grow th
104
Productivitity
94
High tech services
85
Higher education
97
Know ledge w orkers
101
Public R&D
1
Population density
279
% Value added industry
111
% Value added services
96
Government sector
85
High tech manufacturing
132
Business R&D
156
S&T w orkers
100
% Value added agriculture
78
Lifelong learning
103
Youth
102
Female activity rate
105
Score relative to:
Sw eden
Cluster (Nordic High-tech Learning)


Småland med öarna (SE09)
0
50
100
150
200
Unemployment (inverse)
130
GDP per capita
90
GDP per capita grow th
82
Productivitity
89
High tech services
49
Higher education
76
Know ledge w orkers
76
Public R&D
0
Population density
111
% Value added industry
133
% Value added services
85
Government sector
76
High tech manufacturing
115
Business R&D
20
S&T w orkers
83
% Value added agriculture
182
Lifelong learning
94
Youth
99
Female activity rate
101
Score relative to:
Sw eden
Cluster (Learning)

Appendix C Categories used for policy-mix analysis

C.1 Classification of policy areas

Policy area	Short description
Improving governance capacities for innovation and knowledge policies	Technical assistance type funding used by public authorities, regional agencies and public-private partnerships in developing and improving policies and strategies in support of innovation and knowledge. This could include past ERDF innovative action programmes as well as support for instance for regional foresight, etc.
Innovation friendly environment;	This category covers a range of actions which seek to improve the overall environment in which enterprises innovate, and notably three sub groups: innovation financing (in terms of establishing financial engineering schemes, etc.); regulatory improvements and innovative approaches to public services and procurement (this category could notably capture certain e-government investments related to provision of services to enterprises) ; Developing human capital for the knowledge economy. This category will be limited to projects in higher education aimed at developing industry orientated courses and post-graduate courses; training of researchers in enterprises or research centres[29];
Knowledge transfer and technology diffusion to enterprises	Direct or indirect support for knowledge and technology transfer: direct support: aid scheme for utilising technology-related services or for implementing technology transfer projects, notably environmentally friendly technologies and ITC; indirect support: delivered through funding of infrastructure and services of technology parks, innovation centres, university liaison and transfer offices, etc.
Innovation poles and clusters	Direct or indirect support for creation of poles (involving public and non-profit organisations as well as enterprises) and clusters of companies direct support: funding for enterprise level cluster activities, etc. indirect support through funding for regrouping R&D infrastructure in poles, infrastructure for clusters, etc.
Support to creation and growth of innovative enterprises	Direct or indirect support for creation and growth of innovative firms: direct support: specific financial schemes for spin-offs and innovative start-ups, grants to SMEs related to improving innovation management, marketing, industrial design, etc.; indirect support through funding of incubators, training related to entrepreneurship, etc.
Boosting applied research and product development	Funding of "Pre-competitive development" and "Industrial research" projects and related infrastructure. Policy instruments include: aid schemes for single beneficiary or groups of beneficiaries (including IPR protection and exploitation); research infrastructures for non-profit/public organisations and higher education sector directly related to universities.

[29] This is part of the wider area of in-house training, but in the present study only the interventions targeted to researchers or research functions will be analysed.

C.2 Classification of Beneficiaries:

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

C.3 Classification of instruments:

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

Appendix D Financial and policy measure tables

D.1 Additional financial tables

D 1.1 RTDI plus business (innovation technology) support

A second calculation was made including categories 181 to 184 and additionally:

- 152 Environment-friendly technologies, clean and economical energy technologies
- 153 Business organisation advisory service (including internationalisation, exporting and environmental management, purchase of technology)
- 155 Financial engineering
- 162 Environment-friendly technologies, clean and economical energy technologies
- 163 Enterprise advisory service (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology)
- 164 Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs)
- 165 Financial engineering

In the case of Sweden, this calculation resulted in no changes to the data in exhibits of Section 4.

D 1.2 Broad innovation and knowledge economy funding

A third calculation was made including RTDI and business (innovation & technology) support as well as information society, thus further adding the following to the data in exhibits of Section 4 (see Exhibits D1-D4):

- 322 Information and Communication Technology (including security and safe transmission measures)
- 324 Services and applications for SMEs (electronic commerce and transactions, education and training, networking)

Exhibit D1: Overall allocation of resources at Objective 1 and 2 levels (Euro).

Objective	Total cost	Structural Funds			National Funds	
		Total	ERDF	ESF	Public	Private
RTDI INTERVENTIONS						
Objective 1	292 901 613,90	156 780 868,15	154 965 439,75	1 815 428,40	136 120 745,75	0,00
Objective 2	164 061 560,85	65 191 474,70	65 191 474,70	0,00	98 870 086,15	0,00
TOTAL COHESION POLICY						
Objective 1	1 414 782 584,00	780 000 001,00	489 556 102,00	163 926 122,00	624 909 925,00	9 872 658,00
Objective 2	1 052 255 264,00	440 000 000,00	385 300 193,00	54 699 807,00	612 255 264,00	0,00

NB: *The two-digit code 15 was not taken into account to avoid overestimate (Södra)*
The two-digit code 16 was not taken into account to avoid overestimate (all programmes)
The two-digit code 32 has been included; figures may amount to a slight overestimate

Source: Programming documents and financial data provided by DG REGIO.

Exhibit D2: Regional allocation of resources (Euro).

Programs	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
OBJECTIVE 1						
DOCUP obj 1 Norra Norrlandsregionen	76 186 075,00	74 512 000,00	1 674 075,00	408 053 973,00	259 784 129,00	90 798 366,00
DOCUP obj 1 Södra Skogslänsregionen	80 594 793,15	80 453 439,75	141 353,40	371 946 028,00	229 771 973,00	73 127 756,00
OBJECTIVE 2						
DOCUP obj. 2 Norra	10 598 823,60	10 598 823,60	0,00	192 500 000,00	164 621 351,00	27 878 649,00
DOCUP obj. 2 Öarna	3 846 557,25	3 846 557,25	0,00	31 216 218,00	26 528 718,00	4 687 500,00
DOCUP obj. 2 Södra	18 708 248,00	18 708 248,00	0,00	86 827 637,00	74 227 658,00	12 599 979,00
DOCUP Obj. 2 Västra	32 037 845,85	32 037 845,85	0,00	129 456 145,00	119 922 466,00	9 533 679,00
Total Regional OPs	**221 972 342,85**	**220 156 914,45**	**1 815 428,40**	**1 220 000 001,00**	**874 856 295,00**	**218 625 929,00**

Source: Programming documents and financial data provided by DG REGIO.

Exhibit D3: Absorption capacity of RTDI interventions

OBJECTIVES	ALLOCATED	DISBURSED TOTAL SF	EXPENDITURE CAPACITY
Objective 1	156 780 868,15	102 986 044,43	65,7%
Objective 2	65 191 474,70	42 164 016,51	64,7%

Source: ISMERI.

Exhibit D4: Absorption capacity by field of intervention

CODES	ALLOCATED	DISBURSED	EXPENDITURE CAPACITY
OBJECTIVE 1			
18 - Research, technological development and innovation (RTDI) - detailed information unavailable	98 122 417,20	69 950 124,80	71,3%
32 - Telecommunications infrastructure and information society	58 658 450,95	33 035 919,63	56,3%
TOTAL OBJ. 1	**156 780 868,15**	**102 986 044,43**	**65,7%**
OBJECTIVE 2			
18 - Research, technological development and innovation (RTDI) - detailed information unavailable	26 685 091,76	18 246 228,80	68,4%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	9 896 177,85	6 904 612,51	69,8%
32 - Telecommunications infrastructure and information society	28 610 205,09	17 013 175,20	59,5%
TOTAL OBJ. 2	**65 191 474,70**	**42 164 016,51**	**64,7%**

Source: ISMERI.

D.2 Summary of key policy measures per programme

Exhibit 1: main measures in favour of innovation and knowledge

Identified RTDI measure or major project	Focus of intervention (policy area classification)*	Main instruments**	Main beneficiaries***
Objective 1 NN, measure 2.0 Overall initiatives toward working life	Innovation friendly environment	Infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks
Objective 1 NN measure 3.4 Regional development	Innovation friendly environment	Infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks
Objective 1 SS measure 5.2 Competence development, research and education	Knowledge transfer and technology diffusion to enterprises - direct	Infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks
Objective 1 NN measure 6.3 Competence development, research and education	Knowledge transfer and technology diffusion to enterprises - direct	Infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks
Objective 2 Södra, measure 1.4 R&D, learning centers, competence and development centers	Knowledge transfer and technology diffusion to enterprises - direct	Infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks

Objective 1 NN, measure 1.1 Information technological infrastructure	Knowledge transfer and technology diffusion to enterprises - indirect	Infrastructures and facilities;	Public sector; Private sector
Objective 1 SS, measure 1.5 Information technological infrastructure	Knowledge transfer and technology diffusion to enterprises - indirect	Infrastructures and facilities;	Public sector; Private sector
Objective 1 SS, measure 4.2 Information technological infrastructure	Knowledge transfer and technology diffusion to enterprises - indirect	Infrastructures and facilities;	Public sector; Private sector
Objective 2 Öarna measure 1.5 Business life and infrastructure	Knowledge transfer and technology diffusion to enterprises - indirect	Infrastructures and facilities;	Public sector; Private sector
Objective 1 SS measure 1.1 Development of SMEs and entrepreneurship	Support to creation and growth of innovative enterprises	Innovation friendly infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks
Objective 2 Västra measure 1.1 Development and renewal within business life and entrepreneurship	Support to creation and growth of innovative enterprises	Innovation friendly infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks
Objective 2 Södra, measure 1.3 Development of businesslife and entrepreneurship	Support to creation and growth of innovative enterprises	Innovation friendly infrastructures and facilities; Aid schemes; Education and training	Public sectors; Private sectors; Networks
Objective 2 Norra measure 1.1 Entrepreneurship	Support to creation and growth of innovative enterprises	Innovation friendly infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks
Objective 1 NN, measure 2.1 Support to SMEs	Boosting applied research and product development	Innovation friendly infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks
Objective 1 NN measure 1.3 Research and development	Boosting applied research and product development	Innovation friendly infrastructures and facilities; Aid schemes; Education and training	Public sector; Private sector; Networks

* Classification of RTDI interventions: Improving governance capacities for innovation and knowledge policies; Innovation friendly environment; Knowledge transfer and technology diffusion enterprises; Innovation poles and clusters; Support to creation and growth of innovative enterprises; Boosting applied research and product development (see appendix).

** Classification of instruments: Infrastructures and facilities; Aid schemes; Education and training.

*** Classification of Beneficiaries: Public sector; Private sector; Networks

Appendix E Case study

Name of Case (related policy measure or action)	
Title of project:	The Coaching Circle (MentorRingen)
Description:	A coaching network primarily supporting female innovators having an innovation with commercial potential to find capital and other contacts in order to realise commercialisation, either through already existing producers or new entrepreneurs.
Zone:	Objective 2 South (Mål 2 Södra)
Policy framework:	Support to innovations, offering start-up and spin-off effects
Contact details:	Renée Lindholm ALMI Företagspartner i Kalmar Län Telephone: +46-480-260 19 E-mail: desiree.lindholm@almi.se

Brief history and main features

Policy area

Innovative friendly environment, knowledge transfer and technology diffusion to enterprises, innovation poles (and clusters), support to creation and growth of innovation enterprises, (boosting) applied research and product development.

Main instruments

The main instruments characterising the initiative are e.g. networking and interaction, coaching, knowledge and experience exchange, all in a structured format. The participants are chosen carefully according to a specific model – after a prototype is constructed and the potential market analysed – in order to increase the chances of succeeding within the available time frame.

Main beneficiaries

The main beneficiaries are actors within the private sector. Primarily, innovators get an opportunity to find support to offset their products. Entrepreneurs and SMEs find innovators within a professional format, supported by an organisation, and production may lead to new job opportunities, even though most of the innovations end up in production abroad. Both spin-off and start-up effects have been noticed within the private sector.

Inspiration from previous experience

Desirée Lindholm, who had experience of innovation and turning her idea into a commercial product, initiated the project. The obstacles she encountered gave her the understanding that other innovators really needed support, socially, financially and structurally, in exploiting their ideas; dealing with markets, producers and financiers are demanding. Most innovators are not entrepreneurs, making it complicated for them to understand the culture of the producing industry. Such understanding is now within reach through MentorRingen.

Organisations involved

Organisations involved are SF Objective 2 Södra, Regionförbundet i Kalmar Län (the two largest financial contributors), and local community business agencies such as Emmaboda Kommun, Hultsfreds Näringslivscentrum AB, Mörbylånga kommun,

Vimmerby Vision AB and Västervik Framåt AB. ALMI Företagspartner i Kalmar Län is the contractor.

It took two years of applications and contacting active authorities before the project could be launched, and financing was then secured for two years only, which is perceived to be too short when supporting innovators in exploiting their products, since this can easily take five years.

Structure of initiative
The project is planned for two years, ending in 2007. During this time, coaching circles according to this specific format for supporting innovators should be initiated, a specific number of innovators should exploit their innovations into production. Innovators within hospitals and other service sectors should feel invited; the project should be targeted to this particular sector and innovators within this field should be invited to apply to participate in activities. The project should be marketed within the region (Objective 2 Södra), and 49 lectures will be given in order to reach as many innovators as possible.

Milestones
Crucial milestones for every innovator participating in MentorRingen is when they feel strong and sufficiently independent to introduce their innovation to a representative from the production sector. The culture clash between innovator and entrepreneur is one of the critical issues that must be overcome. Timing, finding a market and securing financing are other critical issues.

Degree of novelty
Offering support to innovators this way, and specifically to high- and low-tech products, is not known to have been done before. In Luleå, there is an organisation supporting female innovators, but not in the same format. The degree of novelty is therefore demed to be high. Country councils offer initial advice to innovators ("Innovationsrådgivare"), but normally there is a gap between these services and final production when the innovator is expected to find the way her-/himself. Here, MentorRingen offers support through a structured programme for networking and access to contacts to facilitate this phase, which should lead to more innovations actually coming into full-scale production.

Main results

Main outcomes
At least twenty innovations waiting to be exploited, of which about five have led to production in less than a year. One innovation is in production in a company recently started by the innovator herself, and the others are in contracts production, both alternatives creating new employment opportunities. Other results are noticeable, such as effects the innovations may have on end users and their environment.

Main evaluation results
Letting someone join the circle at too early a stage, before the prototype exists and the market is analysed (support for this is offered by the Innovationsrådgivare, see above), is destructive both to the specific innovator and to the circle as a whole.

One major evaluation result is that MentorRingen's system is functioning and offering results, but need continued funding after the present two-year period in order to real-

ise expected long-term effects. It needs to be easier to apply for financing through public sectors, such as SF.

Objective fulfilment
Most of the objectives set at the beginning of the planning period will be achieved. Many ideas have been discarded and the number of innovators succeeding in exploiting of their innovations will most likely be exceeded.

Current status
Three circles are up and running, 20 innovators are active, and about half the project duration has passed. As there is only one year left of financing, the time span is too short to start new circles, since a year from prototype to production is too short. The risk of standing there at the end of the year with seven disappointed innovators, without time enough to exploit their innovations and no funding to support the project is not worth taking.

Reasons of success and conditions for repeatability

Why best practice?
In relation to the funds spent, the number of potential start-ups and spin-offs is impressive, and the project offers win-win situations for all actors included. The project is also innovative in itself.

What are the main socio-economic and institutional conditions?
The very same socio-economic factors and institutional conditions calling for the creation of MentorRingen, the difficulties small innovators encounter when trying to exploit their innovations, maybe due to an imperfect institutional structure around innovators, are – when compensated for by the knowledge offered within MentorRingen – tools for success.

What are the main lessons?
The main lesson learned is that support to innovators must be financially prioritised if we want to see new innovations in production, invented by users and other non-academic or non-industrial research actors. Applied research made in order to create a prototype is normally time consuming, and financially non-rewarding.

Have new initiatives resulted?
MentorRingen is an invention in itself and protected as such. Most likely it will inspire new initiatives of similar formats or the same, as knowledge about this way of supporting innovators and the success of it, spreads. It appears that a similar project is being launched in Stockholm.

What is susceptible to be transferred?
Most aspects regarding interactive knowledge exchange and networking with potential producers as grounds for supporting innovators in finding offset for their products.

Constraints to transferability?
None known.

Appendix F Further reading

F.1 Referenced literature

"Ökad konkurrenskraft för svensk processindustri", IVA-M 353, 2006 (downloadable from www.iva.se).

"Samlad lägesrapport per 2005-12-31 avseende strukturfondsprogram och fonder för programperioden 2000-2006", NUTEK, downloadable from www.nutek.se.

"European Trend Chart on Innovation, Annual Innovation Policy Trends and Appraisal Report, Sweden, 2004-2005", European Commission, 2005.

"Key Figures 2005, Towards a European Research Area – Science, Technology and Innovation", European Commission, 2005.

"Diskussionsunderlag: Ett nytt inslag i den regionala utvecklingspolitiken", Department of Industry, Regeringskansliet, 2005.

"Mål 1 Södra Skogslänsregionen 2003-2005, en uppdatering av halvtidsutvärderingen" NUTEK, downloadable from www.nutek.se.

Mål 1 Norra Norrland 2003-2005, en uppdatering av halvtidsutvärderingen" NUTEK, downloadable from www.nutek.se.

"Mål 2 Norra 2003-2005, en uppdatering av halvtidsutvärderingen" NUTEK, downloadable from www.nutek.se.

"Mål 2 Västra 2003-2005, en uppdatering av halvtidsutvärderingen" NUTEK, downloadable from www.nutek.se.

"Mål 2 Södra 2003-2005, en uppdatering av halvtidsutvärderingen", NUTEK, downloadable from www.nutek.se.

"Mål 2 Öarna 2003-2005, en uppdatering av halvtidsutvärderingen", NUTEK, downloadable from www.nutek.se.

"Choosing Strategies for Sweden", synthesis report from the Swedish Technology Foresight project, 2004 (downloadable from www.tekniskframsyn.nu).

"Inspiration for Innovation", report from the Swedish Technology Foresight project, 2004 (downloadable from www.tekniskframsyn.nu).

"Research for a Better Life", government bill 2004/05:80 (downloadable from www.regeringen.se).

"Innovativa Sverige", government White Paper Ds 2004:36 (downloadable from www.regeringen.se).

"Forskning och utveckling i Sverige 2003", Statistics Sweden.

"Svenska klusterkartor, En statistisk inventering av kluster i Sverige 2002", CIND, Uppsala University, 2002.

"Research and Renewal", government bill 2000/01:3 (downloadable from www.regeringen.se).

"FoU och samverkan i innovationssystemet", government bill 2001/02:2 (downloadable from www.regeringen.se).

"Bättre finansiering för kommersialisering av innovationer", government commissioned inquiry (downloadable from www.regeringen.se).

"Uppdatering av halvtidsutvärderingen – Mål 1 Norra Norrland". CC1: 1999 SE 16 DO 001, downloadable from www.mal1.nu.

Programme documents for the programmes operative in Sweden downloadable from http://www.nutek.se/sb/d/145/a/1106.

F.2 List of useful websites

The Government of Sweden, www.regeringen.se.

Swedish Governmental Agency for Innovation Systems (VINNOVA), www.vinnova.se.

Swedish Agency for Economic and Regional Growth (NUTEK),www.nutek.se.

ALMI Företagspartner (ALMI), www.almi.se.

Innovationsbron, www.innovationsbron.se.

Industrifonden, www.industrifonden.se.

Knowledge Foundation (KKS), www.kks.se.

Swedish Foundation for Strategic Research (SSF), www.stratresearch.se.

Appendix G Stakeholders consulted

Individuals interviewed

Name	Position	Organisation
Roland Dahlbäck	Programme Manager	Objective 2 Norra
Jeanette Edblad	Division for Regional Development and Tourism	Ministry of Industry
Inga Greta Ekblom	Programme Manager	Objective 1 Norra Norrland
Hans Hansson	Managing Director	SICOMP AB
Desirée Lindholm	Project Manager	ALMI Kalmar Län
Maria Lindqvist	Project Leader, Visanu project	NUTEK
Tomas Pettersson	Project Administrator	ALMI Oskarshamn
Anders Ridberg	Programme Manager	Objective 2 Västra
Bengt Åke Strömqvist	Programme Manager	Objective 1 Södra Skogslänen
Erik Wennerhag	Programme Manager	Objective 2 Södra
Annelie Wirtén	Programme Manager	Objective 2 Öarna

Participants in focus group meeting

Name	Position	Organisation
Johan Ancker	Senior R&D Director	Association of Swedish Engineering Industries
Stefan Cairén	Deputy Assistant Undersecretary	Ministry of Industry
Sven Cele	Managing Director, Trade matters	Swedish Textile and Clothing Industries' Association
Roland Dahlbäck	Programme Manager	Objective 2 Norra
Fredrik Eliasson	Evaluator	Länsstyrelsen Örebro
Jennie Granat Thorslund	Analyst, Strategy Development Division	VINNOVA
Maria Nilsson	Business Angel Relations	Swedish Private Equity & Venture Capital Association
Thomas Nordström	Innovation Actors Division	VINNOVA
Olle Persson	Senior Adviser, Project Development	Fiber Optic Valley