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

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Executive Summary

This report has analysed the Structural Funds intervention in favour of innovation and knowledge in the period 2000-2006 in the UK regions. The different regional operational programmes have largely used funds in promoting research and development, but particularly in different forms of business support for small and medium enterprises. The report has discussed the implication of this intervention for the innovation capacity in British regions analysing the several Single Programming Documents and Mid-Term Evaluations, and discussing the topic with stakeholders from different regions. They also suggest strategic orientations for the next intervention and guidelines to maximise the use of Structural Funds in the period 2007-2013.

The UK has no overarching strategy for the deployment of Structural Funds in the area of innovation, but it relies on regional programmes. In the period 2000-2006, Structural Funds have financed six Objective 1 programmes and 14 Objective 2 programmes. The Objective 1 areas, Merseyside, Cornwall, South Yorkshire, West of Wales, Northern Ireland, and Highland and Islands, have a poor research base, start-ups rate lower than the rest of the UK, and unemployment rate higher than the rest of the country. The remaining regions are part of the Objective 2 programme and they include advanced areas such as London and South East.

Considering only initiatives related to research and development, the share of Structural Funds intervention in the UK is around 6%. However, if different forms of business support are included this percentage changes dramatically. Thus, considering the term innovation in a broad sense, the share of Structural Funds intervention is around 30%. This data suggests also that all the regional operational programmes have paid a great attention to support SMEs. This support has been two faces. On one side, Structural Funds has been used to give loans, financial assistance, and marketing consultancy to innovative enterprises. On the other side, they have been used to promote research and development in SMEs through collaboration with universities, creation of clusters, and mechanisms of knowledge and technology transfer from universities to SMEs.

This strategy has brought good results also in difficult areas such as Merseyside, Northern Ireland, and West of Wales. In fact, incubation centres in Northern Ireland, the International Digital Media Centre in Merseyside, and the Technium incubation centres in Wales are some successful examples of promotion of innovation and networking between local universities and SMEs. It is believed that this strategy is a good base for the Structural Funds intervention in the period 2007-2013, which needs to be focussed on promoting research in SMEs, developing knowledge transfer mechanisms and improving the existing ones, enhancing commercialisation of research in universities, diffusing and sustaining entrepreneurial culture in the business system and in the universities, and improving networking capabilities within regions. The next intervention should be focussed on ‘social engineering’ initiatives, using a term suggested by stakeholders, in order to enhance the innovation attitude in the regional actors.

The effectiveness of this strategy can be maximised if regulations are made clearer, easier to adopt, and flexible. It is believed that excessive regulation is a burden for the implementation of Structural Funds and risk to stop creative ways of use them. Simplifying requirements can be also achieved through a better coordination among different bodies involved in the Structural Funds interventions. In this term, the alignment to the regional innovation strategies is crucial and a major coordination among regional bodies is desiderable through a more extensive use of partnerships. Finally, it is also important to make the difference between ESF and ERDF less rigid and promoting a synergic and easy interaction between Structural Funds and Framework Programmes.

This report is organized in five sections. The first section will provide a comparative overview of innovation capacity in the UK at national and regional levels. The second section will analyse the institutional context of the British innovation governance discussing the main bodies and policies involved in innovation and knowledge policies in the UK. The third section will describe the Structural Funds intervention in the period 2000-2006. The focus of the section will be on measures in favour of innovation, their performance and their effects at national and regional levels. The fourth section will highlight the factors enabling innovation in the regions suggesting areas of interventions. The last section will summarise the Structural Funds orientations suggested by different stakeholders from the central government agencies and bodies, and from the regional authorities.

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 guideline 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 business grow and operate. Developing 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.

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[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.

Structural Funds are the main Community instruments to promote economic and social cohesion. In the past and current programmes, they have contributed to enhance the research potential and innovation in businesses and to develop 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.

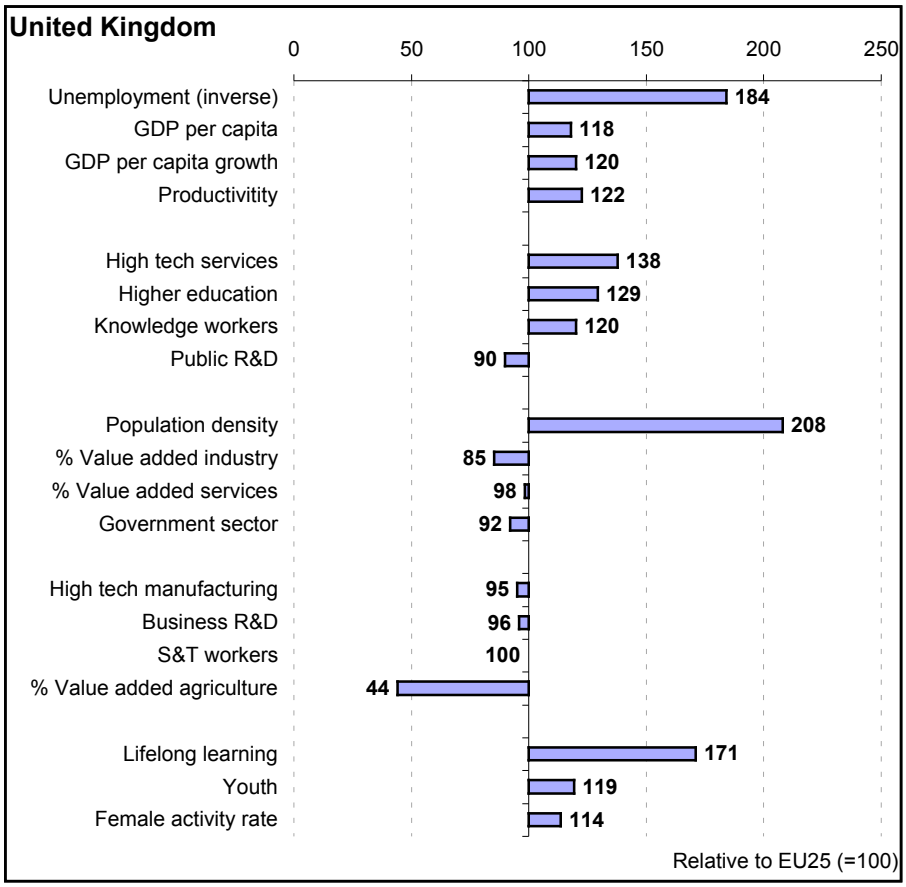
2 Investing in innovation and knowledge: a comparative overview of regional performance

This section provides an overview of the relative performance of the UK, and its 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 (see sections 5 and 6 of this report).

2.1 Country overview: innovation and the knowledge economy

Exhibit 1 shows the position of the UK compared with the EU-25 average on a series of key indicators. The UK is ahead of the EU-25 average on 11 of the 18 indicators and at, or close to, the EU average on five others. The strongest positive differences are population density, unemployment and lifelong learning. High tech services and higher education also record results significantly ahead of the EU average. It performs least well on the indicator '% value-added in agriculture,' which reflects the strong differences between the UK's economic structure and others in Europe.

Exhibit 1 UK relative performance for key knowledge economy indicators 2000-2005



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.

The indicators are grouped into five sets, and at this level, the analysis reveals the UK to perform best on the first two sets of indicators, economic performance and public knowledge, and the fifth set of indicators, to do with learning and families. The UK performs least well on the fourth group of indicators, which the study has named 'private technology.'

The basket of indicators suggests a mixed picture in terms of UK innovation performance, with below average scores for traditional indicators such as business expenditure on R&D but above average performance on higher education and knowledge workers.

Mediocre performance on the chosen innovation indicators is accompanied by strong performance on the economic indicators. This apparent anomaly may be explained in part by the mismatch between conventional innovation indicators and the structure of the UK economy, which is relatively weak in high-tech manufacturing, the area of the economy where it is typical to invest heavily in R&D, while being relatively well endowed with high-tech services, where innovation is pursued through other means than R&D.

The UK has experienced rapid growth in many knowledge-intensive services. Even in retailing there have been many innovations in the way shops are built, organised and run, but these have mainly involved changes in store format and design (e.g. bigger stores), in processes (supply chain management) or the introduction of information and communication technology (ICT) for stock control and logistics. Other examples of dynamic sectors include the "creative industries", an area of comparative strength both in terms of employment and export performance, where commercial exploitation of new ideas is an integral part of the activity, but is not well reflected in conventional measures of innovation.

It can be explained also by UK macroeconomic strengths, which the OECD recently called a paragon of stability: GDP growth has remained closer to potential than for almost any other OECD country; the unemployment rate has fallen to its lowest level and has been the least volatile since the 1970s; and inflation has remained stable and close to the official target. The exchange rate is amongst the most stable in the OECD and more stable than for the euro zone countries. Moreover, the UK is believed to enjoy some of the most favourable Framework Conditions in Europe, if not the world (e.g. availability and cost of finance, interest and exchange rates, product market regulation, labour market flexibility, international openness, etc), which suggests that there are few specific policy interventions necessary here.

In 2003, the UK's gross domestic expenditure on R&D (GERD) was 20,825 MGBP, which was an increase, in cash terms, of around 5%, and 2% in real terms. In 2003, R&D expendure remained broadly stable for the past several years at 1.86% of gross domestic product (GDP), and following a 15-year period of decline (it was around 2.4% of GDP in 1980). The long-run downward trend in the UK contrasts with the upward trend for the OECD and EU15, although recent years have seen a reversal with EU and OECD investment levels showing signs of stagnation or even decline.

The UK's low country ranking also holds for R&D performed in the business sector, which is usually identified as being the most effective in raising growth performance.

R&D intensity outside the business sector is also relatively low, although this is due to low R&D intensity performed in the government sector whereas that performed in the higher education sector is on a par with most other OECD G7 countries.

The decline in R&D intensity can be accounted for by the decline in government performed R&D and government funding of business R&D, and in particular the decline in government outlays for defence R&D. In the past five years, there has been a slight further decline in government and industry funding mostly compensated by increased funding from abroad, with the latter currently financing over one-quarter of BERD, a much higher share than in any other G7 country.

BERD intensity is low in part because of industrial mix, so for example the economy is relatively strong in high-tech services and oil and gas (low R&D intensity) and less present in manufacturing. While the share of high-technology manufactures (including pharmaceuticals and office, computer and communications equipment) in gross value added is not far behind Japan and the US, the UK is a long way down the world order in medium-high-technology manufactures (including electrical machinery, motor vehicles and other transport equipment). In several of these latter categories, the UK has maintained an important presence in world markets through foreign direct investment, with research and product development activities remaining to some extent in the host economy (location of headquarters).

Patent-based indicators provide another classic innovation measure, this time related to innovation or R&D output, and here again the UK has performed poorly compared with its major competitors. Of course, patents are indicators rather than measures (individual patents can differ considerably in both utility and value, within sectors and across sectors) and are more prevalent as part of an IP strategy in certain industries than in others. Survey evidence generally suggests that UK firms do not place great emphasis on formal methods of intellectual property rights (IPR), preferring informal methods because they are more cost effective. The number of triadic patents per capita is well below that in the United States, Japan, and Germany. This measure of the propensity to patent has barely increased, again in contrast with the experience of most other OECD countries.

Despite a large science base the share of researchers in total employment is relatively low and employers report difficulties recruiting qualified scientists and engineers, particularly in engineering although this may be as much to do with traditional employers' inability to match the employment *package* offered by employers in some of the faster growing services and media sectors. The UK has a relatively small number of private-sector researchers, suggesting perhaps higher levels of productivity in development or a greater emphasis on more costly and capital intensive experimental development and prototyping (less R more D).

In 2004, three UK government departments (finance, industry and skills) jointly published a 10-year 'Science and Innovation Investment Framework 2004-2014'[3], which includes a number of important innovation 'ambitions' including

[3] www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm

- Maintain world ranking, second to US, on research excellence
- Increase links between public research sector and socio-economic activity
- Increase business investment in R&D, from 1.25% towards 1.7%
- Improve supply of scientists and engineers by improving science careers and tapping new labour markets (women, ethnic minorities, foreigners)

The targets to raise BERD and GERD, from the current level of 1.9% to 2.5% of GDP by 2014, are made in deference to the EU agreements signed at Lisbon and endorsed at Barcelona. Most commentators view these as motivational statements and few expect the UK to even come close to realising such ambitious targets: they amount to a 25% increase in effort over current levels and, critically, a reversal of a trend decline in both R&D investment and R&D spending industries (industrial mix).

The OECD suggests a number of measures the UK government might consider in order to further improve its economic performance going forward, two of which relate directly to innovation

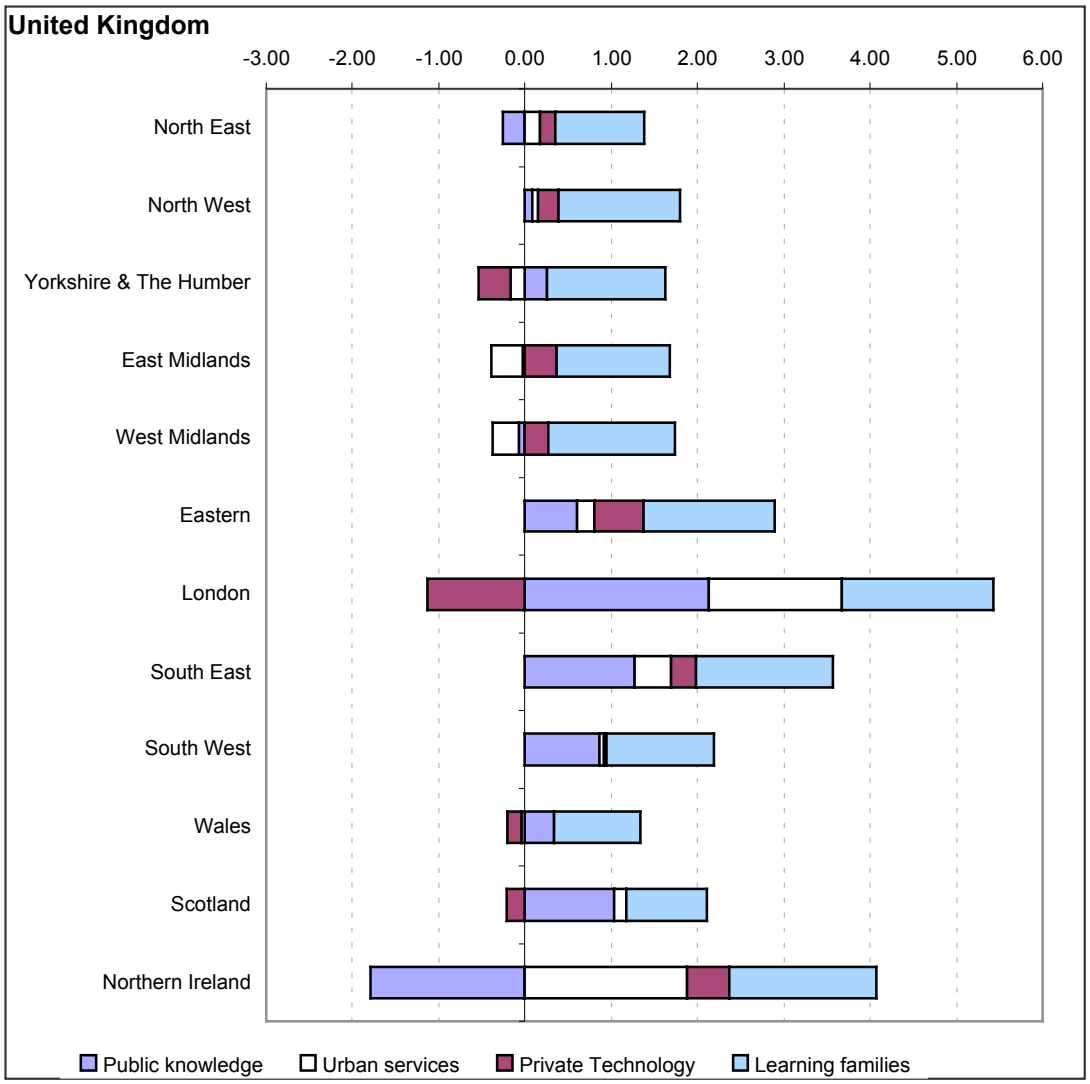
- Raise general skill levels of the workforce, to improve ability to adapt/adopt innovations and boost productivity
- Support innovation with policies tuned to the industrial mix and internationally open economy
- Improve transport infrastructure
- Improve labour utilisation by increasing return to work rates
- Improve efficiency of public services to contain the growing tax burden

2.2 Regional disparities and recent trends

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 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. 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
- 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-life-style' based on behavioural norms and values beneficial to a knowledge economy

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.

Exhibit 2 presents the results of this factor analysis for the 12 UK regions and echoes the strong overall performance for the country as a whole, as compared with the EU average. While performance overall largely exceeds the EU25 average, as one might expect for any of the larger, long-standing EU member states, the factor analysis also reveals a high degree of variability among regions as regards the factor mix and indeed the performance/prevalence on the individual factors, with performance on 'private technology' showing perhaps the greatest variance. The factor profile and performance registered for the South West for example, could hardly be more different to the picture arrived at for London.

In a second step, the 200 plus EU27 regions were grouped into 11 types of regions by MERIT (see appendix A) displaying similar characteristics by means of a cluster analysis. In the case of the UK, its 12 regions are classified to four of the 11 regional types, as follows

- Nine category 1 regions or 'learning regions,' which are the North West, Yorkshire & Humber, East Midlands, West Midlands, Eastern, South East, South West, Wales and Scotland
- One category 2 region or 'central Techno,' which is the North East
- One category 9 region or 'low-tech government,' which is Northern Ireland
- One category 11 region or 'Science and Service Centre,' which is London

Learning regions
The majority of the 12 UK regions fall into this category, which is to say the regions are characterised by a high score on the factor 'Learning Families' while being close to the EU regional average on the other three factors. Other notable features include

- Unemployment is low compared with the EU regional average
- Employment in the government sector is limited
- GDP per capita is rather high
- BERD is slightly above the EU average

There are strong differences on many of the lower-level indicators however, across this sub-group of eight UK regions, which relate to the inherent innovativeness of the regional economies.

- GDP per capita ranges from 27 KGBP (40 KEUR) in the South East to a low of 19 KGBP (28 KEUR) in Wales, with broadly comparable growth rates of 5-6%
- BERD as a percentage of GDP ranges from a high of 3% in the Eastern region to a low of 0.46% in Wales, an order of magnitude difference
- Public expenditure on R&D as a percentage of GDP ranges from a high of 0.9% in Scotland to a low of 0.33% in the West Midlands, and HERD ranged from a high of 0.69% in Scotland to a low of 0.24 in the South West. Government expenditure is concentrated on the South East, reflecting the location of major public sector research establishments and former government laboratories
- Patent applications range from a high of 204 per million inhabitants in the South East to just 68 in the Eastern region, even though the latter recorded BERD intensity 50% higher than the South East, the second placed region. All regions registered growth in patent applications, from a high of 11% in Wales to a low of 4% in the Eastern region
- The proportion of knowledge-based businesses (OECD definition) in the regional economy ranged from a high of 27% in the South East to a low of 14% in Wales, however recent growth (1997-2003) has been strongest in the lower ranked regions and most notably in Scotland and the West Midlands (3.7% and 3.8% CAGR respectively)
- High-tech manufacturing as a percentage of GDP ranges from a high of 10% in the West Midlands to a low of 5% in Yorkshire and Humber
- Population density ranges from a high of 421 people per hectare in the South East to a low of 46 people per hectare in Scotland
- Regional exports per head of population ranged from a high of 3.56 GBP in the South East to a low of 1.82 GBP in the South West, the variation in imports is greater with the South East at 6.76 GBP and Scotland at 1.63 GBP

- The number of companies listed on the London stock exchange ranged from a high of 261 in the South East, with a market capitalisation of 170 bln GBP and a low of 21 in Wales, with a market capitalisation of 1.4 bln GBP, two orders of magnitude lower

There are also differences in the technological orientations of the regions: computer science and electronics in Yorkshire and the Humber, North West, North East, South East, and East of England; nanotechnologies, biotechnologies in Scotland, South East; automotive and aerospace in West and East Midlands and Wales; pharmaceuticals in South East and East.

Central Techno

This is a large group of regions located mostly in Germany and France with close to average performance across the basket of MERIT indicators, although the share of high-tech manufacturing is somewhat higher than the EU average.

We find just one of these regions in the UK, which is the North East, which perhaps sits at the lower end of the scale for these regions on both the key economic indicators (e.g. GVA per head, weekly pay and economic activity rates) and on the knowledge economy indicators. The North East is the smallest of England's nine administrative regions in terms of population and, with the exception of London, is the smallest geographically. The region's economic performance has been one of relative decline during the later decades of the 20th Century, as indicated by the growing 'productivity gap' between the North East and the UK national average. This reflects a variety of complex factors including the capacity of the region to respond to the growth of globalisation and the decline of heavy industry (shipbuilding, steel, petrol-chemicals, etc). There has been some restructuring and a renaissance in medium-tech manufacturing following inward investment by Nissan, but also development in emerging technologies such as nanotechnologies, biotechnologies, green technologies, and encouraging creative industry.

While progress in absolute levels of economic performance has been positive, performance in comparison with other UK and international regions has been poor. Over the last decade, the North East was one of the slowest growing regions of the United Kingdom, and levels of prosperity are now among the lowest in the country. There is significant geographic variation within the region in terms of economic activity, with concentrations of areas of severe deprivation, poor health, and high rates of unemployment and economic inactivity.

The region is undergoing a long term restructuring of the economy and positive signs, are emerging in areas such as automotive manufacturing and defence. However, the economy remains fragile and there is a need to consolidate and accelerate the restructuring process and ultimately progress towards the UK average of key economic indicators will require both wholesale restructing of the region's industrial base and a dramatic transformation in its demographics and levels of active participation in the economy. With European enlargement, the challenge of globalisation may enter a new phase.

The North East is performing poorly in comparison with other regions in the MERIT central techno cluster and in comparison with the UK average, and ranked

- 11th of 12 UK regions on the regional proportion of knowledge based businesses in 2003, with around 15% as compared with an upper level of 29% for London and a UK regional average of 21%
- 11th of 12 UK regions on patent applications per million inhabitants, with around 65/million as compared with an upper level of 204/million for the South East and a UK regional average of 128
- 12th of 12 UK regions on regional R&D expenditure by business enterprises as a percentage of GDP in 2003, at around 0.37% as compared with an upper level of 3% for the Eastern region and a UK regional average of 1.19%
- 12th of 12 UK regions on regional R&D expenditure by government as a percentage of GDP in 2003, at around 0.02% as compared with an upper level of 0.32% for the Eastern region and a UK regional average of 0.22%
- 12th of 12 UK regions on regional business start up rates per 1,000 inhabitants, at around 1.8 as compared with an upper level of 5 for London and a UK regional average of 3.2. Regional business density, number of businesses per 1,000 inhabitants, is similarly low at around 17.9 compared with a regional average of 30.4 and a high of 39 in London

Low-tech government

The third type of MERIT region has been named 'low-tech government,' with this grouping of regions mostly located in southern Italy, and with just one such region in the UK, which is Northern Ireland.

These regions are characterised by a very low score on 'Public Knowledge' factor 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.

Northern Ireland does differ somewhat from the MERIT cluster, in that it has a much higher share of government employment than the EU average (2.5 times) and close to double the share for the low-tech government cluster, which is the result of earlier regional policy measures by UK government. Moreover, formally, unemployment is rather less of a problem in the region and the statistics appear somewhat better than do those for several other UK regions and far better than the situation in Italy. However, rates of economic activity are close to the bottom of the league for the 12 UK regions, at around 70%, and between these two different indicators one can see that the region suffers with a large proportion of people being unavailable for work rather than unemployed.

The region sits at the bottom of the UK rankings when it comes to indicators of both the knowledge economy and innovation more generally, with very low scores on high-tech manufacturing, high-tech services and knowledge workers. The region performs poorly on the related innovation indicators of BERD, patent applications and S&T employment.

The region's economic development strategy places greater emphasis on social cohesion than it does on innovation, for obvious and historical reasons, and its 'competitiveness' agenda is concerned firstly with increasing the level of education,

skills and employability within the region. Northern Ireland is also experiencing a good growth of aerospace, nanotech, and shipbuilding clusters.

Science and Service Centre

The main characteristics of this MERIT grouping of urban regions are the high scores on the Public Knowledge and Urban Services factors. Population density is very high. This regional type also has the highest levels of GDP per capita and productivity as well as high-tech services, however they register relatively poor scores on indicators to do with high-tech manufacturing and business R&D intensity.

London is the only UK region that falls into this category. The region, which is geographically very small, registers scores on key economic indicators and knowledge economy indicators that place it well ahead of the UK average and in several cases well ahead of the second placed region. For example,

- GVA per head at 21 KGBP in 2002, was close to double that for Wales, the North East and Northern Ireland
- Regional productivity at 115 was almost a third higher than that for the lowest region, Northern Ireland (84), and 15% higher than the average for the UK overall
- Gross weekly pay at 640 GBP was close to double the salary levels in Northern Ireland, at 390 GBP
- The proportion of knowledge-based businesses at around 29% was around 40% higher than the UK average
- While BERD intensity is low at 0.46% and arguably overstated by the presence of certain large headquarters with no operational/research capacity in the capital, and less than half that for the UK overall, the region is ranked second on university R&D expenditure, reflecting its hosting of several world class institutions such as Imperial College or the London School of Economics. It ranks fifth on government expenditure on R&D, reflecting the continuing high levels of employment in government policy and specialist staff at HQ locations in the greater London region

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
		%-pnt ch.	% growth	%-pnt ch.	%-pnt ch.	% growth	%-pnt ch.	%-pnt ch.
EU25		--	--	--	--	--	--	--
United Kingdom		-3.00	5.72	-5.64	-0.79	0.87	5.52	-0.09
North East	UKC	-4.70	4.89	-6.21	-0.37	-2.64	4.47	-0.20
North West	UKD	-3.70	5.45	-6.34	-0.54	-1.78	3.24	0.15
Yorkshire & The Humber	UKE	-3.60	5.42	-5.47	-1.03	-0.93	4.30	0.06
East Midlands	UKF	-4.20	4.77	-7.55	-1.14	2.00	3.35	0.26
West Midlands	UKG	-2.90	5.09	-7.97	-0.84	-0.29	5.37	-0.38
Eastern	UKH	-4.70	5.30	-5.38	-1.29	2.64	4.53	-0.17
London	UKI	-1.30	6.51	-3.33	-0.02	4.53	11.00	-0.10
South East	UKJ	-1.70	6.61	-5.24	-0.66	2.04	5.74	-0.50
South West	UKK	-3.50	5.61	-4.50	-1.64	2.57	4.29	0.19
Wales	UKL	-3.90	4.72	-7.58	-0.62	0.00	4.64	0.25
Scotland	UKM	-2.70	4.99	-6.45	-0.81	-1.52	7.57	0.39
Northern Ireland	UKN	-6.90	5.57	-1.57	-3.13	1.78	4.82	0.19

Source : MERIT based on Eurostat data for period indicated

2.3 Conclusions: innovation and knowledge performance

The exhibit presents a summary of the main points on which each of the groups of regions differ from the EU and UK average, with a second column talking about potential needs and opportunities as regards support for innovation and the knowledge economy going forward.

Exhibit 4: summary of key disparities and needs per region in the UK

Region / group of regions	Key factors explaining disparity of performance (weaknesses)	Key needs in terms of innovation and the knowledge economy
Learning regions	• Several of the UK regions within this group perform poorly on R&D indicators, reflecting industrial mix • Relatively weak on high-tech manufacturing	• Use different indicators, to capture strength in services and international trade • Review priorities/emphasis within innovation policy, looking for better balance between high-tech manufacturing and internationally trade services and even public services • Support/facilitate ongoing transition in industrial structure
Central Techno	• The North East is a small region at the margins of the EU, which records average to poor performance on most economic and innovation indicators reflecting long-run decline in its predominantly traditional heavy industry	• Support/facilitate ongoing transition in industrial structure • Upgrade education and skills, as a means by which to strengthen the capacity of local industry to evolve • Enhance return to work policies
Low-tech government	• Northern Ireland (NI) is a peripheral region to both the UK and the EU • It continues to struggle with high levels of social dislocation and exclusion • NI records average to poor performance on most 'economic' and 'knowledge economy' indicators reflecting both problems with industry structure (long-run decline in its predominantly traditional heavy industry such as shipbuilding) and social conflict • High-levels of government employment, created as part of earlier regional policy regimes, have done little to improve working opportunities	• Continue to improve social cohesion • Support/facilitate ongoing transition in industrial structure • Upgrade education and skills, as a means by which to strengthen the capacity of local industry to evolve • Enhance return to work policies
Science and service sector	• London registers low levels of high-tech manufacturing and low levels of BERD, as compared to the EU and UK average	• Use different indicators, to capture strength in services and international trade

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

3.1 Institutional and legal framework for innovation and the knowledge economy

This sub-section of the report reviews two aspects of the national and regional innovation system, which bear on policies in favour of innovation and knowledge

- 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

In the UK, it is the industry ministry, the Department of Trade and Industry (DTI), which takes the lead in the process to define and implement government policy in the area of innovation. That policy is defined in consultation with a wide-range of stakeholders, from other government departments to representatives of business to the economic development agencies of the regions and devolved administrations.

UK innovation governance arrangements are described at some length in two recent national policy documents, which are Chapter 5 of *Competing in the global economy: the innovation challenge* (DTI, December 2003) and Chapter 8 of the *Science and Innovation Investment Framework 2004-2014* (DTI with HM Treasury and Department for Education and Skills, July 2004). These key policy documents also present an overview of the many and various government policies that have a bearing on innovation more generally, from macroeconomic stability to public procurement to best-practice programmes. We have not repeated the discussions here, as innovation governance is a substantial topic in its own right and of limited relevance to our present purpose. In the UK at least, Structural Funds do not figure prominently in the national debate on innovation policy, rather the interplay between structural funds and innovation has been played out at the regional or local levels, rather than nationally, with the government offices and regional development agencies taking the lead.

Exhibit 5 presents a list of the national and regional bodies with an interest in both innovation and structural funds. For the time being, the key players are the DTI, the devolved administrations in Northern Ireland, Scotland and Wales, and the eight English regional development agencies.

Exhibit 5: main organisations per policy area

Policy are	National (&/or regional) public authorities and agencies	Key private or non-profit organisations
Innovation Governance	• Department of Trade and Industry (DTI) • Office of Science and Technology (OST) • Welsh Office • Northern Ireland Office • Scottish Executive • Government Offices in the regions (e.g. GONW)	• UK Technology Strategy Board • Council for Science and Technology (CST) • Royal Society
Innovation Environment	• DTI • Her Majesty's Treasury (HMT) • UK Trade and Investment (UKTI) • OST • Department for Education and Skills (DfES) • Department for Work and Pensions (DWP) • 12 devolved and regional Development Agencies (e.g.Welsh Development Agency [WDA] or London Development Agency [LDA])	• Business Link Operators (BLOs) • Bank of England
Knowledge transfer	• DTI • UKTI • Small Business Service (SBS) • OST and the Higher Education Funding Councils (e.g. HEFCE) • Regional Development Agencies • 8 national research councils • Public Sector Research Establishments (PSREs)	• Association for University Research and Industry Links (AURIL) • The University Companies Association (UNICO) • The Association of University Research Parks (AURP) • Association of Research and Technology Organisations • Business Link Operators (BLOs)
Innovation Clusters	• DTI • Regional Development Agencies	• Business Link Operators (BLOs)
Innovative enterprises	• DTI • UKTI • Small Business Service (SBS) • OST and the Higher Education Funding Councils (e.g. HEFCE) • Regional Development Agencies	• Business Link Operators (BLOs)
Boosting R&D	• DTI • Regional Development Agencies • HM Treasury • Inland Revenue	• Business Link Operators (BLOs)

Source: study team based on national/regional policy documents, TrendChart reports, OECD reports, etc. See appendix C for a detailed definition of the policy categories.

As with all UK government departments, the DTI is committed to a number of public targets, or Public Service Agreements (PSAs), by which its performance will be measured, and decisions made on future funding by the finance ministry. Of its 12 PSAs, PSA Target 2 is concerned specifically with innovation.

DTI PSA2. Improve the relative international performance of the UK's science and engineering base, the exploitation of the science base, and the overall innovation performance of the UK economy. http://www.dti.gov.uk/about/psa/psa_target_2.htm

This target is to be achieved in part through the work of the DTI nationally and in part through the work of the economic development agencies in the regions, governed through what is known as a Tasking Agreement between the DTI and the individual

regional agencies. The framework includes specific 'innovation' commitments, for example, to increase levels of innovation, to increase R&D expenditure by business and to increase linkages between business and the knowledge base.

The DTI and the regions are tracking performance on a number of indicators, with the help of the Office of National Statistics and periodical surveys such as the Community Innovation Survey:

- Share of UK (or regional) businesses that are innovation active
- Share of qualified scientists in total business employment
- Share of business expenditure on R&D as a proportion of GDP
- Number of UK patents granted by European Patent Office and US Patent Office

In one case, the government has committed to a specific and quantified improvement in the period under review (2004-2014), which is an increase in gross expenditure on R&D from the current 2% to 2.5%, with a commitment to work with business to increase its research intensity by up to 25% in the 10-year period.

These general and specific commitments have been devolved to the regional agencies, and as a result all economic development agencies have developed innovation strategies and innovation programmes in pursuit of this commitment to increase innovation. Progress is reported on annually and is reviewed periodically by HM Treasury and in particular during the biennial comprehensive spending reviews (CSR)

In addition, to the close links between regional officers (e.g. heads of innovation) and DTI functionaries, most of the DAs and RDAs have established "Science and Industry Councils" to bring together science, technology and business representatives from across the region. This is a new development in line with the findings of the House of Lords "Science and the RDAs" inquiry (2003) which recommended the establishment of a regional Science Council in every region. The key role of the councils is to increase the economic benefits of the publicly funded science, engineering and technology base in the region. They aim to forge strong relationships that will lead to better planning and coordination of a world-class science, engineering and technology base through an emerging strategy for

- Improved knowledge transfer
- Increased engagement of business with the SET base
- Providing the right skills to support the SET base

The two difficulties mentioned in interviews relate to the Commission's rules rather than to any problems locally, and include concerns over the level of bureaucracy associated with the structural funds, which is considered to be in appropriate with the context of business support, and so the funds have tended to be channelled through larger, public sector initiatives where the necessary administrative burden is more readily dealt with and is proportionate. A second challenge concerned the tension between the ambitions of local policy makers and operational teams, within the business support and innovation realms, and the view from DG Market that this sort of financial assistance to individual businesses is ineligible under the current application of state aid rules.

3.2 Policy mix assessment

This section provides an overview and analysis of the national and regional 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 sub-divided in terms of the direct beneficiaries of funding (or legislative) action. To simplify, the report adopts three broad types of organisation 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.

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

Exhibit 6: 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			
Innovation friendly environment			
Knowledge transfer and technology diffusion to enterprises			
Innovation poles and clusters			
Support to creation and growth of innovative enterprises			
Boosting applied research and product development			
Legend			
Top policy priority			
Secondary priority			
Low priority			

Source: calculations of study team based on national/regional policy documents, TrendChart reports, OECD reports, etc.

The following bullet points present a summary of the main policy areas, and related ambitions and public commitments, as set out in the UK 10-year science and innovation framework, referred to above

- World class research at the UK's strongest centres of excellence
  - Maintain overall ranking as second to the USA on research excellence, and current lead against the rest of the OECD; close gap with leading two nations where current UK performance is third or lower; and maintain UK lead in productivity
  - Retain and build sufficient world-class centres of research excellence, departments as well as broadly based leading universities, to support growth in its share of internationally mobile R&D investment and highly skilled people
- Greater responsiveness of the publicly-funded research base to the needs of the economy and public services
  - Research Councils' programmes to be more strongly influenced by and delivered in partnership with end users of research
  - Continue to improve UK performance in knowledge transfer and commercialisation from universities and public labs towards world leading benchmarks
- Increased business investment in R&D, and increased business engagement in drawing on the UK science base for ideas and talent
  - Increase business investment in R&D as a share of GDP from 1¼ per cent towards goal of 1.7 per cent over the decade
  - Narrow the gap in business R&D intensity and business innovation performance between the UK and leading EU and US performance in each sector, reflecting the size distribution of companies in the UK
- A strong supply of scientists, engineers and technologists by achieving a step change in:
  - The quality of science teachers and lecturers in every school, college and university, ensuring national targets for teacher training are met
  - The results for students studying science at GCSE level
  - The numbers choosing SET subjects in post-16 education and in higher education
  - The proportion of better qualified students pursuing R&D careers
  - The proportion of minority ethic and women participants in higher education
- Sustainable and financially robust universities and public laboratories across the UK
  - Ensure sustainability in research funding accompanied by demonstration by universities and public laboratories of robust financial management to achieve sustainable levels of research activity and investment
- Confidence and increased awareness across UK society in scientific research and its innovative applications
  - Demonstrate improvement against a variety of measures, such as trends in public attitudes, public confidence, media coverage, and acknowledgement and responsiveness to public concerns by policy-makers and scientists

This agenda is not particularly novel in terms of its content, however the 10-year framework does amount to a material change over the policy position that held in the previous rounds of structural funds, and that is in respect to its (i) cross-departmental quality, and in particular, the backing of HM treasury and (ii) the specificity of the various objectives and an expectation that progress will be tracked on all these fronts and future priorities and funding will reflect success therein. The latter point has been taken to its logical conclusion in respect of targets for increases in BERD intensity, with the chosen target being arrived at in response to the Lisbon agenda (in the UK, the target is lower and to be achieved over a longer time period).

There are several other notable developments, which have occurred in the period and which don't leap out of this list of priorities

- Emphasis on the innovation agenda across the piece, including the science base. All universities and public sector research establishments being pressed hard on both commercialisation and wider social and economic engagement. There is a debate between the research councils and the Office of Science and Technology about the appropriateness of introducing wide-sweeping changes to the peer review system wherein grants might be awarded to the best and most *relevant* science
- The regionalisation of innovation policy and delivery. Regional agencies have become central to the delivery of the innovation agenda, which is a major transformation in the period. Policy frameworks, flagship schemes and big budgets are still being defined/owned centrally, however the regions are increasingly involved in both the definition of major new mechanisms and the co-funding of programmes and projects with national government (e.g. National Technology programme provides government support from DTI, the regions and the research councils, as necessary). Equally, a growing proportion of universal business support and innovation support is managed and delivered at the local level, with national bodies setting performance conditions and offering support with respect to good practice and standards
- Sustainability of the public-sector research base, and in particular the switch to a different financial strategy (full economic costing) to overcome historical problems with funding models that have created deficits and under-investment at an institutional level

The following bullet points review each of the seven key policy areas, offering a short analysis as regards current policy objectives along with examples of specific schemes and measures

- Improving governance of innovation and knowledge policies. There has been sustained effort across the government sector to improve both targeting of policies and interventions and the efficiency of the institutions and programmes. Foresight and strategic planning are endemic, albeit not as thorough or probing as many

would like, and most budget holders and delivery agents are working against public contracts, with specific and sometimes quantified commitments. In line with this, the volume of effort devoted to monitoring and evaluation is also growing, although the efforts to catalyse innovation remains a difficult area for measurement and causal analysis

- Innovation friendly environment. The environment or framework condition within which business operates has emerged as a focus in its own right and a priority for the UK government, which has performed well on this dimension for many years. It is an idea that bears of most areas of UK government policy, from its policies to maintain stable macroeconomic conditions at the heart of a business-friendly environment, along with efforts to reduce red tape, improve incentives for entrepreneurship (tax credit, fiscal policies on share ownership, changing rules on bankruptcy, etc). The two major areas of difficulty here relate to physical infrastructure and the mounting tax burden needed to finance a fast-growing public sector
- Knowledge transfer and technology diffusion to enterprises. Technology transfer, and knowledge transfer more generally, has been a policy priority for almost 20 years with the first national scheme, LINK, being launched in 1987 and having launched more than 70 programmes in the period. The focus has been mainly on links between industry and the public sector research base, and recent policy papers, such as the Lambert Review, have concluded once again that there is a systemic failing in the level of engagement between business and the knowledge base (the innovation paradox). Increasing engagement is a specific target for all UK regional agencies, even though the S&T statistics suggest that if this were ever a problem is has been largely overcome and indeed successive Community Innovation Surveys have found that the majority of innovators rate clients and suppliers as being far more important triggers to and sources of innovation as compared with universities. Schemes such as the Higher Education Innovation Fund have granted hundreds of millions in assistance to universities wishing to pursue knowledge transfer and commercialisation; there is rather less money available to business specifically to assist with the identification and capture of value from the public sector
- Innovation poles and clusters. This is another longstanding focus of UK innovation policy, with national and regional programmes offering a range of different kinds of support to mature and emerging clusters, whether that be the Innovation Growth Team mechanism used to help set forward looking agendas for both the public and private sector in areas from aerospace to chemicals or more closely targeted policies to support technology development and economic growth in areas such as biotechnology or nanotechnology. The DTI micro and nano-technologies network is one such initiative, as is the emerging technologies scheme being run by the South East Economic Development Agency. Other regions have sought to encourage innovation and dynamism around major cities and science parks (Oxford, Aston, Cambridge, etc) while others have focused on efforts to re-invigorate mature local industries, from tourism to agriculture
- Support to creation and growth of innovative enterprises. University spin-offs and high tech start ups are seen by policy makers to be massively important and far more likely to be focal points for the emergence of international comparative advantage in the future and even whole new economic sectors. As with

knowledge transfer, this is an area that has seen widespread support at national and regional levels. National schemes such as SMART (now the grant for R&D or the grant for investigating an innovative idea) have been around for many years and have provided assistance in product and technology development to hundreds of small businesses

- Boosting applied research and product development. Boosting business expenditure on R&D has been one element of the investment rationale for national collaborative research schemes for the past 30 years, however in acknowledgement of the long-run decline in BERD intensity in the UK (for reasons to do with economic structure and global M&A activity) during that period, this topic has risen up the policy agenda in the past five years, and triggered the launch of several new initiatives, the most important of which has been the introduction of R&D tax credits for additional research activity undertaken by business. The Lisbon agenda has further emphasised this policy area. In addition, the UK government has increased dramatically the funds available for the science base, and in particular in the applied sciences and engineering fields, reversing a long run trend in government investment in particular (defence and other major departmental research spenders). The increasing budget for the EU RTD Framework Programme has also prompted a number of changes nationally in the recent past with annual income from Framework now running close to 400 MEUR. Changes include a more coordinated approach, public and private, to consultative exercises around programme content and more active encouragement/assistance to prospective applicants (through networks of advisors, online information services and portals)

The policy mix appears to be reasonably rounded and a good fit with what we know to be key issues within the UK national innovation system. As noted earlier, there are some evident shortcomings although these might be considered to be acceptable costs of a wider and balanced portfolio of policies

- Growing tax burden arising from a major programme of public services investments and uncertain efficiencies as regards public-service reforms
- Certain restrictions and inefficiencies with respect to the movement of goods and people across border, outside Europe in particular, although there remain issues with the 'single market'
- Most financial assistance for innovation is directed to and through the public-sector research base for historical reasons and for reasons to do with state aid rules, which creates inefficiencies and disincentives
- Manufacturing continues to dominate, with established national champions and lobby groups continuing to hold sway in many policy debates, while several of the fastest-growing areas, such as high-tech services, enjoy little policy attention, as is the case for other important areas of economic activity, such as government itself and public services. That said, the Department of Health has been increasing its concern with the innovation agenda, both in terms of industry sponsorship and as a means by which to source better/cheaper healthcare

- DTI and OGC are pressing all departments to think harder about the potential for Government procurement to function as an instrument of innovation policy, to parallel the situation one finds in the US. The UK has operated its own Small Business Research Initiative (SBRI) for the past five years, but this is a voluntary scheme with targets for purchases set at 2.5% of total budget, which even for a research council falls comfortably within the levels achieved historically for the purchase of research and technical services

The picture is more complicated at the regional level than at the national, and less well documented, which means it is harder to make a fair assessment of the balance of the chosen policy mixes and the efficacy of the interventions. There is a great deal of effort being devoted to the upgrading of policies, competence and schemes within the agencies however, in response to a number of widely reported concerns

- The innovation agenda is something of a Cinderella area for regional agencies, and is only slowly moving up the overall policy priorities
- Regional delivery of national schemes has tended to suffer from being rather low grade and inconsistent in the shape and quality of service delivery
- Region-specific policies are rather new and commentators report people struggling with the scale of the issues at hand, and the tractability of real-world problems when one has limited funds and powers
- Innovation measures are proliferating however, many of which are sub-critical in scale and poorly thought out in practice reflecting the inexperience of the agencies concerned in terms of innovation theory, choice of instruments, programme planning or programme delivery

There are positive signs too, as the whole scheme is less than five years old in the UK and the individual agencies and the DTI are working hard to establish competence and standards across the piece.

3.3 Conclusions: the national innovation system and policy mix

The following table offers a number of preliminary thoughts on the opportunities at hand for innovation policy and mechanisms in the UK, along with some potential risks or constraints.

We have no good view at this time of the potential for European funds. Our work for OST suggests that the added value of international funds tends to be in the volume of funds available rather than the scheme objective or forms of support. That is, businesses and clients are attracted to international funds where there are no national funds available. Otherwise, there is a strong preference for national money and rules rather than EU money and rules, which are believed to be so bureaucratic that many organisations refuse to participate and many others that do participate only do so on one occasion as the costs tend to outweigh the benefits.

Exhibit 7: Key opportunities and constraints

Policy objectives	Opportunities for Community funding (national priorities)	Constraints or bottlenecks (factors limiting Community funding)
Innovation governance	• Targeting of areas a of the economy that are presently being overlooked (e.g. services) • Targeting cross-border cooperation	• Young organisations need to upgrade internal competence/capacity of the regional agencies in the areas of innovation policy and programmes
Innovation friendly environment	• Security concerns in US present and opportunity for the UK to steal a march with respect to international science relationships and recruitment	• Funds for innovation are being placed under pressure by growing corporate tax bill to pay for public services
Knowledge transfer	• Many businesses would wish to do more in terms of innovation and business development, but with other businesses and overseas	• State aid rules appear to restrict the provision of assistance to businesses in this area
Innovation clusters	• Geographical and industrial spillovers are real and well understood and something that regional economies can exploit	• Agencies appear to be too fearful of being innovative in their own policies, and most appear to be chasing the same pipe dreams • There is an unworldliness about many strategies; one needs strength to build on, plus time and luck
Innovative enterprises	• Large queues of businesses and entrepreneurs willing to embark on numerous commercial technology projects, if government is prepared to increase the availability of research funds to business	• Very costly strategy. It is a numbers game, may need a 1000 start ups to get one fast-growing business that actually sees its fifth birthday • The market is a great leveller; the few promising or good start-ups will often be bought quickly by national or international competitors and their technology absorbed and their added value transferred • Targeting public-sector researchers may be a risk in its own right, diverting them from their primary function and into activities they are less good at
Boosting applied research	• There is latent demand to do more in many research-active businesses and sectors, where the price/risks can be reduced through public-private partnerships	• Market sets the rate, with R&D activity and investment remarkably consistent within sectors across businesses and countries and as such it is not obvious that policy makers could persuade the offshore sector to double its research intensity • Deadweight is a real risk, with public money simply substituting for private money with little or no impact on the underlying investment rate • Schemes to leverage in funds can mean that current investment/budget holders lose out with agendas and priorities set by third parties in disregard to the budget holder's own remit

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

This section of the reports provides an analysis of the patterns of Structural Fund expenditures in the fields of innovation and knowledge-based economy during the current programming period (2000-2006 for EU-15 or 2004-2006 for the new Member States). It examines the patterns from both a strategic point of view (the policy mix pursued by the Structural Funds 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 Fund support to innovation and knowledge

4.1.1 Strategic approach to innovation & knowledge in Structural Fund programmes

The UK has no overarching strategy for the deployment of structural funds in the area of innovation, but rather relies on regional and local agents to formulate specific strategies, with regional bodies being supported to some extent, and supervised, by two central government departments: the DTI, which leads on industry and innovation policy nationally, and the ODPM, which leads on a range of policy topics of relevance to the regions, from planning to housing to social exclusion.

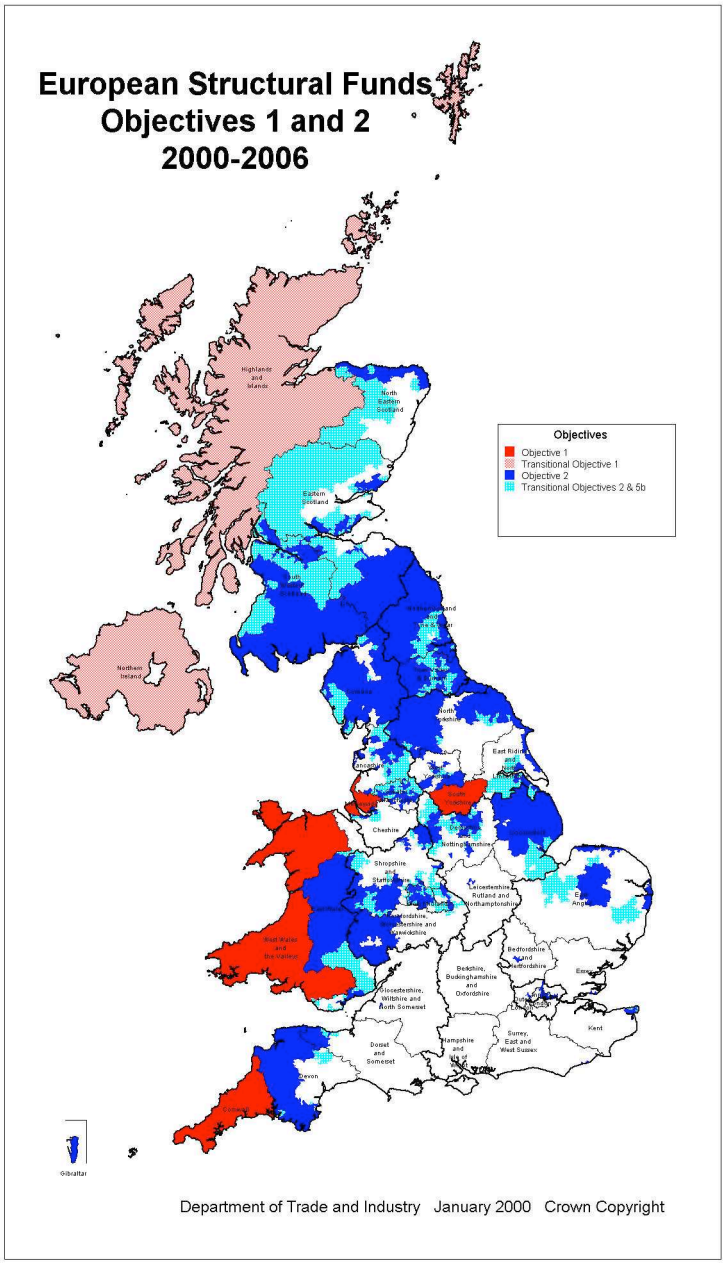
To arrive at an overview of the UK 'approach' to the management of innovation and knowledge development within the context of the structural funds, it is necessary to work at the level of the individual regions and programming documents.

In the UK, for the programming period 2000-2006, Structural Funds is financing six Objective 1 programmes and 14 Objective 2 programmes, with a total budgeted contribution of 11.3 bln EUR. This sum is required to be matched by national contributions, public and private and covers all funding streams and measures including research and innovation.

The map shows the Structural Funds intervention zones in the UK. The red and pink areas identify the Objective 1 and transitional objective 1 zones respectively. The blue and turquoise areas identify the Objective 2 and transitional zones respectively. The map shows that Structural Funds are concentrated in the northern part of England and Cornwall, as well as in Wales, Northern Ireland and Scotland. The distribution of Structural Funds is determined by the economic and social differences among the UK regions discussed in the earlier chapter on regional disparities, although it is interesting to note that Northern Ireland and the North East perform less well on a basket of innovation indicators than do Wales and Scotland, while they are considered to be marginally healthier regions in economic and social terms.

Three of the Objective 1 programmes are located in England: Cornwall and Isle of Scilly, South Yorkshire, and Merseyside in the West of England. Wales, Northern Ireland, and Scotland count one Objective 1 programme each: West Wales and

Valleys in Wales, Highlands and Islands in Scotland, and Northern Ireland. Northern Ireland and Highlands and Islands are Objective 1 transitional programmes. Objective 2 programmes exist in all UK regions, albeit with different funding levels.



All Objective 1 and 2 programmes follow a similar format covering five themes, summarised as follows

- Transport infrastructure
- Community economic regeneration
- Skills and learning
- Strategic development opportunities
- Competitiveness of small and medium sized enterprises

Innovation and knowledge economy measures are found for the most part in the latter two categories, 'strategic development opportunities' and 'competitiveness of small and medium sized enterprises.' The following paragraphs consider the measures in a little more detail for each of the main blocks in turn, which is England, Wales, Scotland, and Northern Ireland.

England

The Structural Funds interventions in England are organised into three Objective 1 programmes and ten Objective 2 programmes including one programme in Gibraltar.

The three Objective 1 programmes all attach importance to innovation and in particular supporting the growth of small and medium enterprises. This is especially the case in Merseyside, where the programme has invested almost 25% of its funds in support for the creation and growth of small firms, reflecting the importance attached to entrepreneurs and a dynamic small firm sector as a route to improved competitiveness and regional prosperity.

The other two Objective 1 regions have followed a more diversified strategy than has Merseyside. South Yorkshire and Cornwall have run initiatives to support SME growth alongside more targeted initiatives to develop and enhance local capacity in science and technology. In South Yorkshire, Priority 1 aims to support the development of several fledgling high-tech sectors such as ICT, energy, biosciences, and advanced manufacturing. In Cornwall, Priority 5 stresses the importance of regional specialisms within its support for R&D and the development of intellectual capital and knowledge more generally.

This bimodal approach characterises Structural Funds in the Objective 2 areas, where the innovation measures tend to take one of two main directions: on one side, supporting growth in the number and output of the region's SMEs through a wide-range of general, business-support measures from loans to mentoring to training and financial engineering; on the other side, programmes target their support on research and new product development through for example assistance with technology transfer and network building, business to business and business to knowledge base. In several cases, this support for R&D is targeted on particular emerging technologies and high-tech clusters.

The North East of England, North West of England, Yorkshire and Humber programmes fund these two forms of support (growth in general, research in particular) in roughly equally proportion. The West Midlands, South East of England, and London programmes have sought to take advantage of the stronger science base in their regions and have emphasised support for R&D over support for growth in general. These regions have also emphasised technology transfer, particularly in the area of information and communication technologies, as the wider and more rapid diffusion of these proven technologies is believed to be an obvious means by which to achieve substantial improvements in productivity and service quality in the small business sector. Indeed, information and communication technology is a horizontal theme for all the English programmes.

Wales

The combination of business support to SMEs and promotion of technological innovation is implemented by the West Wales and Valleys Objective 1 programme, the most funded intervention in all the UK. It invests almost 40% in priorities and measures related to innovation. The major effort is on financial and technological support for SMEs and entrepreneurs. Emphasis is also put on technology transfer initiatives, promotion of information technologies, development of high-tech skills, support for research and development, and finally the promotion of research in clean energy. The West Wales and Valleys programme and the London programme are the only two UK programmes that allocate funds to research in renewable energy.

The East Wales Objective 2 programme is one of the less funded interventions in all the UK. Almost 45% of the funds are dedicated to innovation initiatives. Half of that is used for financial support for SMEs. The remaining part is used to develop the region's innovation infrastructure such as high-tech business parks and technology centres for SMEs, and other forms of technology transfer with the focus on SMEs.

Scotland

Scotland is divided into four intervention areas: the Highlands and Islands Objective 1 transitional programme, the West of Scotland Objective 2, the South of Scotland Objective 2, and the East of Scotland Objective 2.

The Highlands and Islands Objective 1 transitional programme identifies 'increasing business competitiveness' as its core theme as regards innovation and knowledge development: SMEs are the target with growth being stimulated through financial assistance and other forms of support for R&D activities. There is a secondary focus on activities related to the innovation performance of the entire area such as research and development in information technologies and renewable energy.

This approach is also followed by the East of Scotland and South of Scotland Objective 2 programmes. On the other hand, the West of Scotland Objective 2 programme, which is the most funded programme in Scotland, aims to have a more open strategy with SME growth *and* innovative capacity being viewed as equally important and mutually necessary for the region's development.

Northern Ireland

The Community Support Framework (CSF) contains the strategy for the Structural Funds intervention in Northern Ireland. The plan consists of two operation programmes: the Northern Ireland Programme for Building Sustainable Prosperity and the PEACE II programme, which involves Northern Ireland and the Border Region of Ireland. Both programmes include actions in the area of innovation and knowledge. The strategy is similar to the other interventions in the UK with the principal attention on economic growth and competitiveness through financial and technological support for SMEs.

Exhibits 10 and 11 present an analysis of the budgetary allocation to structural funds, and the allocation to RTDI funds within that, which can give a deeper understanding of the different strategies of interventions in the area of innovation and knowledge. The calculations presented in the two exhibits are based on the allocation of Structural Fund budgets based on the intervention code classification. For practical purposes,

the calculation of financial resources allocated to innovation and knowledge development activities has been limited to the RTDI codes

- 181 Research projects based in universities and research institutes
- 182 Innovation and technology transfer
- 183 RTDI Infrastructure
- 184 Training for researchers

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

Exhibit 8: Overall allocation of resources at an objective 1 and 2 level (planned figures in Euro)

Objective	Total cost	Structural Funds			National Funds	
		Total	ERDF	ESF	Public	Private
RTDI INTERVENTIONS						
Objective 1	885,276,395.52	426,352,764.00	403,365,684.00	22,987,080.00	288,471,028.50	170,452,603.02
Objective 2	346,618,405.90	238,982,608.00	238,982,608.00	0.00	258,227,311.40	107,635,797.90
TOTAL COHESION POLICY						
Objective 1	14,208,591,126.00	6,291,319,539.00	3,954,935,140.00	1,881,215,716.00	5,184,439,662.00	2,732,831,925.00
Objective 2	12,986,658,719.00	5,014,856,600.00	4,484,032,790.00	530,823,810.00	5,913,993,121.00	2,057,808,998.00

Source: programming documents and financial data provided by DG REGIO

Exhibit 9: Regional allocation of resources (Euro)

Programmes	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
OBJECTIVE 1						
Cornwall and The Isles of Scilly	28.8	24.6	4.2	497,844,000.00	300,906,000.00	100,968,000.00
Highlands and Islands	7.7	7.7	0	319,854,639.00	190,101,740.00	62,349,716.00
Merseyside	95.4	95.4	0	1,389,070,300.00	930,640,300.00	452,400,000.00
South Yorkshire	57.8	57.8	0	1,221,488,700.00	833,146,700.00	365,292,000.00
West Wales and The Valleys	171.2	152.4	18.8	1,933,946,500.00	1,163,011,000.00	615,220,000.00
Northern Ireland Transitional Support	65.4	65.4	0	929,115,400.00	537,129,400.00	284,986,000.00

OBJECTIVE 2						
East Midlands	19	19	0	376,530,000.00	343,017,000.00	33,513,000.00
East of England	0	0	0	164,730,900.00	150,155,340.00	14,575,560.00
Eastern Scotland	25	25	0	261,546,500.00	261,546,500.00	0.00
London	15	15	0	273,900,400.00	242,594,400.00	31,306,000.00
North East of England	37.7	37.7	0.00	717,000,000.00	581,330,000.00	135,670,000.00
North West England	50.2	50.2	0.00	841,436,400.00	841,436,400.00	0.00
South East England	2	2	0.00	35,700,000.00	35,700,000.00	0.00
South of Scotland	6.8	6.8	0.00	76,313,200.00	76,313,200.00	0.00
South West of England	19.9	19.9	0.00	199,859,000.00	164,849,000.00	35,010,000.00
West Midlands	27.7	27.7	0.00	889,519,600.00	745,121,600.00	144,398,000.00
Western Scotland	0.00	0.00	0.00	504,465,700.00	437,594,450.00	66,871,250.00
Yorkshire and the Humber	27.4	27.4	0.00	538,670,200.00	469,190,200.00	69,480,000.00
East Wales	7.8	7.8	0.00	126,441,100.00	126,441,100.00	0.00
Gibraltar	0.08	0.08	0.00	8,743,600.00	8,743,600.00	0.00
Total Regional OPs	**665.3**	**642.3**	**23**	**11,306**	**8,438**	**2,412**

Source: programming documents and financial data provided by DG REGIO

The total financial allocation for RTDI, concerning codes 181, 182, and 183, is around 665 MEUR, or 5.8% of the 11.3 bln EUR Structural Funds intervention allocated to the UK for the period 2000-2006. This amounts to a RTDI allocation of around 150 EUR for every registered enterprise in the UK and around 11 EUR per person.

Two thirds of the RTDI allocation is to be committed through the six Objective 1 programmes, while the remaining third or 240 MEUR is to be committed through the 14 Objective 2 programmes. The budgetary split between Objective 1 and 2 programmes is even more pronounced in relative terms, with the Objective 1 allocation of 426 MEUR accounting for almost 7% of all objective 1 interventions.

Exhibit 9 breaks down the RTDI budgets by structural fund region and programme and reveals a broad spectrum for both objective 1 and objective 2 programmes. RTDI budgets for the objective 1 programmes range from a high of around 170 MEUR in West Wales to a low of around 8 MEUR in the Highlands and Islands, although the difference is less pronounced when the budgets are adjusted for the size of the overall Structural Funds budget: 9% and 2.4% respectively.

For objective 2 programmes, the RTDI allocations are much smaller in absolute terms and range from around 50 MEUR (4.8%) in the North West to zero in the West of Scotland and the East of England programmes. The spread is rather less pronounced in proportionate terms, adjusting the RTDI budget for the size of the structural funds allocation overall, at least it is if we ignore the two (of 14) programmes that allocate a zero budget to RTDI. The East of Scotland and South West of England both invest around 10% of their total allocation in RTDI actions, which is comparable with the share of funds deployed in two of the three Objective 1 programmes.

This distribution of funds changes if the definition of innovation support is softened to include interventions focussed on the growth and competitiveness of SMEs more generally (Refer to Appendix D for financial data about 152, 153,155, 162, 163, 164, 322, 324 interventions). On this basis, the total financial allocation for innovation and knowledge actions is estimated at 3.7 bln EUR, or around one third of all the Structural Funds interventions. The interventions for the objective 1 programmes are estimated at 24.5% and the objective 2 at 43%, which is the reverse of the situation for RTDI actions more narrowly. This is somewhat counter-intuitive, inasmuch as the Objective 2 regions will tend to have a stronger science base and industrial base than the Objective 1 regions and as such are perhaps better placed to derive benefit from the more narrowly targeted initiatives. However, the split makes more sense when one considers that the Objective 2 regions fare rather better than the Objective 1 regions in national R&D competitions and institutional funding for higher education. These data confirm the bimodal strategies described in the previous paragraphs.

4.1.2 Specific measures in favour of innovation and knowledge

The previous sub-section describes the pattern of support for innovation and knowledge overall, and in particular the typically bimodal strategy, generic and targeted support for innovation and knowledge, and a commitment of 4-8% of total funds. This sub-section reviews the individual innovation and knowledge measures defined in the SPDs of the 20 UK Objective 1 and Objective 2 programmes, in an effort to reveal any deeper patterns.

We have classified the 120+ measures to the six types of innovation policy measure described in Appendix C, and the results are shown in Exhibit 10. A number of measures were classified to more than one category and as such the table does not present a summary of either the number of schemes or the total funding.

In terms of numbers of measures, almost 50% of the 120+ fall in to one or both of the two policy areas: “Support the creation and growth of innovative enterprises” and “Innovation friendly environment”. The “Knowledge transfer and technology diffusion to enterprises” group counts for almost 30% of all the measures implemented in all the UK. This group can be divided into three main streams: schemes to support the utilisation and implementation of technologies, schemes to improve the adoption and the utilization of information and communications technologies, and, finally, schemes to develop technology, science and business centres. The majority of these measures promote networking amongst SMEs, universities, research institutes, and other public and semi-public bodies. This strategy is more emphasised in the “Innovation poles and clusters” group of measures. It counts for almost 10% of all the measures. These measures try to promote the

creation of networks among SMEs and strong industry/science links in order to allow SMEs to exploit activities of research and development. Finally, the "Boosting applied research and product development" group counts for less than 10%. It promotes research and development in the university with direct impact on new product development. Telecommunications, information technologies, environmental sciences, and renewable energy are the most mentioned scientific and technological areas in the research measures.

Exhibit 10 illustrates the number of measures in each policy area and an approximate share of total funding for each of the policy areas. 63% of the total funding is invested in the "Support to creation and growth of innovative enterprises" policy. This data reflects the common goals of the Single Programming Documents all over the UK, which aim to support the growth and competitiveness of SMEs. The importance of the policy area in the objective 2 areas is stronger. In fact, they invest 73% of all the Structural Funds allocation in supporting new firms' formation and consolidation of SMEs. On the other hand, objective 1 regions allocate 48% of funds in this policy area. They aim to help SMEs in filling technological gaps investing 24% of the funds in the "Knowledge transfer and technology diffusion to enterprise" policy, and 7% of the funds in the "Boosting applied research and product development" policy. This different distribution of funds reflects the necessity of objective 1 regions to reinforce the knowledge production system and the knowledge diffusion system of the area.

Exhibit 10: Key innovation & knowledge measures

Policy area	Number of identified measures	Approximate share of total funding for innovation and knowledge	Types of measures funded
Innovation governance	0		Technical assistance in the design of the regional innovation strategy
Innovation environment	25	13%	Aid schemes funding enterprises; secured and unsecured loans; infrastructures and services for e-government and ICT diffusion; financial engineering; education and training aimed at developing industry oriented and post-graduate courses
Knowledge transfer	39	17%	Aid schemes for utilising ICT related services and implementing technology transfer projects; ICT infrastructures; Competence centres.
Innovation clusters	16	4%	Measures aiming at increasing attractiveness of certain poles
Innovative enterprises	54	63%	Aid schemes for start up and grants related to improving internationalisation and marketing; Common services and infrastructures (e.g. incubators). Particular emphasis on SMEs
Boosting R&D	14	3%	Secured and unsecured loans for SMEs in order to carry out both mission oriented and bottom up research projects.

Nb: this table is a summary of the table in appendix D. The total of the percentage share per policy area may sum to more than 100 since certain measures fall into several categories.

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

4.2.1 Management and coordination of innovation & knowledge measures

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

In the UK, the management and coordination of Structural Funds interventions is somewhat complex involving two central government departments, 12 regional government bodies and a large number of local public-private partnerships, which take the lead in delivery.

The DTI leads discussions and negotiations with the Commission as regards national needs within the context of structural funds and specifically the amount of funding and associated conditions.

Referring to the managing authorities, each nation has a distinct system. In England, the regional Government Offices (GOs) manage the programmes under the co-ordination of the Office of the Deputy Prime Minister. The principal partners of the GOs are the Regional Development Agencies (RDAs).

In Scotland, the Scottish Executive is the managing authority, responsible for the implementation of all EU programmes in Scotland. The day-to-day implementation of the programmes is managed by the Programme Management Executives (PMEs), which are regional bodies. The PMEs are supported by Advisory Groups and Programming Monitoring Committees, which are composed of experts and stakeholders.

In Northern Ireland, the European Division of the Department of the Finance and Personnel is in charge of the Building Prosperity Programme and the PEACE II Programme, the cross-border programme involving Irish Border Regions.

In Wales, the Welsh European Funding Office (WEFO) is the managing authority for Structural Funds interventions. The WEFO is part of the Welsh Assembly. The Programme Management Divisions of WEFO are in charge of the day-to-day implementation of the programmes.

Lastly, in Gibraltar, the managing authority is the Business and Commerce Division of the Government of Gibraltar.

Structural Funds managing authorities work closely with cross-sector partnerships responsible for a specific area. The partnerships are composed of representatives from public, private, community, and voluntary sectors, which enable a broad overview of challenges and opportunities in a particular region or in a particular sector. Recent research by the DTI on Structural Funds interventions in the UK found

that the partnership-based approach offers a more integrated and systematic understanding of the priorities of the region. This, in turn, provides a powerful tool for actions and strategies.

The mid-term evaluations confirm this opinion concluding that the partnership approach brings positive effects such as the development of a more inclusive approach in regions strategies, ability to target problems and allocate resources, and introducing new ad-hoc organisations for specific purpose. The mid-term evaluations also stress that partnerships are a unique opportunity to put together regional and sub-regional partners. However, this aspect has also its downside in that the many and diverse interests brought together within the partnerships can create difficulties in the implementation of strategies and in funding.

Exhibit 11: absorption capacity of innovation & knowledge measures (MEUR)

CODES	ALLOCATED	DISBURSED	EXPENDITURE CAPACITY
OBJECTIVE 1			
181 – Research projects based in universities and research institutes	113.5	53.2	46.9%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	206.3	113.5	55.0%
183 - RTDI infrastructure	106.6	65.1	61.1%
TOTAL OBJ. 1	**426.3**	**231.7**	**54.3%**
OBJECTIVE 2			
18 - Research, technological development and innovation (RTDI)	27.7	15.7	56.6%
181 – Research projects based in universities and research institutes	13.9	7.2	51.4%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	143	85	59.4%
183 - RTDI infrastructure	54.3	30.5	56.3%
TOTAL OBJ. 2	**238.9**	**138.4**	**58%**

Source: Data provided by ISMERI

Exhibit 13 presents a breakdown of RTDI actions by broad category, for Objective 1 and Objective 2 programmes and shows the level of allocated funds that have been drawn down in practice, complemented by matched funds. This phenomenon is often referred to as a region's absorptive capacity, and reveals absorption rates of 46-61%, with marginally higher rates for the Objective 2 programmes, perhaps reflecting the lower levels of funding allocated and the arguably easier task of finding matching funds for smaller initiatives. The lowest absorption rate relates to science-base projects in the Objective 1 regions, arguably reflecting the relatively weaker capacity and standing of university and research institutes in the regions in question. The highest absorption rates relate to RTDI *infrastructure* in the Objective 1 regions, arguably a corollary of the current state of play in the regions concerned and local commitment to build both capacity and capability at an institutional level.

The distribution of R&D capacity is geographically uneven. In the private sector, one sees differences that largely mirror industrial structure locally, with R&D being more relevant and more in evidence in some industries than in others. In the public sector,

there is a strong spatial dimension too reflecting long-run, historical investment and success, which leads to the *uneven* agglomeration of scientific competence, due in part to knowledge spillovers, and not easily replicable when working from a low base and with a finite period of time and budget.

Overall, the analysis reveals a substantial, untapped financial potential for both groups of regions and in all categories of RTDI support, suggesting that greater national assistance would be able to leverage far more investment into the regions concerned. Of course, most of the UK mid-term evaluations make at least some reference to supply-side constraints too, arguing that demand for 'business support' in particular is less than it might otherwise be because of the complexity of the assistance on offer and the bureaucratic conditions applied to the funds. Several evaluations recommend rationalisation of business support (merging measures, softening eligibility criteria) and a simplification of the terms and conditions in order to increase scheme flexibility and visibility while at the same time reducing the costs of participation. Other evaluators suggest that the structural funds has already reached saturation point in the area of business support as shown by the fact that almost all UK programmes are struggling with absorption rates and performance targets (e.g. numbers of businesses assisted) and that the allocations should be reduced in the future and current funds should be vired across to other areas such as community priorities, where funds are in great demand and the associated public institutions are able to support rather more activity.

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

This sub-section of the report analyses the effects and added value of the Structural Fund interventions in favour of innovation and knowledge. The analysis is based on two main sources, namely: available evaluation reports or studies concerning Structural Fund interventions; and 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[4] of Structural Fund interventions but rather is based on the examination of a limited number of cases of good practice. These good practice cases concern the influence of the Structural Funds on innovation and knowledge economy policies (introduction of new approaches, influence on policy development, etc.), integration of Structural Funds 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.

The analysis of the various documents (Single Programme Document and Programme Complement) reveals two main streams of Structural Funds intervention in favour of innovation and knowledge among the UK regions. The first stream includes support for economic growth expressed through measures that boost new firm formation, sustain existing SME growth and promote entrepreneurial spirit. These objectives are

[4] 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)

mainly pursued through aid schemes, loans, modes of access finance, and workforce skills development. The second stream concerns interventions in promotion of research, new product development and new technologies adoption through knowledge transfer, networks, clusters, and enhanced industry science links.

Regarding the first stream, many of the mid-term evaluations conclude that the use of Structural Funds has increased the number of jobs in the region and the number of firms. In addition, partnerships, as a novel way of addressing local problems, have been a catalyst for the diffusion of an entrepreneurial climate. This finding is emphasised in the South of Yorkshire and Cornwall and the Isle of Scilly programmes. The evaluators of these two programmes believe that Structural Funds intervention has created a "good feeling" among SMEs in the regions and an attitude of "thinking big". However, several evaluations report that some objective 1 areas are not experiencing this effect to anything like the same extent. The Highlands and Islands programme is struggling in the face of its structurally weak economy. The mid-term evaluation reveals that the employment rate remains very low, as does GDP, with little evidence of progress against the UK regional average performance. By contrast, the South Yorkshire evaluation found that the employment rate was increasing, although new-firms formation remains much lower than the UK average. This trend is also present in some objective 2 areas such as East of Wales and East Midlands. However, on the objective 2 side, the mid-term evaluations reveal positive effects on job creation and new-firm formation in the East of England, London, and South West of England.

Regarding the second stream, the West Wales and the Valleys programme seems to be a good example of use of Structural Funds in favour of research and new product development. Tecnium Wales is an example of good practice in promoting knowledge transfer between SMEs, start-ups and universities. In the area of knowledge and technology transfer, RTD Centres of Excellence Programme should be mentioned as a good practice. This programme has been co-funded under the PEACE II programme and its aim has been to enhance the capability of Northern Ireland industry and universities in new technologies. The Centre for Functional Genomics in the University of Ulster and the Institute for Electronics, Communications and Information Technologies at the Queen's University Belfast are two successful examples of advanced research facilities in cutting-edge technologies. PEACE II Operational Programme and Building Prosperity Operational Programme have had a good impact on Northern Ireland also in the area of information technologies in terms of diffusion, use, and adoption of those technologies particularly among local enterprises. In this technological area, the Merseyside objective 1 programme has put several efforts and investments. The International Centre for Digital Media was funded in 2000 and it is part of Liverpool John Moores Business University. The mission of the Centre is to create a strong digital content industry in Merseyside. Since 2000, the incubator has fostered around 20 businesses in sectors such as graphic design, distance learning, animation, computer games and security systems.

The various examples illustrated in the paragraph reflect the opinions of different stakeholders from different UK regions. As stressed in the analysis of regional innovation in the UK, the innovation capacity varies all over UK. However, stakeholders seem to share a common belief about what can boost innovation in their

regions and how structural funds can help in doing that. Small medium enterprises and universities are the two principle actors of the regional system of innovation and the connection between them is crucial if the region wants to be competitive and innovative. In some areas, the degree of networking between academia and firms was very low. For example, this is the case of South Yorkshire where SMEs have shown difficulties in engaging with universities and vice versa. SMEs have perceived this linkage as unproductive in the short term. Universities have failed to relate to SMEs. However, the Structural Funds intervention 2000-2006 has started to bridge this gap through several programmes for knowledge transfer and networking. This missing link between academia and firms is also present in an Objective 2 region with a strong R&D tradition such as the East of England. A part from the case of Cambridge University, the links between local enterprises and universities are difficult. And again, the effort of the Objective 2 East of England operational programme has been successful in setting up incubation centres in universities in various technological fields. To sum up, all over UK there is a lack of 'social engineering', using a term suggested by a stakeholder, between universities, firms and other bodies. However, the various programmes have worked in order to develop the social engineering skills of the region. Stakeholders believe that much more effort has needed in this area and knowledge and technology transfer should be one of the main areas of intervention in the next term.

Stakeholders also indicate business supports and entrepreneurship as two successful areas of the Structural Funds intervention in 2000-2006. The case of the SPD 2 Objective in London is a good example in these areas. During the 2000-2006 period, almost 8000 start-ups have been established in Greater London using Structural Funds. Good results have been also achieved in Objective 1 areas such Northern Ireland, where, in 2004, the number of SMEs has increased by almost 35%. Regarding the promotion of entrepreneurial culture, different programmes have put in place several initiatives such as financial support, monitoring initiatives, and training course in entrepreneurship. One interesting case comes from East of England. The programme has supported the development of different courses on entrepreneurship at the University of Essex with the aim to enhance entrepreneurial spirit in the students but also in the academia promoting commercialisation of research and spin-offs creation.

The UK operational programmes show several successful measures and projects. The following two text boxes illustrate two initiatives. The first scheme is called Technium Network, delivered under the Objective 1 West Wales and The Valley operational programme, and it is part of the "knowledge transfer and technology diffusion to enterprises" policy area. The second initiative, called Up&Running Programme is part of the "support to creation and growth of innovative enterprises" policy area. Objective 2 London delivered this scheme. These two initiatives have been chosen because of their success and because they represent the two most important policy areas covered by the Structural Funds intervention in the UK.

West Wales and The Valleys: Technium Centres

The Welsh Development Agency describes Technium as a network of state-of-the-art facilities supported by the latest information technology coupled with business and technical support staff. 10 Techniums exist at present but eventually the 150 MGBP network is to comprise 13 sites across the region to encourage cluster development in pre-defined "key sectors" such as optoelectronics, digital media, IT, sustainable technologies, automotive technologies and the biosciences. The sites provide access to specialist laboratory facilities and communal networking areas and group together fledgling start-ups, entrepreneurs, researchers, developers, and industrial market leaders. Finally, a team of specialist business and marketing support advisors are available to support growth and development of knowledge based businesses at Technium Centres. The network began with the opening of the flagship Technium Centre in Swansea in 2001. Others have followed it, but the process is ongoing, with further locations under construction or planned for the future. There are currently more than 50 companies resident in Technium Centres across Wales, but it is hoped that more than 200 will eventually benefit when the network is complete.

The original centre, Technium Swansea, consists of two buildings, which houses businesses across a range of sector, including ICT, software, telecommunications, pharmaceuticals, multi-media, electronics and engineering. 19 companies are currently resident at this Technium, employing 227 people in total. The two units are 85% and 75% occupied currently. Technium Digital at Swansea University supports young technology businesses and is now fully occupied with 9 resident companies employing around 30 people. Its satellite centre, Technium Digital@Sony, based at the Sony Technology Centre can accommodate a further 8 companies. 2 companies are located in the recently completed Technium Sustainable Technologies, which can support 33 businesses employing around 150 employees within its 3,397 sq.m. 25 companies with 160 jobs have to-date been resident at Technium OpTIC North Wales, which is specialized in optoelectronics and connected with the University of Wales. Technium CAST, specialized in communication and software technologies, includes 6,500 sq.m. of laboratories and 16 businesses with almost 250 employees. Other Techniums around Wales are: Technium Aberystwyth, Technium Performing Engineering, and Technium Permbrokershire.

London: The Up&Running Programme

The Up&Running Programme is aimed at implementing a strong, client focussed pan-London framework of services to support the development of sustainable new business growth. The policy area is "Support to creation and growth of innovative enterprises". Interest in targeted support of new and small businesses has grown in the UK since the early 1990s. This is in response to a perceived link between new business start up and growth. As a result a number of initiatives and funding streams have been made available to facilitate new business formation. The UP&Running programme in London is one of the responses to this policy challenge, subsequently tailored to meet particular needs of entrepreneurs in the London region. London has a very strong entrepreneurial culture and track record with an estimated 34000 new businesses being started annually. The development of new enterprises is an essential element in securing London's long term economic growth: the small business sector provides employment, encourages competition and, in many sectors, is a valuable contributor to new products and service innovation. Yet only 60% of new enterprises in London survive their first three years of operation. Consequently, the programme aims also to reduce the vulnerability of new enterprises. The programme is started in 2000 and it will finish at the end of 2006. The mid-term evaluation at the end of 2003 reveals the following results: 2777 jobs created, 5084 people trained, 1297 new business start-ups, 2431 new business supported, 1165 new start-ups survived for 52 weeks, and 677 for 78 weeks. Considering that these data are related to a period in which the programme was just half way through the 52% of its life, these results were very promising. For example, in terms of jobs creation, the programme achieved the 36% of the entire target; in terms of people trained the 99%, in terms of business created the 27%, and in terms of business supported the 60%.

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

Overall, the mid-term evaluations suggest that the application of structural funds to research and innovation measures is generating worthwhile additional activity in the shape of for example large numbers of small firms participating in business development activities and the creation of new infrastructure and networks (e.g. business incubators located on campuses of leading regional higher education institutions). There do appear to be very real limits to the absorption of funds, reflecting both the challenge of supporting research and innovation where little has happened historically as well as the sensitivity of client businesses to the balance of risk and reward (from any form of government assistance). Questions arise naturally as to the extent to which the ambition to expand the use of structural funds as a vehicle for developing research and innovation competence is a realistic and appropriate 'blanket' policy; it is likely that take up and medium-term benefits are going to be strongest in those regions where there is already fledgling capacity and capability. Equally, the type of RTDI measures at the disposal of programmes may need to be reflected upon perhaps with the Structural Funds permitting a greater range of types of support in order to better match local needs. For example, support for strategy formulation or innovation action planning by existing local, industrial clusters may be rather more attractive to large numbers of existing businesses, or support for local businesses to link to and work with intermediaries (e.g. technology centres) and leading businesses (e.g. suppliers already active in international supply chains) based outside the region. The great strength of a local approach to RTDI, relevance of the intervention and local engagement, is to some extent being offset by a limited menu of schemes and proliferation of sub-critical initiatives and projects. Exhibit 15 summaries the main outcomes of innovation and knowledge measures. The capability has been measured as percentage of targets achieved.

Exhibit 14: main outcomes of innovation and knowledge measures

Programme or measure	Capability	Added Value
England		
SPD Ob 1 Merseyside - Priority 1 - Sub Priority Developing SMEs	Low absorption capacity	Increasing SMEs support and creation of new firms
SPD Ob 1 South Yorkshire - Priority 1 and 2	High absorption capacity	Creation of a more friendly business environment
SPD Ob 1 Cornwall and The Scilly	High absorption capacity	Increasing SMEs support and creation of new firms
SPD Ob 2 West Midlands - Priority 1	High absorption capacity	Adoption of e-business services by SMEs
SPD Ob 2 North West of England - Priority 1	Very high absorption capacity	Diffusion and adoption of innovative ICT solutions for SMEs. Creation of new firms in service sectors
SPD Ob 2 North East of England - Priority 1 and Priority 2	Low absorption capacity	Improving the understanding of regional needs
SPD Ob 2 Yorkshire and the Humber - Priority 1 and 2 plus measure 5.1	High absorption capacity	The development of partnerships has improved the capacity of collaboration among regional stakeholders
SPD Ob 2 East Midlands - Priority 1 and Priority 2	High absorption capacity	Increasing SMEs support. Reinforcement of the entrepreneurial climate
SPD Ob 2 London - Priority 2	Very high absorption capacity	Support for business growth and innovation activities. Particular attention has been put on micro-enterprises
SPD Ob 2 South West of England - Priority 2	Low absorption capacity	The practice of partnership enhances the understanding of SMEs' needs
SPD Ob 2 East of England - Priority 1 and Priority 2	Low absorption capacity	Strong effect in helping to unlock financial resources from other sources. Significant contribution to Regional Economic Strategy in areas such as creation of new firms and promotion of creativity and innovation within SMEs
SPD Ob 2 South East of England - Priority 1	High absorption capacity	Support for new product development
Wales		
SPD Ob 1 West Wales and The Valleys - Priority 1 and Priority 2	High absorption capacity	Reinforcement of modes of technology transfer such as thematic and sectoral centres located in universities
SPD Ob 1 East of Wales - Priority 1	High absorption capacity	Promotion of innovation in SMEs and micro-enterprises
Scotland		
SPD Ob 1 Highlands and Islands - Priority 1	Low absorption capacity	Improving the understanding of local enterprises
SPD Ob 2 East of Scotland - Priority 1 and Priority 2	High absorption capacity	Improving forms of support for start-ups such as helping cooperation with third level education to commercialise new products
SPD Ob 2 West of Scotland - Priority 1 and measure 2.2	High absorption capacity	Improvement of performance in service and high-tech sector such as biotechnology and electronics. New infrastructures for research base such as technology institutes
SPD Ob 2 South of Scotland - Priority 1 and Priority 2	High absorption capacity	Reinforcing the presence and the effectiveness of science and business centres
Gibraltar		
SPD Ob 2 Gibraltar - Sub-measure 1.2	High absorption capacity	Significance level of SMEs assisted
Northern Ireland		
CSF Northern Ireland - Programme for Building Prosperity (Priority 1) and PEACE II (Priority 1)	High absorption capacity	Support to SMEs growth

Effectiveness → significant results achieved; good absorption and management performance, etc. Added value of measures → reinforcement of national priorities, innovative approaches and solutions, institution building, etc.

5 Regional potential for innovation: a prospective analysis

This section of the report seeks to summarise and draw conclusions from the analysis of the proceeding sections, available studies and interviews and focus groups 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 orientations in terms of future Structural Fund investments in innovation and knowledge.

5.1 Factors influencing regional innovation potential

Stakeholders' opinions on regional innovation potential allow us to analyze the complexity of the UK situation differentiating between Objective 1 and Objective 2 areas. In the case of Objective 1 areas, three are the main factors, which can influence the innovation capacity of these regions. The first factor is related to the economic history of these areas. They have mainly a strong manufacturing tradition. This implies an existing know-how, which can be exploited to renew traditional sectors using new technologies. This is, for example, the case of companies in oil and gas technology field. They can use their know-how to invest in renewable energies. However, the manufacturing tradition also shows an over dependence on grants and a lack of innovation and entrepreneurial culture. The answer to these problems can be the promotion of clusters in cutting-edge technologies, green industry, and tourism industry and modes of supporting start-ups and entrepreneurship. The second factor is the low level of business R&D, and particularly R&D in SMEs, in these regions. The answer to that is the intensification of networking between universities and SMEs. The way of doing that is developing incubation centres, promoting clusters and improving the communication between universities and SMEs. The third factor is related to the universities. Objective 1 areas have good universities, but still too focussed on teaching and academic research. The local innovative function of the universities as a determinant of regional innovation is weak. The answer to that is encouraging universities in commercialising research and development, promoting spin-offs culture, and participating in firms-academia linkages.

The Objective 2 areas in the UK present a quite high innovation potential. These regions have generally a very strong research and development base. The R&D base is less strong in North of England where there are few R&D headquarters and there are not government research centres. The Objective 2 areas have also a quite good critical mass of SMEs and most of them perform R&D activities in collaboration with universities. However, this networking capability is limited to important centres such as Cambridge, London, Edinburgh, and Oxford. Outside these prestigious centres the missing link between universities and SMEs is a critical point. This aspect is particular relevant for manufacturing industries, which, based on stakeholders' opinions, lack of drivers towards changes. To sum up, Objective 2 areas present a good R&D base, a good and quite dynamic SMEs base, and prestigious universities quite connected with the local economy. The challenge is to reinforce these factors. Mechanisms of technology and knowledge transfer, entrepreneurship and venture capital, and clusters in key sectors such as energy, biosciences, and creative industries should be the initiatives to take in order to boost regional potential.

The exhibit below presents a summary of the main factors influencing future innovation potential in each group of UK regions, based on our consideration of the key regional statistics/indicators on economic and innovation performance.

Exhibit 15: factors influencing innovation potential by type of region

Type of region	Main factors influencing future innovation potential
Learning regions	• Several of the UK regions within this group perform poorly on R&D indicators, reflecting industrial mix • The regions are relatively weak on high-tech manufacturing • Many have good public-sector research sectors • Several have reported strong performance on economic indicators in terms of growth in GDP per capita • Several have reported strong performance on innovation indicators, from the increasing proportion of knowledge based enterprises to the increasing number of patent applications and registrations • Start-ups formation rates vary among these regions.
Central Techno	• The North East is a small region at the margins of the EU, which records average to poor performance on most economic and innovation indicators reflecting long-run decline in its predominantly traditional heavy industry • There has been improvement in several key sectors, including automotive and high-value services • Growing disparity between central zones of major cities and other parts of major conurbations • Industrial restructuring is continuing
Low-tech government	• Northern Ireland (NI) is a peripheral region to both the UK and the EU • It continues to struggle with high levels of social dislocation and exclusion • NI records average to poor performance on most 'economic' and 'knowledge economy' indicators reflecting both problems with industry structure (long-run decline in its predominantly traditional heavy industry such as shipbuilding) and social conflict • High-levels of government employment, created as part of earlier regional policy regimes, have done little to improve working opportunities
Science and service sector	• London records performance far ahead of UK average and EU average on economic indicators • London registers low levels of high-tech manufacturing and low levels of BERD, as compared to the EU and UK average • Strength in high-value services and knowledge businesses is growing • High start-ups rate

5.2 A prospective SWOT appraisal of regional innovation potential

The previous section illustrated the main features of the UK regions. This section will further discuss regional innovation potential through a SWOT analysis of the four clusters in which UK regions have been classified.

The majority of the 12 UK regions fall into **learning regions** category, which is to say the regions are characterised by a high score on the factor 'Learning Families' while being close to the EU regional average on the other three factors. Other notable features include: unemployment is low compared with the EU regional average, employment in the government sector is limited, GDP per capita is rather high, and BERD is slightly above the EU average. However, There are strong differences on many of the lower-level indicators however, across this sub-group of eight UK regions, which relate to the inherent innovativeness of the regional economies. For instance, regarding business start-ups rate, the learning regions can be divided in three main groups. The first group includes regions with a low business start-up rate, in absolute terms, such as the North West (Merseyside) and East Midlands and where active policy measures have been taken to redress the situation, including large regional venture capital funds and support to local universities through the higher education innovation fund. The second group comprises regions with good business start-up rates and with universities that are progressively building an entrepreneurial attitude. This is the case of Scotland, Wales, South West of England, and West Midlands. The last group includes the stronger regions, in terms of innovation performance, such as the East of England and the South East of England. And here there is an expectation that their historical advantage, in terms of opportunity-led start-ups, and particularly start-ups in newer, faster growing sectors, will persist and even accelerate in the future as emerging technologies and economic clusters mature and achieve critical mass. These regions dominate the science base too, outside London, and account for a substantial proportion of the 200 or so university spinoffs registered annually. Indeed, Cambridge and Oxford universities are the two dominant British sources of spin-offs, with Imperial College in third place, and both institutions sitting at the heart of technology hotspots (science cities)[6].

These differences can also be observed into the distribution of SMEs and their capacity to engage with the regional knowledge production systems. For instance, in Wales and the South West, there are demand-side issues with a smaller population of indigenous SMEs in economic sectors with high growth potential, as compared with the regions in the South East and East. Merseyside and South of Yorkshire have a good mass of SMEs, particularly in manufacturing, and universities, which are starting to focus more on commercial issues.

[6] A recent article in The Chilli newsletter reports a US study on biotech start-ups and suggests that the connection between innovation, growth and productivity enhancement may be strongly linked to sectors. The review suggests the agglomeration of world-class universities and research labs in California has had a major impact on the state's success in dominating the US data on biotech start-ups and that moreover these new businesses have outperformed existing businesses and new entrants combined by a factor of 10, in terms of both employment and sales growth.

The North East is the smallest of England's nine administrative regions in terms of population and, with the exception of London, is the smallest geographically. It falls into the **central-techno** category. The region's economic performance has been one of relative decline during the later decades of the 20th Century, as indicated by the growing 'productivity gap' between the North East and the UK national average. This reflects a variety of complex factors including the capacity of the region to respond to the growth of globalisation and the decline of heavy industry (shipbuilding, steel, petrol-chemicals, etc). There has been some restructuring and a renaissance in medium-tech manufacturing following inward investment by Nissan. The region is one of the smaller of the 12 regions and has a correspondingly small SME community, however it does have several strong universities and centres of excellence and there is clearly an opportunity to contribute to the re-structuring and modernisation of the economy through the encouragement and nurturing of high-tech start-ups. The universities located in the region show a very positive attitude towards commercialisation of research through spin-offs formation.

Northern Ireland falls into the **low-tech government** category. The region sits at the bottom of the UK rankings when it comes to indicators of both the knowledge economy and innovation more generally, with very low scores on high-tech manufacturing, high-tech services and knowledge workers. The region performs poorly on the related innovation indicators of BERD, patent applications and S&T employment. The absolute number of SMEs and start-ups is low in comparison with the situation in the other UK regions. However, there are several small, but significant clusters of small companies in key economic sectors and technology fields such as nanotechnologies, aerospace, and pharmaceuticals.

London is the only UK region that falls into the **science and service sector** category. The region, which is geographically very small, registers scores on key economic indicators and knowledge economy indicators that place it well ahead of the UK average and in several cases well ahead of the second placed region. Greater London has a vibrant SME community, especially in the services sector, and a good complement of prestigious universities. Interaction between the business community and academe is good generally, however it is less evident in some of the Capital's most dynamic sectors, in media, fashion, consulting, finance and so on. Initiatives to promote stronger engagement with these business groups ought to help to secure continuing success for established sectors such as the creative industries and ICT, and also for new, emerging clusters around, for example, the green economy.

Exhibit 16: Innovation and Knowledge SWOT

Learning regions	Opportunities	Threats
Strengths	▪ Low employment in the government sector.	▪ High GDP per capita ▪ Low unemployment ▪ High share of university research in total research
Weaknesses	▪ Industrial mix in flux ▪ SME community can raise and improve.	▪ Low presence in high-tech manufacturing ▪ Low levels of economically active adults

Central Techno	Opportunities	Threats
Strengths	▪ North East improvements in automotive, defence and design and media services	▪ Small number of SMEs not very well connected with universities.
Weaknesses	• Presence of universities with an entrepreneurial spirit. They should be reinforced	▪ High salaries ▪ Low presence in high-tech manufacturing ▪ Industrial mix in flux

Low-tech government	Opportunities	Threats
Strengths	▪ Northern Ireland aerospace, nanotech and shipbuilding clusters.	▪ High levels of employment in low-grade government and public service jobs
Weaknesses	• Small SME community, but with some of them in cutting-edge sectors.	▪ Social dislocation ▪ Weak industrial base ▪ High levels of economic inactivity

Science and service sector	Opportunities	Threats
Strengths	▪ Financial, media and other high-tech services ▪ Good research base and universities ▪ Vibrant SME community.	▪ Tight labour markets
Weaknesses	• Green technologies can represent an opportunity of growth.	▪ High wages

We have written about the general strengths of the UK economy at various points within this report, which encompass factors such as its macro-economic policies, framework conditions, enterprise and its membership of a group of Anglophone countries, from Australia to the US. If there is a general weakness regarding innovation in the UK at present, it is arguably to do with its industrial mix – the low share of medium-tech manufacturing and the high share of low-tech services – and a growing tax take at a point in time when most economies are seeking to reduce the fiscal burden and reform cash-hungry public services.

There is another area of weakness that is of greater relevance to the present study, which is the rather unthinking approach to innovation policy evident in most regions, perhaps reflecting the youth and inexperience of regional agencies in the UK. Every one of the English regions and devolved administrations has a regional economic strategy; all of them have the task, defined nationally, of boosting regional productivity, business registrations and survival rates and inward investment. This regional dimension is a new departure within the UK policy environment and the present regional economic strategies all look rather similar in terms of their priorities and commitments to support business growth and competitiveness, focusing on key sectors, regional supply chains, international trade and business and innovation support to all.

The seriousness of those strategies is open to question. The budgets for dedicated, innovation strategies are not disclosed, but they are very small and range from 10 MGBP to 20 MGBP annually, and while the bulk of the UK industry ministry's 2 bln GBP a year spend on business support (operations and programmes), which includes a wide-range of innovation support schemes, is promoted and even delivered through regional agencies and offices, it is rather chaotic and only loosely connected to regional objectives. Moreover, structural funds have been used variously to support innovation schemes of one kind or another, and yet few regional agencies have a clear view as to how this valuable source of financial support should be integrated with other regional and national efforts.

There are indications of improvement in this policy milieu. The second-generation regional economic strategies are more sophisticated than their antecedents, with distinctive priorities and development goals and objectives that are more specific, with defined targets and indicators in some cases, and rooted in a more substantive analysis of local needs and potential. They are becoming more evidence based in the conception. Innovation strategies continue to be the Cinderella of the piece and the second-generation remain rather bland statements of intent with non-specific commitments to be active in the same five arenas as every other region in the UK, and the rest of Europe for the matter. They are for the most part not accompanied by a specific – disclosed budget – and are, to the last, without measurable objectives.

5.3 Conclusions: regional innovation potential

This sub-section will summarise the main findings regarding the innovation potential in the British regions. Five main policy headlines have been identified and they are discussed below.

Policy headline 1: Potential for boosting rates of SME innovation through enhanced knowledge transfer.

- While aggregate UK economic performance has been strong, there is evidence at a regional level of weaknesses in the small business community with respect to their innovativeness, caused by information asymmetry and capacity constraints. Our interviews with stakeholders, and our reading of various regional innovation strategies, reveal a widespread belief that these two classic constraints must be removed, or alleviated, through government action to connect SMEs into more and better networks with universities and other technology organisations as well as interaction and joint development across value chains, business to business. UK commentators believe that improving these external relationships has the potential to bring about a step change in the innovativeness of hundreds or even thousands of SMEs, which in turn should engender changes in attitudes and behaviour of the majority through competition and the market. The innovation potential of SMEs is an untapped opportunity for all UK regions, rather than any one region, and making more of this potential is a critical focus of both policy makers and intermediary organisations.

Policy headline 2: Enterprise and entrepreneurship look set to begin to grow more strongly than it has in the past decade, and with this being concentrated on the south and east regions and the major cities.

- Promoting enterprise remains a pillar of UK government policy and one of its five key productivity drivers. The UK government has put in place measures to correct both the demand side (such as measures to create a step change in enterprise culture) and the supply side (for example, fiscal and regulatory measures to lower costs of being entrepreneurial, infrastructure and advice and improved access to finance to help correct for the famous equity gap). One can also see major change in attitude and activity across the UK universities, with annual monitoring surveys recording both more and more extensive forms of interaction with business from teaching, to consultancy, to licences and start-ups. This emphasis on the innovation agenda is a cultural shift in the scientific landscape, with funding bodies all but re-writing their constitutions to add a remit to promote economic gain as well as advances in knowledge. A proportion of the 50% increase we have seen in the UK science budget during the past five years is finding its way through to third-stream activities, from incubators, to business coaching to venture capital. In addition to this, the DTI and the regions have launched a long-list of schemes to promote entrepreneurship on the one hand and fix several of the classic market failures on the other. All this combined with good framework conditions and stable macro-economic situation makes for a promising climate to promote an increase in the underlying rate of formation of innovative companies.

In light of the trends in lead indicators (long-run improvements in entrepreneurial attitudes, long-run growth in VC investments) and the increasing policy commitments and investment, one has to expect a change in the rate of business registrations in the near future and in particular in sub-categories of most interest to policy makers, high-growth and high-tech start-ups.

All UK regions see this issue as a crucial area of intervention to promote economic growth.

Policy headline 3: Potential for increasing regional competitiveness in cutting-edge technologies.

- The UK in general appears to be well placed to capture a significant share of global activity in a range of emerging technologies and nascent economic sectors, as a result of its positive macro-economic policies, existing strengths in key sectors from pharma to knowledge-intensive business services and its world-class research base. Other positive indications include the country's historically strong performance in respect to the attraction of foreign direct investments, a good proportion of which is linked to businesses that are more research intensive than the equivalent indigenous firms, and the country's position on the leader board with respect to VC investments and its dominance of biotech start-ups. There are weaknesses too, in for example, its low share of medium-tech manufacturing or the escalating tax burden associated with an expanding public sector or in its high share of low-tech services.

The bigger concern here, however, is that its innovation potential is skewed regionally, and also within regions, reflecting a range of factors from industrial mix, to market access (proximity, size, density, affluence, etc), to growth poles (global cities, entrepot, science cities, etc) to spillover effects from defence and other public investments (from government labs to synchrotrons).

- Regarding the **learning regions**, computer science and electronics are relevant technologies for the Yorkshire and the Humber, North West of England and South West of England, East of England, and South East of England. Automotive, aerospace and rail technologies are particularly relevant for East Midlands, West Midlands, and Wales. Nanotechnologies, optoelectronics, biotechnologies characterizes East of England, South East of England, and East of Scotland.
- North East of England (**Central-techno**). The region has focused attention on nanotechnologies and life sciences. Research centres should be further develop in the next intervention.
- Northern Ireland (**Low-tech government**). Nanotechnologies, aerospace, and pharmaceuticals are three promising technological fields for Northern Ireland. The establishment of small companies in these fields is a proof of that.
- London (**Science and service sector**). Information and communication technologies, biotechnologies, and nanotechnologies are areas of great success for London

Policy headline 4: Potential for enhancing the value of UK creative industry.

- The UK regards itself as one of the global forces in the area of creativity and its creative industries, from architecture to video production, do generate proportionately high levels of international interest and exports. The creative industries have come to be seen by national and regional policy makers as focal point for support and encouragement, and as a potential source of enhanced economic success, through innovation within the sector itself, boosting both its world market share and its price-performance. Relevant areas for the creative industry are:

  - **Learning regions** have tried to promote creative industry in past SF intervention. For instance, North West of England region, in particular Liverpool and Manchester, is working to promote the digital media sector. This is the case of the Media Enterprise Zone in Greater Manchester. Other examples are Wales, Scotland, and East of England.
  - North East of England (**Central-techno region**). The development of a centre of excellence in digital media can represent an opportunity to develop creative industry in the region.
  - Greater London (**Science and service sector**). London is among the most famous international location for creative industry.

Policy headline 5: Potential for developing a strong green industry.

- The green economy is another area where the UK regional agencies have been active in promoting and supporting both emerging technologies and nascent clusters of new businesses, as it is an area of economic activity that is expected to grow in the future, and be predominantly local in terms of delivery/operations at least. It is also a national political imperative following on from our various international commitments to reduce greenhouse gases and promote sustainability in all its forms.

One can see instances of new suppliers in a wide range of activities, from alternative forms of energy production to eco-tourism. Equally, there is growth in several more established areas such as environmental consulting and technology development or the organic food industry.

Many of the alternative energy forms are likely to be harvested in the more remote areas and coastal strips, in the UK's less favoured regions, and with national government support through public-private partnerships, one might see a prolonged period of heavy investment in the regions.

- **Learning regions** such as North West of England, East Midlands, West Midlands, South West of England, and Wales have started to put great attention on green industry. For example, the Markham Environmental Centre in East Midlands is an example and the Renewable North West programme in North West of England is another.
- North East of England (**Central-techno**). The established centre of excellence in renewable energies can be the base for further development.
- Greater London (**Science and service sector**). The last SF intervention has addressed the green economy with a measure on renewable energies

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

This section will summarise the main priorities for the Structural Funds intervention in 2007-2013 in relation to innovation and knowledge. This section is the result of different policy recommendations from the update mid-term evaluations and the consultation phase with stakeholders from the different UK regions. The first part of the section will highlight the areas of intervention for the next term. The second part will discuss operational and administrative guidelines to maximise the effects of Structural Funds.

The overall aim of Structural Funds is to intervene in situations of market failure. This view is the main principle also used in the draft of the National Strategic Reference Framework for the Structural Funds programme 2007-2013.

> 'The Structural Funds should therefore only be used to finance these and other regional interventions in cases where free markets have genuinely failed to provide the goods or services by themselves, and where the reasons for this market failure have been carefully identified'[7]

The problem of market failure around innovation is particularly acute for smaller enterprises, which tend not to generate the surplus funds or maintain the additional resources necessary to permit them to do much more than attend to their day-to-day business and current customers. Smallness limits an enterprise's ability and incentives to look forward and outward and as such the majority will be content to follow rather than lead in respect to the opening up of new markets or the evolution of price-performance in the products and services they sell. These constraints may or may not harm individual SMEs in the medium term, but they almost certainly reduce the aggregate rate of innovation and economic growth, which might threaten an entire industrial grouping. The threat may more generally also for any region that is unduly dependent on an economic constituent that is under severe competitive pressure from other industrial businesses and clusters around the world, and which is not able to change its behavioural mode from innovation follower, or laggard, to leader. The amount of R&D undertaken by SMEs is still low and this represents a major risk for British enterprises. Thus, one of the strategic future orientations of the Structural Funds intervention should be convincing SMEs in doing more R&D. This implies a sort of training action towards SMEs in order to illustrate them the value and the necessity of R&D. It also implies creating the right condition for doing R&D. This point is linked to another common belief among the stakeholders. SMEs can effectively do R&D only if they increase their networking capabilities with the universities. Investing in networking, clusters, and knowledge and technology transfer is determinant. Thus, this intervention should be focussed on SMEs, but also on universities. They should be more involved in relationships with SMEs and they also focus more on the commercialisation of research. A more proactive role of universities is determinant for regional innovative capacity. Consequently, the promotion of entrepreneurship is important within the universities, to empower spin-

[7] DTI. 2006. Draft National Strategic Reference Framework. EU Structural Funds Programmes: 2007-2013.

offs creation, and within the business system, to promote start-ups. Entrepreneurship can be done through monitoring, training, but also with advanced financial engineering systems such as venture capital funds.

Regarding target sectors, the UK regions appears to be well placed to capture a significant share of global activity in a range of high-tech manufacturing sectors (automotive design, component manufacture, aerospace, transports, defence) in a range of emerging technologies (digital technologies, nanotechnologies, biotechnologies), and in the creative industries (digital media, cinema, fashion, etc). Green industry represents an emerging sector.

Regarding operational guidelines, there is widespread agreement as to the need to simplify processes and reduce bureaucracy. The need for accountability and control is not at issue, but rather the number and specificity of controls is believed to be disproportionate (as compared with the risk of improprieties) and that not only is this inefficient and wasteful, but it degrades effectiveness too through inflexibility on the one hand (inappropriate tools) and a major turn-off to the people and organisations schemes need to engage with in order to secure their wider social and economic goals. The contributors to the discussion also believe that Objective 1 regions and future Convergence regions should be freer to operate. These issues are directly related to delivery and administrative rules such as state aid and matching funds. For example, some stakeholders argue that it is very difficult to persuade companies to contribute to the interventions. In addition, State Aids rules allow including only companies with less than 250 employees. For some stakeholders, this is a problem because large firms represent the core of supply chains, which are made also of SMEs. Excluding large firms means excluding possible indirect help to SMEs. This problem is emphasised when a large company has acquired a local and successful SME. The SME continues to work locally, but it cannot be supported because officially part of a large enterprise. The same argument is applicable to university spin-offs. The lesson is to include large firms in the next intervention.

Returning to the question of matching funds, there are issues evident even on the public side. Building budgets demands multi-party funding in most cases and requires high levels of openness and interaction among the many different public bodies and intermediaries with an interest. In practice, there is often poor coordination among different regional offices and agencies involved in the implementation of Structural Funds. This is could be a consequence of lack of strong regional governance in the UK. This missing coordination among bodies is also the result of funds division between ERDF and ESF. For example, in order to implement management and entrepreneurship training programmes, the Managing Authority should co-operate with another agency in charge of the ESF. Sometimes this cooperation is slow and time consuming. Furthermore, more interaction between Structural Funds and Framework Programme is also important. It is recognized that partnerships are very useful in aligning regional and local strategies, enhancing the transparency of the delivery system, and they represent a good example of interaction between different actors. Lastly, stakeholders agree that an effective and successful intervention should be focused on big projects with strategic and thematic focuses. The main unit of intervention should be a specific theme and not a specific geographical area. In relation to indicators used for measuring the output of

initiatives, stakeholders suggest a more intensive use of qualitative evidence of innovation in the evaluation processes.

The next two sections will summarise the main recommendations raised by the discussion on future Structural Fund intervention.

6.1 Strategic orientations for Structural Fund investments in innovation and knowledge

Key conclusion 1: Poor awareness of the value of research and new product development is a barrier for the innovativeness and competitiveness of SMEs

The amount of R&D undertaken by SMEs is still low and this is a major risk for British enterprises. It is very difficult engaging with SMEs and convincing them that research and product development is a principal factor to be competitive. R&D is perceived as a barrier and not an opportunity, unless is ready-to-market research. In addition, the idea of knowledge as a company asset is not perceived as a value because it is an intangible goods.

Recommendation 1: Bridge the communication gap between universities and SMEs and investing strongly in different forms of knowledge and technology transfer.

Our interviews with stakeholders, and our reading of various regional innovation strategies, reveal a widespread belief that one of the strategic future orientations of the Structural Funds intervention should convince SMEs in doing more R&D and recognizing the asset value of knowledge. This implies a sort of training action towards SMEs in order to illustrate the value and the necessity of R&D. It also implies creating the condition for simplifying RTDI measures, expanding range of eligible RTDI actors and activities, reducing regulative requirements on participants, implementing government action to connect SMEs into more and better networks with universities and other technology organisations as well as interaction and joint development across value chains, business to business. Improving these external relationships has the potential to bring about a step change in the innovativeness of hundreds or even thousands of SMEs, which in turn should engender changes in attitudes and behaviour of the majority through changes in the basis of competition.

The innovation potential of SMEs is an untapped opportunity for all UK regions, rather than any one region, and a making more of this potential is a critical focus of both policy makers and intermediary organisations. There are differences across the UK regions, on both the supply side (knowledge production) and demand side (SMEs). As such, the potential looks somewhat different from one area to another.

- **Learning regions**. For the East of England the challenge is to replicate aspects of the success of the commercialisation model centred on Cambridge University, and to extend this to other regional universities and technology centres of excellence to expand the capacity and proximity of the supply side, to better meet growing demand.

In Wales, Scotland, and the South West, there are demand-side issues with a smaller population of indigenous SMEs in economic sectors with high growth potential, as compared with the regions in the South East and East. These regions

have made a determined effort with respect to building infrastructure for knowledge exchange and supporting the development of the absorptive capacity of local SMEs, and with some success. This is the case of Technium Wales and Combined Universities in Cornwall.

Merseyside and South of Yorkshire have a good mass of SMEs, particularly in manufacturing, and universities, which are starting to focus more on commercial issues.

- North East of England (**Central-techno**). The region has several strong universities and centres of excellence and there is clearly an opportunity to contribute to the re-structuring and modernisation of the economy through the encouragement and nurturing of innovation networks with companies.
- In Northern Ireland (**Low-tech government**) strengthening SMEs has been a policy focus and the number of SMEs is increasing (by 1/3 in 2004), particularly in key economic segments such as aerospace. Existing centres of excellence can be further developed to bring together SMEs, universities, and college of further education.
- In Greater London (**Science and service sector**) interaction between the business community and academe is good generally, however it is less evident in some of the Capital's most dynamic sectors, in media, fashion, consulting, finance and so on. Initiatives to promote stronger engagement with these business groups ought to help to secure continuing success for established sectors such as the creative industries and ICT, and also for new, emerging clusters around, for example, the green economy.

Key conclusion 2: The growth trend in entrepreneurial activity is strong and this may presage an increase in start-up formation and business development.

The UK has the third highest level of entrepreneurial activity in the G7, based on statistics for the proportion of the population starting a new business or running a young businesses, with the US and Canada first and second (10-12% adult population) and Japan in seventh place. However, there is little difference in the statistics for UK, France and Germany (at around 4-5% of the adult population). Attitudes about starting or running one's own business are improving. This growth trend in 'attitude' is stronger than the data on actual start-ups, a five-year trend that is only slightly positive, which may presage an increase in entrepreneurial activity.

Recommendation 2: Increase the level of entrepreneurship, start-up formation, and access to finance for SMEs

The challenge is to nourish an existing positive entrepreneurial attitude in different business sectors and universities through the implementation of entrepreneurship training and mentoring schemes, promoting incubation centres within universities, facilitate the access and the use of financial engineering tools, and consolidate the regional venture capital funds.

- **Learning regions**. North West (Merseyside) and East Midlands need to improve the active policy measures have been taken to redress the situation, including large regional venture capital funds and support to local universities through the higher education innovation fund. Learning regions with good business start-up rates and with universities that are progressively building an entrepreneurial attitude need to promote the commercialisation of research base and providing

venture capital support. This is the case of Scotland, Wales, South West of England, and West Midlands. Finally, there are the stronger regions, in terms of innovation performance, such as the East of England and the South East of England. And here there is an expectation that their historical advantage, in terms of opportunity-led start-ups, and particularly start-ups in newer, faster growing sectors, will persist and even accelerate in the future as emerging technologies and economic clusters mature and achieve critical mass.

- North East of England (**Central-techno**) has several strong universities and centres of excellence and there is clearly an opportunity to contribute to the re-structuring and modernisation of the economy through the encouragement and nurturing of high-tech start-ups. The universities located in the region show a very positive attitude towards commercialisation of research through spin-offs formation. All of this need to be nourished.
- Northern Ireland (**Low-tech government**) is the smallest UK region in terms of population and the absolute number of SMEs and start-ups is low in comparison with the situation in the other UK regions. However, there are several small, but significant clusters of small companies in key economic sectors and technology fields such as nanotechnologies, aerospace, and pharmaceuticals. The level of entrepreneurship needs to be stimulated through facilitation the economic exploitation of new opportunities (venture capital funds, entrepreneurship courses), and the promotion of an enterprise culture.
- Greater London (**Science and service sector**) registers the largest number of new businesses annually of any UK region, which his around 50% higher than the UK average. London also has a vibrant higher education sector and the spin-off culture is particularly well developed at Imperial College and University College of London. Additionally, London benefits from its ethnic diversity (entrepreneurship statistics suggest that many ethic groups are significantly more entrepreneurial than their white counterparts) and the business community is beginning to show the first signs of change in its composition/nature following the influx of economic migrants from the new member states. Lastly, there is a long tradition of entrepreneurship in the service sectors – media and creative industries, finance, insurance, tourism, etc and an enthusiasm for novel commercial and domestic services in areas linked to the green economy.

Key conclusion 3: UK regions appear to be well placed to exploit economic opportunities in different technologies and nascent sectors.

The analysis of the regional innovation potential has revealed that the UK innovation potential is highly skewed regionally. Each region has specific technological orientation. This technological potential can be broken down in three main categories cutting-edge technologies (biotechnologies, nanotechnologies, automotive, space, etc) creative industry, and green industry. Supporting the development and exploitation of these sectors may well prove to be a source of regional comparative advantage.

Recommendation 3: Using Structural Funds intervention for support around sector specific innovation.

Structural funds should be use to promote the execution of world-class use-oriented basic research, the supply of professional masters, the diffusion of technology/techniques, the evolution of complex products and services across value chains, the business-to-business innovation networks, the establishment of industrial-academia clusters, the development of high skilled graduates. These interventions

should focus on high-tech manufacturing, emerging technologies, creative industry, and green industry.

Regarding cutting-edge technologies, there are a number of notable industrial regional clusters where one might expect to see continued growth. These clusters include:

- Aerospace in the North West, South West and South East.
- Automotive design and component manufacture in the West Midlands.
- Creative industries in areas from media to software in London, Manchester, Edinburgh.
- Knowledge intensive business services in London and the South East.
- Pharmaceuticals in the East and South East.
- Defence in the South East.

Regional strengths in emerging technologies have been listed in the previous section.

Considering the creative industry, there is rapid expansion in customers for, and in the consumption of, recreational software (games), communications applications (3G) and digital content for both commercial and consumer markets. The other major sub-sectors are: advertising, architecture, design, fashion, film, publishing, etc). In the software+ field the big challenges are around the creation of new applications and services (e.g. e-marketing for e-retailers, recommendation engines for e-retailers), creation of faster, more efficient development tools, the faster, cheaper acquisition of digital content and the evolution of new business models.

The regions with a promising creative industry have been discussed in the previous section: North West of England, Scotland, Wales, East of England, and London.

Regarding the green industry, in the past 12 months there has been several key changes in policy – new senior appointments with an energy brief and background, new strategies and new investments – which are evident in a number of contentious debates around nuclear energy, energy taxes, infrastructure, etc. One can envisage a period of both heavy rhetoric and heavy investment in everything from materials science; to experimental development around hydrogen fuel cells to the construction of new infrastructure, using public-private partnerships, like the Severn barrage (wave power).

6.2 Operational guidelines to maximising effectiveness of Structural Fund interventions for innovation and knowledge

Key conclusion 4: Excessive regulations and intensive auditing slow down implementation and creative ways of using funds

Stakeholders recognizes the necessity to control how money are spending, but they argue that regulations, documentation, and auditing activities risk to slow down the implementation of Structural Funds and questioning creative ways of using them. This view confirmed the analysis of the operational programme evaluations. The issue was common among all the regions.

Recommendation 4: Clear and easy to apply rules, and flexibility in the management of programmes can enhance the quality of the intervention

Reducing bureaucracy and making rules flexible, where possible, can maximise the effectiveness of Structural Funds. It is also important to build the new delivery system on good practices from previous programmes and learning lessons from programme such as EQUAL and LEADER+. For instance, in the previous intervention, State Aids rules aim to include only companies with less than 250 employees. This could be a problem because large firms represent the engine of supply chains, which are made also of SMEs enterprises. Excluding large firms means excluding possible indirect help to SMEs. This problem is emphasised when a large company has acquired a local and successful SME. The SME continues to work locally, but it cannot be supported because officially part of a large enterprise. The same argument is applicable to universities spin-offs. The lesson is to include in the next intervention large firms.

Key conclusion 5: The previous intervention shows different missing links between different organizations involved in the management of Structural Funds.

The complex management system of Structural Funds has revealed some coordination problems between organizations. For instance, different actors are in charge of ERDF intervention and ESF intervention. This causes delays in the implementation of specific measures. Another example is the alignment of the Structural Funds interventions with the regional economic strategies or with business support strategies. Regional Development Agencies and Business Links manage these respectively. The coordination between those agencies and the Government Offices, which is the structural fund managing authority, can sometimes slow down the implementation.

Recommendation 5: Promoting partnership as a good practice of coordination.

The complex regional governance in the UK determines coordination problems illustrated previously. In the specific case of Structural Funds management, continuous changes in the administrative practices avoid continuity and learning from experience. However, the evaluations of structural funds intervention in the UK and stakeholders' opinions suggest that the partnership model is a good practice of coordination because it provides higher transparency of the delivery system, better alignment with regional and local strategies, better sharing of risks, and it represents a locus of discussion among all the actors involved in the regional innovation system.

Key conclusion 6: Investments in several small projects can disperse ineffectively the intervention.

Experiences from the previous intervention show that the implementation of small projects are time consuming and not effective for beneficiaries.

Recommendation 6: The next Structural Funds intervention should be strategically focussed on a small number of large projects.

Small number of large projects can be effective and really able to have an impact on regional innovation systems. The suggestion is to design large projects based on quality and innovation potential. In order to do that, it is also important to allow easy integration with other programmes such as Framework Programme.

Exhibit 17: Summary of recommendations on investment priorities

Region or group of regions	Strategic focus	Priority measures	Indicative financial resources
Learning Regions (North West of England, Yorkshire and The Humber, East Midlands, West Midlands, East of England, South East of England, South West of England, Wales, Scotland)	Knowledge transfer and technology diffusion to enterprises. Innovation friendly environment. Innovation poles and clusters. Boosting applied research and product development.	Supporting universities' propensity towards commercialisation of research and spin-offs culture. Linkages academia and small and medium enterprises. Developing a set of activities to promote start-ups creation: entrepreneurship courses, management training and monitoring, providing venture capital for innovative start-ups. Research and development in emerging technologies and green economy.	RTDI + business support expenditure as % of regional SF allocations (2000-2006): 27.68% RTDI + business support indicative expenditure 2007-2013: No less than 30% until 50%. Between 5% and 10% for Research and Development.
Central Techno (North East of England)	Innovation poles and clusters. Innovation friendly environment. Support to creation and growth of innovative enterprises.	Creation of centres of excellence in advanced technologies such as nanotechnology, renewable energy, digital media, life science, and advanced manufacturing. Business support based on demand. Providing venture capital for technology-based companies.	RTDI + business support expenditure as % of regional SF allocation (2000-2006): 69.54%. RTDI + business support indicative expenditure 2007-2013: up to 60% of all the regional allocation.

Region or group of regions	Strategic focus	Priority measures	Indicative financial resources
Low-tech Government (Northern Ireland)	Support to creation and growth of innovative enterprises. Knowledge transfer and technology diffusion to enterprises. Boosting applied research and product development.	Business support, particularly in relation to in-house R&D. Empowering connections between universities and SMEs through the development of centres of excellence within universities. Developing a set of activities to promote start-ups creation: entrepreneurship courses, management training and monitoring, providing venture capital for innovative start-ups.	RTDI + business support expenditure as % of regional SF allocation (2000-2006): 20.36%. RTDI + business support indicative expenditure 2007-2013: max 30% of all the regional allocation.
Science and Service Sector (Greater London)	Innovation poles and clusters. Knowledge transfer and technology diffusion to enterprises. Boosting applied research and product development	Developing clusters in strategic areas such as creative industry, bioscience, and renewable energy. Networking firms with universities in order to empower business R&D. Developing venture capital and loans funds and designing training and mentoring to promote entrepreneurial activities.	RTDI + business support expenditure as % of regional SF allocation (2000-2006): 30.3%. RTDI + business support indicative expenditure 2007-2013: max 30% of all the regional allocation

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 EU-27 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.

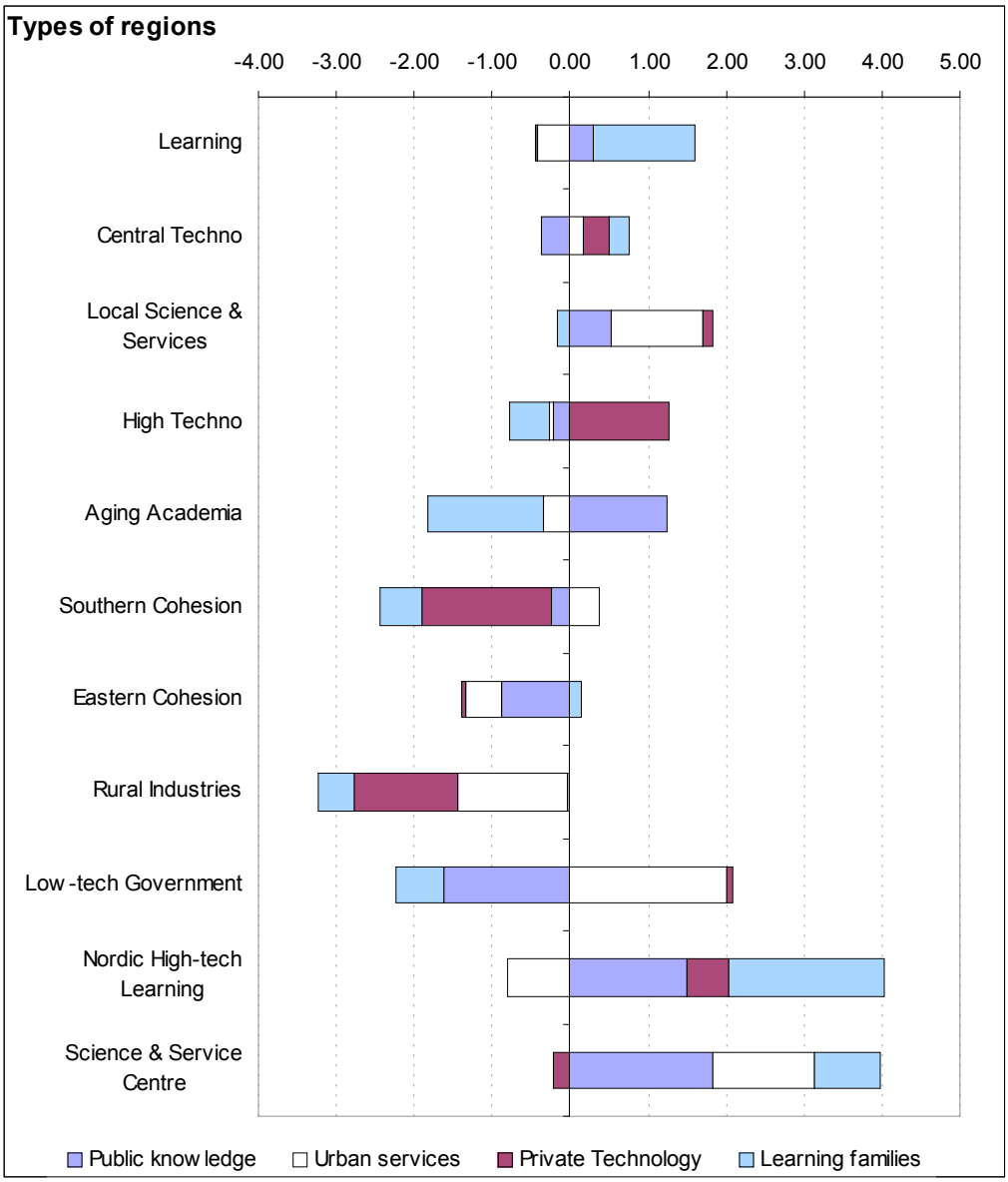
One interesting conclusion is that public and private knowledge are two different factors (F1 and F3 respectively), which for instance has implications for policy issues regarding Science-Industry linkages. Public R&D and higher education seems especially related to high-tech services, whereas Business 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 invest 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 is 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 area's 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 manufacturing 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.

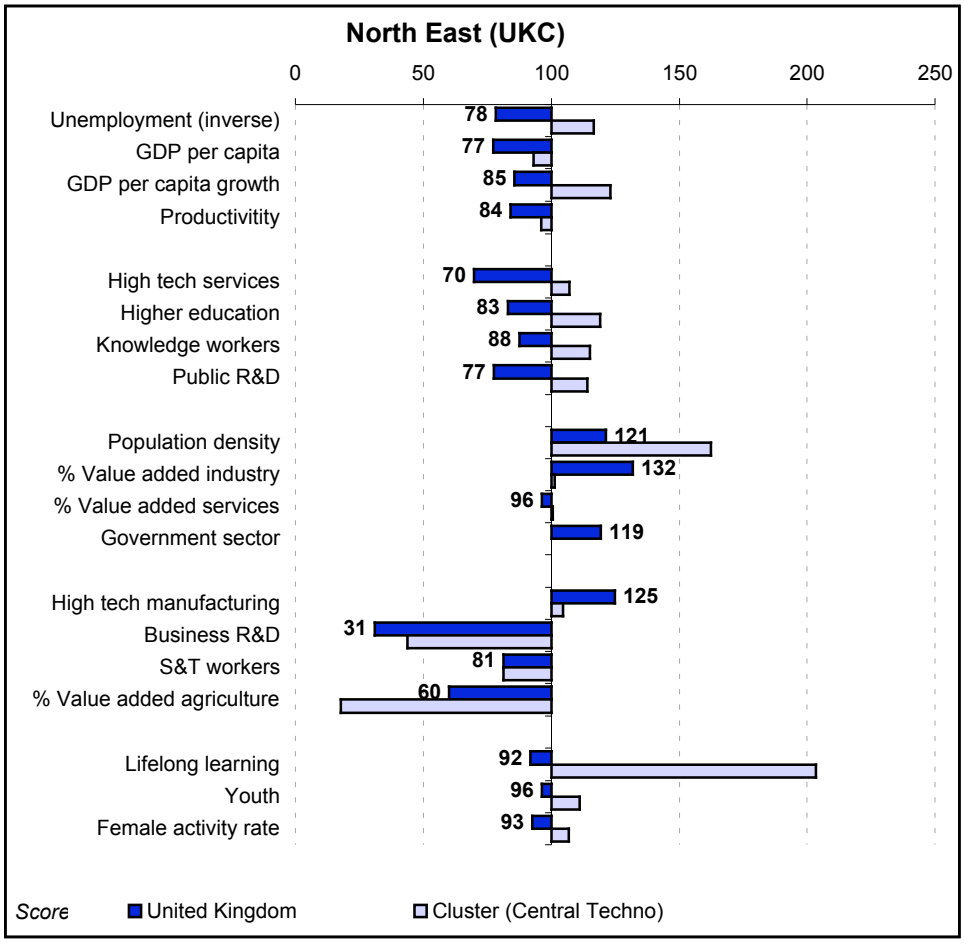
An overall synthesis report of all has been prepared and will be published by the European Commission providing an overview of the issues addressed in each of the 27 country reports produced by the evaluation team.

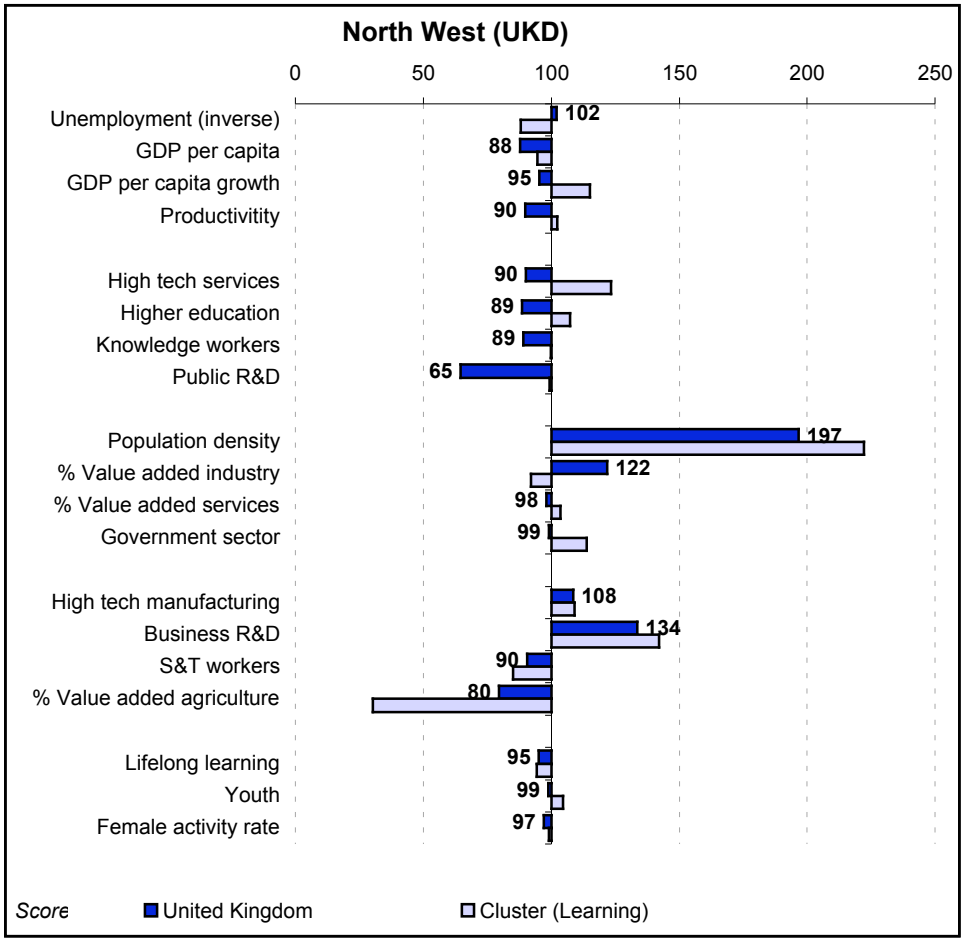
Appendix B Statistical tables and regional scorecards

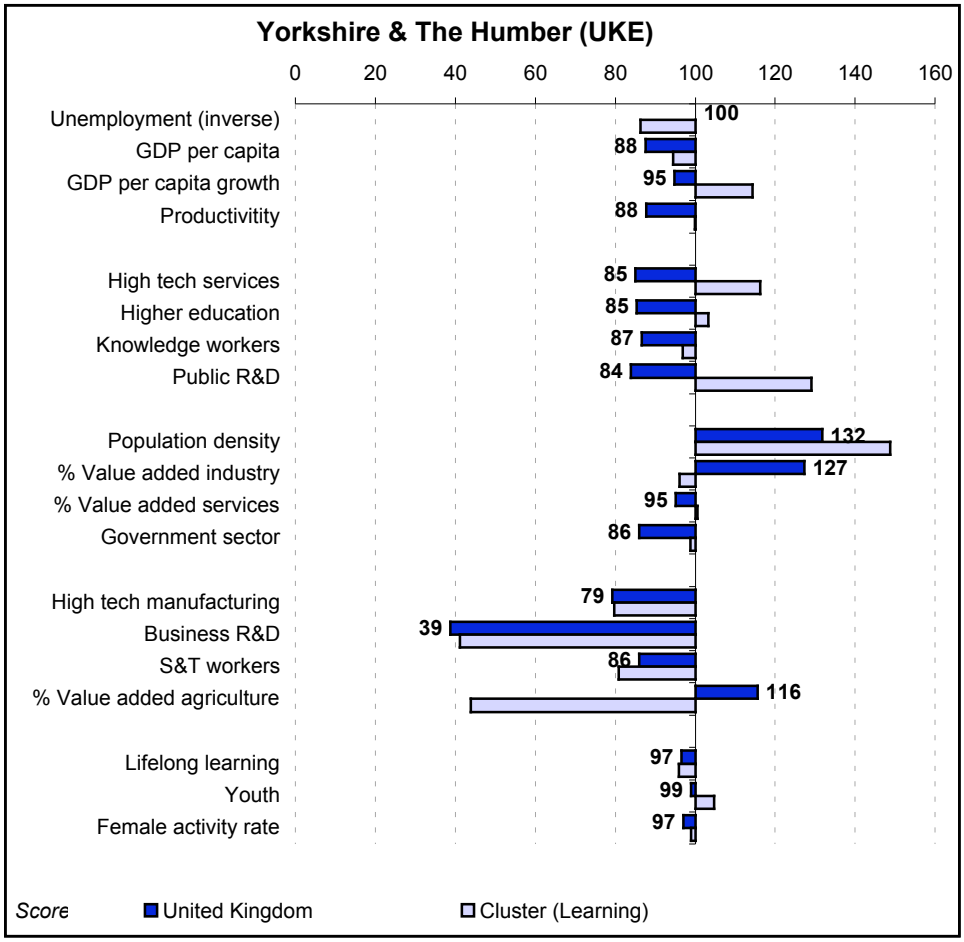
B.1 Overall quantitative analysis per region

			Economic performance			Public knowledge					Urban services				Private technology				Learning families			Cluster factor scores			
		Cluster	Unemployment	GDP per capita	GDP per capita growth	Productivity	High tech services	Higher education	Knowledge workers	Public R&D	Population density	added industry	added services	Government sector	High 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
			2003	2002	1996-2002	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				
United Kingdom	UK		5.0	24945	5.7	5577	4.4	26.8	14.0	0.62	243	23.0	69.7	6.9	6.3	1.19	20.7	0.9	14.9	12.9	54.9				
Relative to EU25			184	118	120	122	138	129	120	90	208	85	98	92	95	96	100	44	171	119	114				
North East	UKC	2	6.4	19249	4.9	4687	3.1	22.2	12.3	0.48	295	30.3	67.2	8.2	7.8	0.37	16.8	0.6	13.7	12.4	50.8	-0.26	0.17	0.18	1.02
North West	UKD	1	4.9	21878	5.5	5007	4.0	23.7	12.5	0.40	479	28.1	68.4	6.8	6.8	1.59	18.7	0.7	14.2	12.7	53.2	0.08	0.07	0.24	1.41
Yorkshire & The Humber	UKE	1	5.0	21832	5.4	4892	3.7	22.8	12.1	0.52	321	29.3	66.3	5.9	5.0	0.46	17.8	1.1	14.4	12.7	53.2	0.26	-0.17	-0.37	1.36
East Midlands	UKF	1	4.4	21892	4.8	4693	3.2	22.4	11.2	0.46	270	30.9	65.7	6.2	8.1	1.63	18.1	1.5	14.3	12.5	55.7	-0.02	-0.37	0.36	1.32
West Midlands	UKG	1	5.7	22133	5.1	4900	4.0	22.5	11.4	0.33	408	28.9	67.5	5.2	10.1	0.84	17.0	1.1	14.7	13.0	54.1	-0.07	-0.30	0.27	1.46
Eastern	UKH	1	3.9	23325	5.3	4834	5.0	25.7	13.4	0.77	284	24.7	71.1	6.7	6.3	3.07	21.3	1.4	15.0	12.7	57.2	0.60	0.20	0.57	1.52
London	UKI	11	7.0	40068	6.5	8824	5.8	32.9	17.2	0.62	4654	12.4	77.6	6.4	2.7	0.46	25.6	0.0	17.1	13.4	55.3	2.13	1.54	-1.13	1.75
South East	UKJ	1	3.8	27105	6.6	5506	6.1	30.9	16.0	0.70	421	20.3	75.6	6.4	6.8	2.12	24.6	0.7	15.9	12.5	58.4	1.27	0.42	0.29	1.58
South West	UKK	1	3.4	23052	5.6	4873	4.5	28.1	14.8	0.52	207	24.5	70.7	7.0	6.3	1.58	21.3	1.7	15.0	11.8	56.7	0.87	0.05	0.03	1.24
Wales	UKL	1	4.7	19103	4.7	4593	2.2	25.9	15.2	0.56	141	29.5	67.1	7.7	6.4	0.46	20.6	1.4	14.5	12.5	49.1	0.34	-0.05	-0.16	1.00
Scotland	UKM	1	5.8	23776	5.0	5204	3.8	30.3	15.2	0.97	65	26.2	68.5	8.0	5.2	0.75	20.2	1.6	14.6	12.2	55.6	1.03	0.14	-0.21	0.93
Northern Ireland	UKN	9	5.6	19608	5.6	4740	2.4	23.3	12.5	0.42	120	27.5	68.2	17.0	5.3	0.63	17.0	2.2	10.4	14.9	49.8	-1.79	1.88	0.49	1.71

B.2 Regional Scorecards




North West (UKD)
0
50
100
150
200
250
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
102
88
95
90
90
89
89
65
197
122
98
99
108
134
90
80
95
99
97
Score
United Kingdom
Cluster (Learning)


Yorkshire & The Humber (UKE)
0
20
40
60
80
100
120
140
160
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
100
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95
88
85
85
87
84
132
127
95
86
79
39
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116
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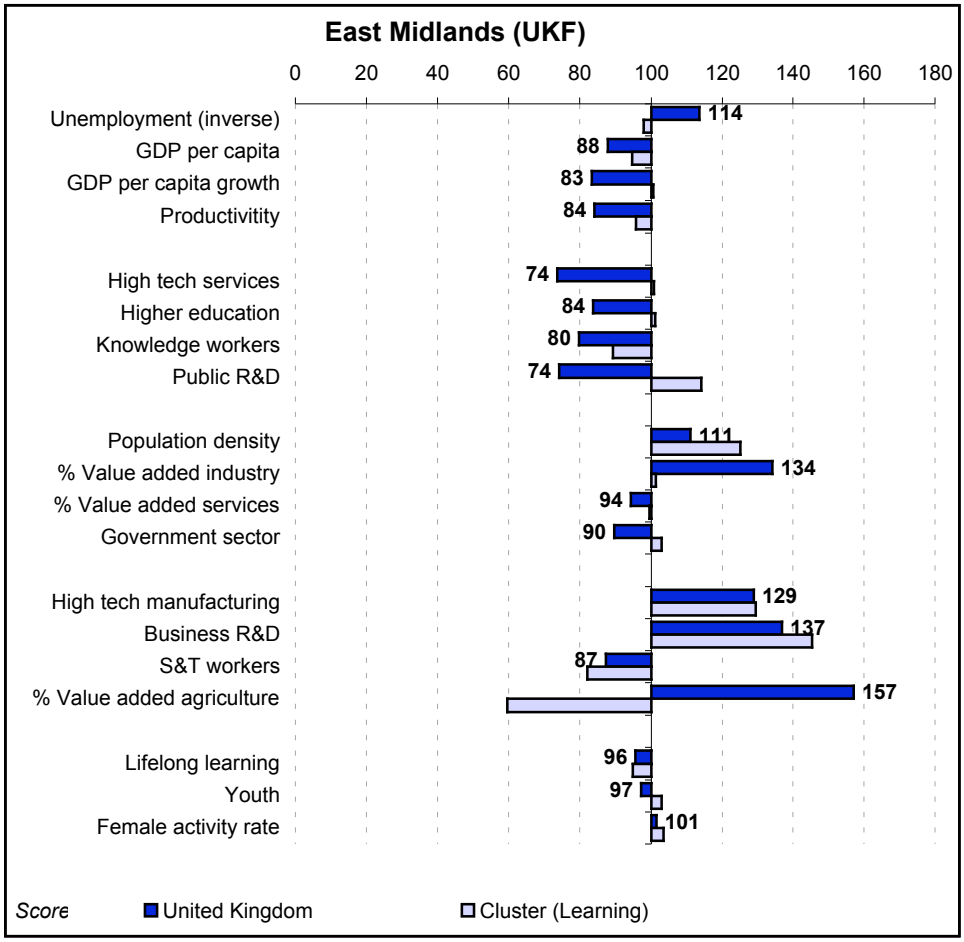
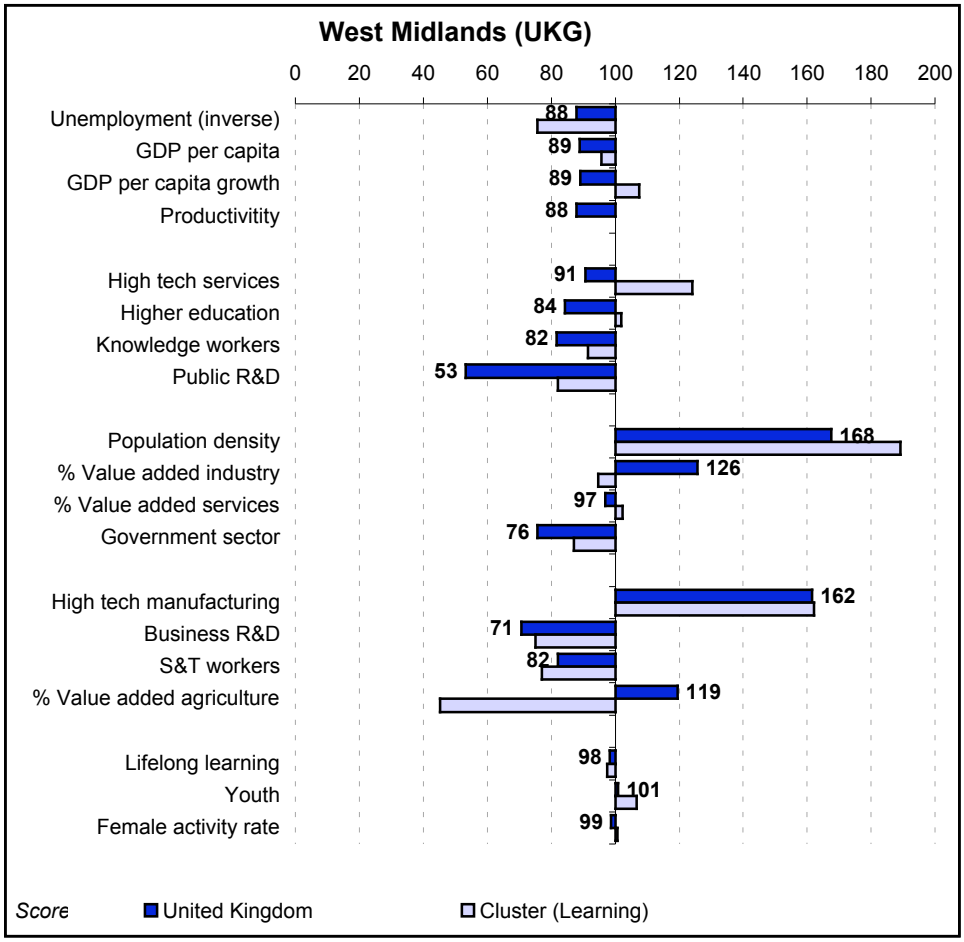
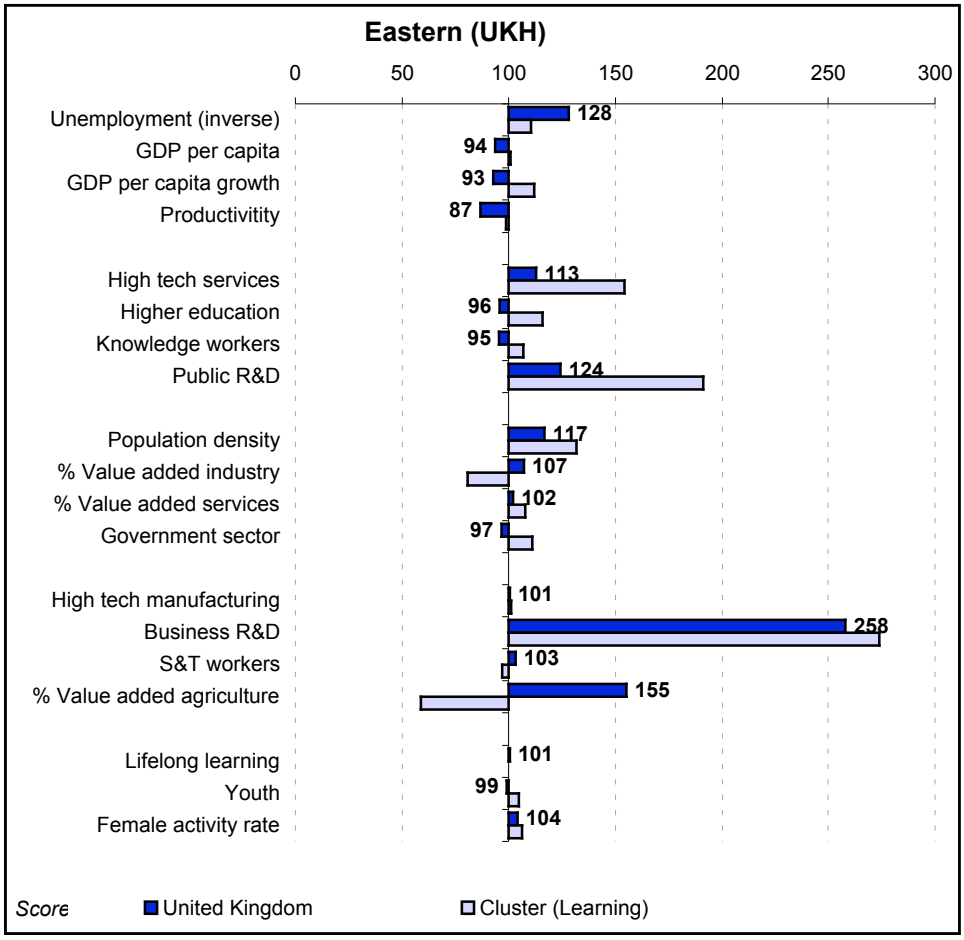
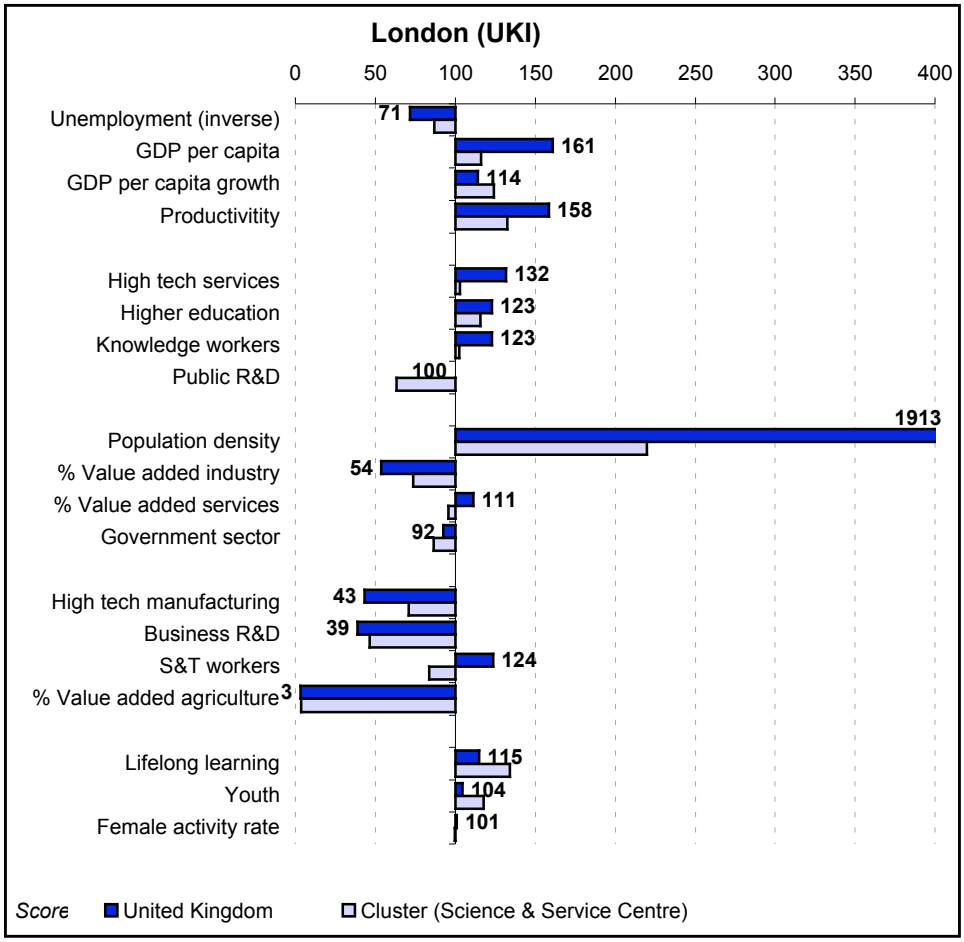
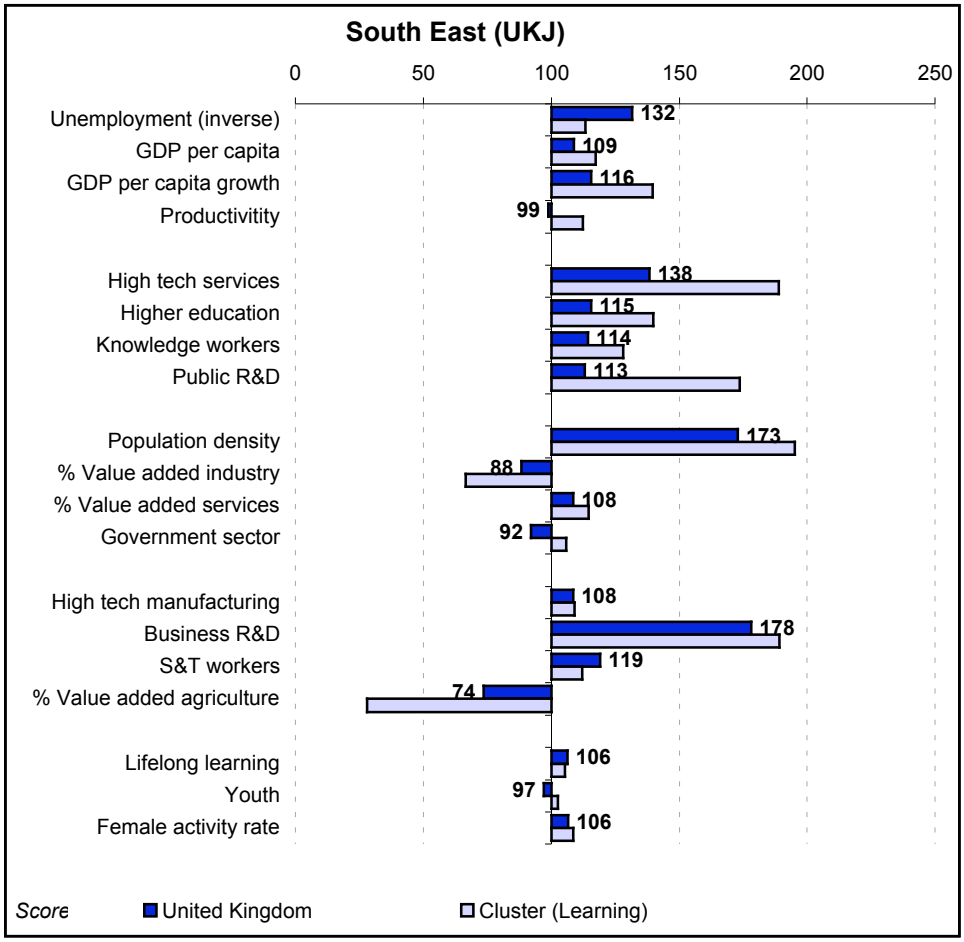
97
Score
United Kingdom
Cluster (Learning)

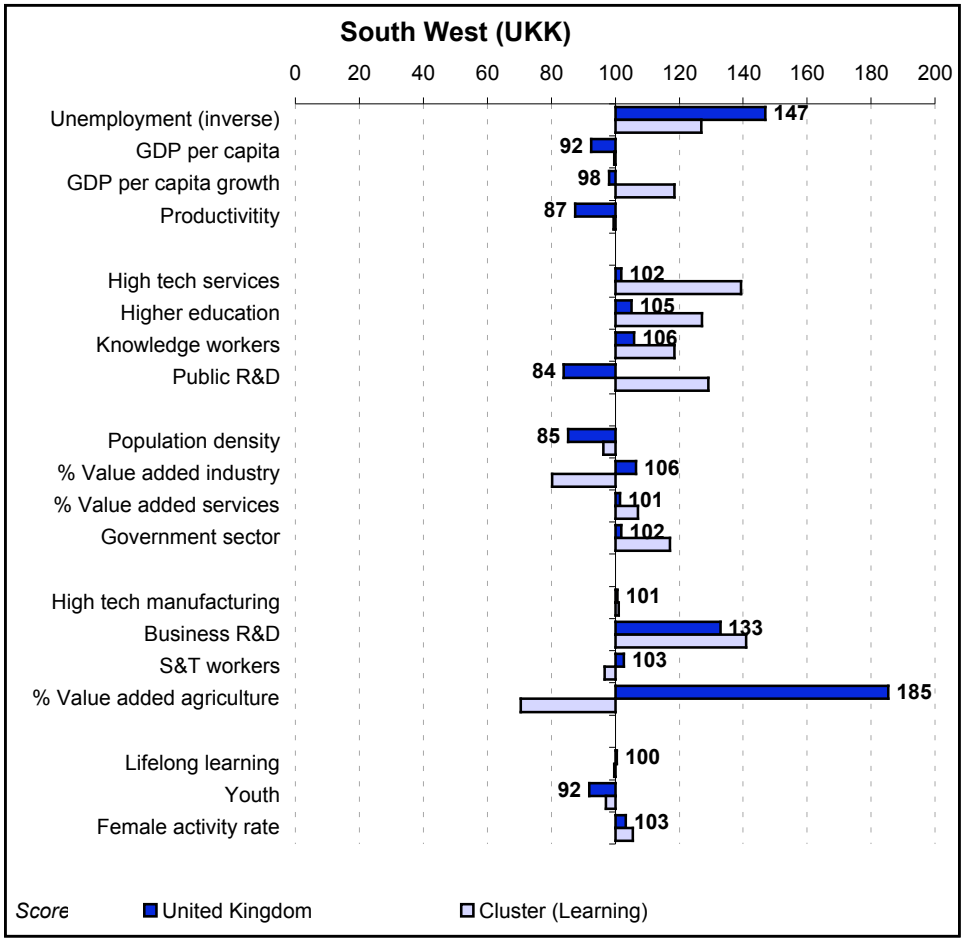

East Midlands (UKF)
0
20
40
60
80
100
120
140
160
180
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
114
88
83
84
74
84
80
74
111
134
94
90
129
137
87
157
96
97
101
Score
United Kingdom
Cluster (Learning)

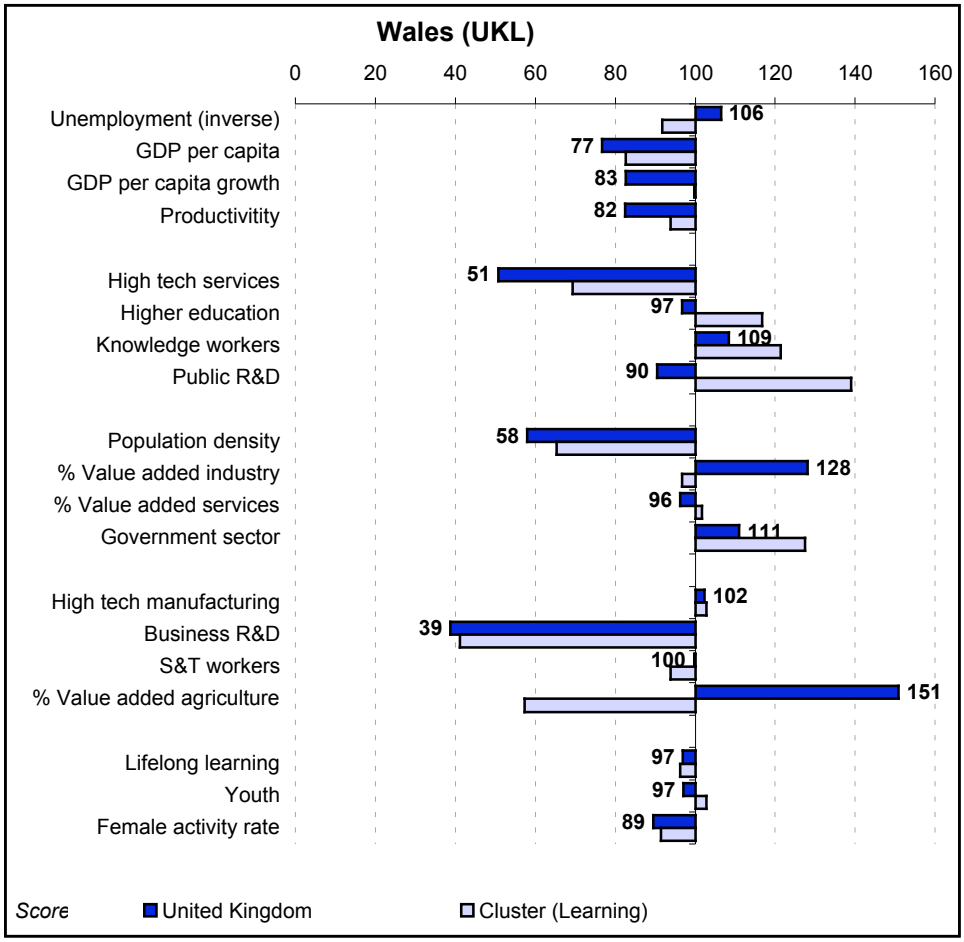

West Midlands (UKG)
0
20
40
60
80
100
120
140
160
180
200
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
88
89
89
88
91
84
82
53
168
126
97
76
162
71
82
119
98
101
99
Score
United Kingdom
Cluster (Learning)

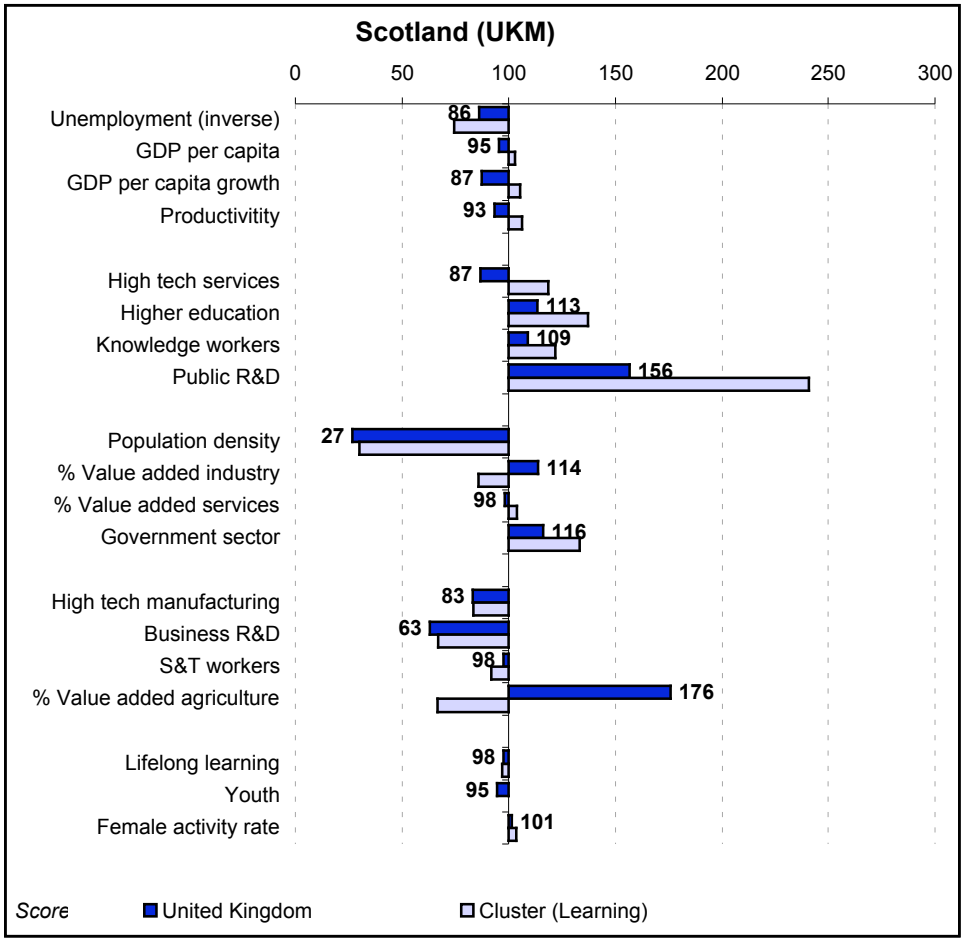

Eastern (UKH)
0
50
100
150
200
250
300
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
128
94
93
87
113
96
95
124
117
107
102
97
101
258
103
155
101
99
104
Score
United Kingdom
Cluster (Learning)

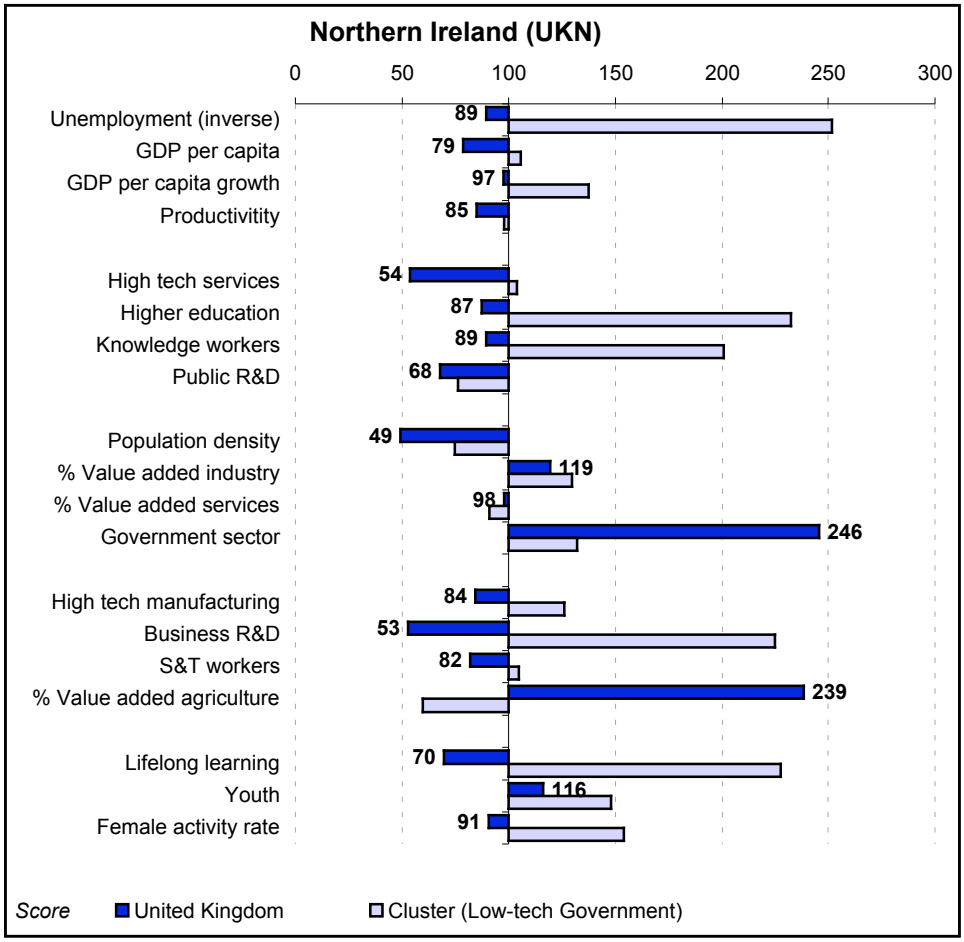

London (UKI)
0
50
100
150
200
250
300
350
400
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
71
161
114
158
132
123
123
100
1913
54
111
92
43
39
124
3
115
104
101
Score
United Kingdom
Cluster (Science & Service Centre)


South East (UKJ)
0
50
100
150
200
250
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
132
109
116
99
138
115
114
113
173
88
108
92
108
178
119
74
106
97
106
Score
United Kingdom
Cluster (Learning)


South West (UKK)
0
20
40
60
80
100
120
140
160
180
200
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
147
92
98
87
102
105
106
84
85
106
101
102
101
133
103
185
100
92
103
Score
United Kingdom
Cluster (Learning)


Wales (UKL)
0
20
40
60
80
100
120
140
160
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
106
77
83
82
51
97
109
90
58
128
96
111
102
39
100
151
97
97
89
Score
United Kingdom
Cluster (Learning)


Scotland (UKM)
0
50
100
150
200
250
300
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
86
95
87
93
87
113
109
156
27
114
98
116
83
63
98
176
98
95
101
Score
United Kingdom
Cluster (Learning)


Northern Ireland (UKN)
0
50
100
150
200
250
300
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
89
79
97
85
54
87
89
68
49
119
98
246
84
53
82
239
70
116
91
Score
United Kingdom
Cluster (Low-tech Government)

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[8];
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.

[8] 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

Programs	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
OBJECTIVE 1						
DOCUP OBJ1 CORNWALL AND THE ISLES OF SCILLY	102,683,610.00	98,446,530.00	4,237,080.00	497,844,000.00	300,906,000.00	100,968,000.00
DOCUP OBJ1 HIGHLANDS AND ISLANDS	65,811,000.00	65,811,000.00	0.00	319,854,639.00	190,101,740.00	62,349,716.00
DOCUP OBJ1 MERSEYSIDE	382,390,400.00	382,390,400.00	0.00	1,389,070,300.00	930,640,300.00	452,400,000.00
DOCUP OBJ1 SOUTH YORKSHIRE	211,446,198.00	203,358,790.00	0.00	1,221,488,700.00	833,146,700.00	365,292,000.00
DOCUP OBJ1 WEST WALES AND THE VALLEYS	379,345,269.40	360,595,269.40	18,750,000.00	1,933,946,500.00	1,163,011,000.00	615,220,000.00
PO obj. 1 Northern Ireland Transitional Support	189,203,504.00	189,203,504.00	0.00	929,115,400.00	537,129,400.00	284,986,000.00
OBJECTIVE 2						
DOCUP obj. 2 East Midlands	142,068,600.00	142,068,600.00	0.00	376,530,000.00	343,017,000.00	33,513,000.00
DOCUP obj. 2 East of England	102,432,505.00	102,432,505.00	0.00	164,730,900.00	150,155,340.00	14,575,560.00
DOCUP obj. 2 Eastern Scotland	146,853,900.00	146,853,900.00	0.00	261,546,500.00	261,546,500.00	0.00
DOCUP obj. 2 London	83,004,795.00	83,004,795.00	0.00	273,900,400.00	242,594,400.00	31,306,000.00
DOCUP obj. 2 North East of England	498,656,000.00	498,656,000.00	0.00	717,000,000.00	581,330,000.00	135,670,000.00
DOCUP obj. 2 North West England	310,288,940.00	310,288,940.00	0.00	841,436,400.00	841,436,400.00	0.00
DOCUP obj. 2 South East England	4,587,311.00	4,587,311.00	0.00	35,700,000.00	35,700,000.00	0.00
DOCUP obj. 2 South of Scotland	49,441,669.00	49,441,669.00	0.00	76,313,200.00	76,313,200.00	0.00

DOCUP obj. 2 South West of England	79,153,326.90	79,153,326.90	0.00	199,859,000.00	164,849,000.00	35,010,000.00
DOCUP obj. 2 West Midlands	27,727,600.00	27,727,600.00	0.00	889,519,600.00	745,121,600.00	144,398,000.00
DOCUP obj. 2 Western Scotland	324,642,450.00	324,642,450.00	0.00	504,465,700.00	437,594,450.00	66,871,250.00
DOCUP obj. 2 Yorkshire and the Humber	221,385,106.30	221,385,106.30	0.00	538,670,200.00	469,190,200.00	69,480,000.00
East Wales	48,269,970.00	48,269,970.00	0.00	126,441,100.00	126,441,100.00	0.00
Gibraltar	336,280.00	336,280.00	0.00	8,743,600.00	8,743,600.00	0.00
Total Regional OPs	**3,369,728,434.60**	**3,338,653,946.60**	**22,987,080.00**	**11,306,176,139.00**	**8,438,967,930.00**	**2,412,039,526.00**

CODES	ALLOCATED	DISBURSED	EXPENDITURE CAPACITY
OBJECTIVE 1			
152 - Environment-friendly technologies, clean and economical energy technologies (only for large enterprises)	30,610,850.00	12,537,627.95	41.0%
153 - Business advisory services (including internationalisation, exporting and environmental management, purchase of technology) (only for large enterprises)	23,271,850.00	14,412,557.91	61.9%
155 - Financial engineering (only for large enterprises)	9,703,629.00	9,786,557.97	
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	72,583,500.00	33,421,043.01	46.0%
163 - Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (only for SMEs)	317,550,267.80	162,846,634.22	51.3%
164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	233,302,370.60	123,237,824.62	52.8%
165 - Financial engineering (only for SMEs)	217,504,750.00	173,476,687.94	79.8%
181 - Research projects based in universities and research institutes	113,481,168.60	53,186,846.38	46.9%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	206,289,387.70	113,447,161.69	55.0%
183 - RTDI infrastructure	106,582,207.70	65,077,895.35	61.1%
TOTAL OBJ. 1	**1,330,879,981.40**	**761,430,837.05**	**57.2%**

OBJECTIVE 2			
152 - Environment-friendly technologies, clean and economical energy technologies (only for large enterprises)	3,888,529.00	1,375,289.30	35.4%
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	29,496,098.85	17,668,716.84	59.9%
163 - Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (only for SMEs)	771,671,734.70	397,387,613.99	51.5%
164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	745,558,566.65	412,525,064.42	55.3%
165 - Financial engineering (only for SMEs)	249,250,916.00	178,719,802.95	71.7%
18 - Research, technological development and innovation (RTDI) - detailed information unavailable	27,727,600.00	15,687,022.29	56.6%
181 - Research projects based in universities and research institutes	13,940,269.00	7,166,476.23	51.4%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	143,051,174.00	84,946,307.82	59.4%
183 - RTDI infrastructure	54,263,565.00	30,560,150.11	56.3%
TOTAL OBJ. 2	**2,038,848,453.20**	**1,146,036,443.94**	**56.2%**

OBJECTIVES	ALLOCATED	DISBURSED TOTAL SF	EXPENDITURE CAPACITY
Objective 1	1,330,879,981.40	761,430,837.05	57.2%
Objective 2	2,038,848,453.20	1,146,036,443.94	56.2%

Categories 181 to 184 plus :
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

D.1.2 Broad innovation and knowledge economy funding

Programs	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
OBJECTIVE 1						
DOCUP OBJ1 CORNWALL AND THE ISLES OF SCILLY	144,498,720.00	140,261,640.00	4,237,080.00	497,844,000.00	300,906,000.00	100,968,000.00
DOCUP OBJ1 HIGHLANDS AND ISLANDS	69,711,300.00	69,711,300.00	0.00	319,854,639.00	190,101,740.00	62,349,716.00
DOCUP OBJ1 MERSEYSIDE	447,101,700.00	447,101,700.00	0.00	1,389,070,300.00	930,640,300.00	452,400,000.00
DOCUP OBJ1 SOUTH YORKSHIRE	211,446,198.00	203,358,790.00	0.00	1,221,488,700.00	833,146,700.00	365,292,000.00
DOCUP OBJ1 WEST WALES AND THE VALLEYS	473,461,769.40	454,711,769.40	18,750,000.00	1,933,946,500.00	1,163,011,000.00	615,220,000.00
PO obj. 1 Northern Ireland Transitional Support	200,253,504.00	200,253,504.00	0.00	929,115,400.00	537,129,400.00	284,986,000.00
OBJECTIVE 2						
DOCUP obj. 2 East Midlands	170,066,750.00	170,066,750.00	0.00	376,530,000.00	343,017,000.00	33,513,000.00
DOCUP obj. 2 East of England	102,432,505.00	102,432,505.00	0.00	164,730,900.00	150,155,340.00	14,575,560.00
DOCUP obj. 2 Eastern Scotland	146,853,900.00	146,853,900.00	0.00	261,546,500.00	261,546,500.00	0.00
DOCUP obj. 2 London	89,948,130.00	89,948,130.00	0.00	273,900,400.00	242,594,400.00	31,306,000.00
DOCUP obj. 2 North East of England	498,656,000.00	498,656,000.00	0.00	717,000,000.00	581,330,000.00	135,670,000.00
DOCUP obj. 2 North West England	333,546,440.00	333,546,440.00	0.00	841,436,400.00	841,436,400.00	0.00
DOCUP obj. 2 South East England	4,587,311.00	4,587,311.00	0.00	35,700,000.00	35,700,000.00	0.00
DOCUP obj. 2 South of Scotland	49,441,669.00	49,441,669.00	0.00	76,313,200.00	76,313,200.00	0.00
DOCUP obj. 2 South West of England	83,384,826.90	83,384,826.90	0.00	199,859,000.00	164,849,000.00	35,010,000.00
DOCUP obj. 2 West Midlands	57,467,000.00	57,467,000.00	0.00	889,519,600.00	745,121,600.00	144,398,000.00
DOCUP obj. 2 Western Scotland	324,642,450.00	324,642,450.00	0.00	504,465,700.00	437,594,450.00	66,871,250.00
DOCUP obj. 2 Yorkshire and the Humber	236,549,970.00	236,549,970.00	0.00	538,670,200.00	469,190,200.00	69,480,000.00
East Wales	55,128,900.00	55,128,900.00	0.00	126,441,100.00	126,441,100.00	0.00
Gibraltar	756,630.00	756,630.00	0.00	8,743,600.00	8,743,600.00	0.00
Total Regional OPs	**3,699,935,673.30**	**3,668,861,185.30**	**22,987,080.00**	**11,306,176,139.00**	**8,438,967,930.00**	**2,412,039,526.00**

CODES	ALLOCATED	DISBURSED	EXPENDITURE CAPACITY
OBJECTIVE 1			
152 - Environment-friendly technologies, clean and economical energy technologies (only for large enterprises)	30,610,850.00	12,537,627.95	41.0%
153 - Business advisory services (including internationalisation, exporting and environmental management, purchase of technology) (only for large enterprises)	23,271,850.00	14,412,557.91	61.9%
155 - Financial engineering (only for large enterprises)	9,703,629.00	9,786,557.97	
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	72,583,500.00	33,421,043.01	46.0%
163 - Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (only for SMEs)	317,550,267.80	162,846,634.22	51.3%
164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	233,302,370.60	123,237,824.62	52.8%
165 - Financial engineering (only for SMEs)	217,504,750.00	173,476,687.94	79.8%
181 - Research projects based in universities and research institutes	113,481,168.60	53,186,846.38	46.9%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	206,289,387.70	113,447,161.69	55.0%
183 - RTDI infrastructure	106,582,207.70	65,077,895.35	61.1%
322 - Information and Communication Technology (including security and safe transmission measures)	55,267,130.00	29,623,713.81	
324 - Services and applications for SMEs (electronic commerce and transactions, education and training, networking)	160,326,080.00	79,753,458.18	
TOTAL OBJ. 1	**1,546,473,191.40**	**870,808,009.04**	**56.3%**

OBJECTIVE 2			
152 - Environment-friendly technologies, clean and economical energy technologies (only for large enterprises)	3,888,529.00	1,375,289.30	35.4%
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	29,496,098.85	17,668,716.84	59.9%
163 - Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (only for SMEs)	771,671,734.70	397,387,613.99	51.5%
164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	745,558,566.65	412,525,064.42	55.3%
165 - Financial engineering (only for SMEs)	249,250,916.00	178,719,802.95	71.7%
18 - Research, technological development and innovation (RTDI) - detailed information unavailable	27,727,600.00	15,687,022.29	56.6%
181 - Research projects based in universities and research institutes	13,940,269.00	7,166,476.23	51.4%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	143,051,174.00	84,946,307.82	59.4%
183 - RTDI infrastructure	54,263,565.00	30,560,150.11	56.3%
32 - Telecommunications infrastructure and information society	29,739,400.00	16,032,423.90	53.9%
322 - Information and Communication Technology (including security and safe transmission measures)	42,806,370.00	20,533,941.71	48.0%
324 - Services and applications for SMEs (electronic commerce and transactions, education and training, networking)	42,068,258.70	19,535,865.51	46.4%
TOTAL OBJ. 2	**2,153,462,481.90**	**1,202,138,675.06**	**55.8%**

OBJECTIVES	ALLOCATED	DISBURSED TOTAL SF	EXPENDITURE CAPACITY
Objective 1	1,546,473,191.40	870,808,009.04	56.3%
Objective 2	2,153,462,481.90	1,202,138,675.06	55.8%

This third calculation adds RTDI plus business (innovation & technology) support plus information society. As D.1.1 plus:
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)

D.2 Summary of key policy measures per programme

Exhibit 12: main measures in favour of innovation and knowledge

Identified RTDI measure or major project		Focus of intervention (Policy areas classification)*	Main Instruments**	Main beneficiaries***
Programme	**Number and title of the measure**			
England				
SPD Obejective 1 Merseyside	1.1 Improve SME Competitiveness	3, 6	Aid schemes	Private sector
	1.2 Business Start-ups and Entrepreneurship	5	Aid schemes	Private sector
	1.4 Training for SMEs	3	Aid schemes / Education and training	Private sector
	1.5 Sites and Premises	4	Infrastructures and facilities	Private sector / Networks
	1.3 Funding for growth	2	Aid schemes	Private sector
SPD Objective 1 South Yorkshire	1.1 Exploiting a business centred research capacity	3	Aid schemes / Infrastructures and facilities	Private sector / Public sector
	1.2 Investing in target SMEs	5	Aid schemes	Public sector
	1.3 Developing growth sector start-ups	4, 5	Aid schemes	Private sector / Networks /Public sector
	1.4 Attracting Growth Sector Champions	2	Aid Schmes	Private Sector
	2.6 Exploting New Market Opportunities	5	Aid schemes	Private sector
	2.7 Accelerating the adoption and transfer of new technologies, products, processes	3	Aid schemes	Private sector / Public sector
	2.8 Maximising the potential presented by e-business	3, 5	Aid Schemes	Private sector/Public sector
	5.27 Seizing the opportunities of strategic economic zones	3, 5	Aid Schemes	Private sector/Public sector
	6.32 Improving access to finance for SME businesses	2	Aid Schemes	Private sector
SPD Objective 1 Cornwall and Scilly	1.1 Creating the economic conditions for competitive SMEs	3, 5	Infrastructure and facilities	Private sector / Networks
	1.2 Financial Engineering for SMEs	2	Aid schemes	Private sector
	1.3 Developing competitive business	5	Aid schemes	Private sector
	1.5 Supporting Entrepreneur	5	Aid schemes	Private sector
	1.6 Developing Sectors with Growth Potential	5	Aid schemes / Education and training	Private sector
	3.2 Learning for Competitive Business and for Enterprise Adaptability and	2	Aid schemes / Education and training	Private sector

	Entrepreneurship			
	5.3 The Knowledge Driven Region	3	Infrastructure and facilities	Public sector/ Private sector
	5.4 Research and Knowledge	2	Education and training / Aid schemes	Public sector
SPD Objective 2 West Midlands	1.1 Support for Product and Process Development	6	Aid schemes	Private sector
	1.3 Support to SMEs for new markets	5	Aid schemes	Private sector
	1.4 Management and development and entrepreneurial skills	5	Aid schemes	Private sector
	1.7 Support for higher level skills to improve the transfer of technologies between education and business	3	Aid schemes/Education and training	Private sector / Networks /Public sector
	1.8 Business support for growth and embrionic clusters	5	Aid schemes	Private sector / Networks
	1.9 Support for new business strat-ups	5	Aid schemes	Private sector
	1.10 Creation of specialised businessspace and facilities	3	Infrastructure and facilities	Private sector / Networks /Public sector
	1.14 Developing e-businesses	3	Aid schemes	Private sector
	1.15 Funding for Entrepreneurs and Innovation Readness	5	Aid schemes	Private sector
SPD Objective 2 North West of England	1.1 Creation and Establishment of Entrepreneurial Business Start-ups	5	Aid schemes	Private sector
	1.2 Increasing the Competitiviness of Established SMEs	5	Aid schemes	Private sector
	1.3 Access to Investment Finance for Growth SMEs	2	Aid schemes	Private sector
	1.4 Developing the Regional Knowledge Economy Supporting Business Innovation and Networking	4	Aid schemes	Networks
	1.5 Investment in Premises for New and Expanded SMEs	3	Infrastructure and facilities	Networks
SPD Objective 2 North East of England	1.1 Growing New Business and Matching Entrepreneurs with Ideas	5	Aid schemes	Private sector
	1.2 Access to Finance	2	Aid schemes	Private sector
	2.1 Support for the expansion of SMEs	5	Aid schemes	Private sector
	2.4 Technology Transfer	3	Aid schemes/Education and training	Private sector / Networks /Public sector
	2.5 Clusters and Poles	4	Infrastructure and facilities / Aid Schemes	Private sector
	2.8 Training and Development - Technology	3	Education and training	Public sector/ Private sector
SPD Objective 2	1.1 Targeted Support for New Entrepreneurs and New Areas	5	Aid schemes	Public sector/ Private sector

Yorkshire and Humber	of Employment Intensive Growth			
	1.2 Targeted Support for Entrepreneurs in High GVAS and "Step Change" Enterprises	5	Aid schemes	Public sector/ Private sector
	1.4 People Skills for the New Objective 2 Entrepreneur Agenda	5	Aid schemes	Public sector/ Private sector
	2.2 Helping Business Adapt to the Demands of New Product and Process Innovation	4	Aid schemes	Private sector / Networks /Public sector
	2.3 Exploiting the Potential of E-Business and Consolidating Capital Development in Transitional Areas	3	Aid schemes	Public sector/ Private sector
	5.1 Investment Partnership	2	Aid schemes	Private sector / Networks /Public sector
SPD Objective 2 East Midlands	1.1 Supporting the ICT Revolution, Technology Development and Business Innovation	3	Aid schemes	Public sector/ Private sector
	1.2 Financial Support for SMEs and the Social Economy	5	Aid schemes	Private sector
	1.3 Business Development for SMEs and the Social Economy	5	Aid schemes	Private sector
	1.4 Learning and Skills for a Competitive Economy	2	Aid schemes/Education and training	Public sector/ Private sector
	2.1 Strategic Development Opportunities	5	Aid schemes / Infrastructures and facilities	Private sector
	2.2 Economic Infrastructure	3	Infrastructure and facilities	Private sector
SPD Objective 2 London	2.1 Advice and Monitoring for SME Start-ups	5	Aid schemes	Private sector
	2.2 SME Business Development Programmes	5	Aid schemes	Private sector
	2.3 Funding for Growth	2	Aid schemes	Private sector
	2.4 Adopting New Technology, E-Commerce, and ICT	3	Aid schemes	Private sector / Networks
	2.5 Product, Process and Technology Innovation	6	Aid schemes/Education and training	Public sector/ Private sector
	2.6 Environmental Technology	6	Aid schemes/Education and training	Public sector/ Private sector
	2.7 Developing a Competitive Workforce	5	Aid schemes/Education and training	Private sector
	2.8 Micro-Loans for Business Start-ups	5	Aid schemes	Private sector
SPD Objective 2 South West of England (1)	2.1 Support for Start-ups and Micro enterprises	3,5	Aid schemes	Private sector
	2.2 Support for SME Development	5,6	Aid schemes	Private sector

	2.3 Business Support for Technology and Knowledge Based Industries	2,3	Aid schemes	Private sector
	2.4 Creating a Better Environment for Business	3,4	Aid schemes	Private sector
	2.5 Management and Skills Development for SMEs	2,5	Aid schemes	Public sector/ Private sector
SPD Objective 2 East of England	1.1 Promoting SME creation, growth and development	4,5	Aid schemes	Private sector / Networks
	1.2 Improving SME's access to capital	2	Aid schemes	Private sector
	1.3 Micro-loan fund	5	Aid schemes	Private sector
	2.1 Developing key locations	3	Infrastructure and facilities	Public sector/ Private sector
	2.2 Developing key clusters/sectors	2	Aid schemes	Private sector / Networks /Public sector
	2.3 Developing skills for employment and opportunities within key locations and clusters/sectors	2	Aid schemes	Private sector / Networks /Public sector
SPD Objective 2 South East	1.1 Sustaining Growth SMEs and Micro-Businesses	2,5	Aid schemes	Private sector / Networks
	1.2 Innovation and Growth Through Technology	3,4	Aid schemes	Private sector / Networks /Public sector
	1.3 Business Development and Innovation	4,6	Aid schemes / Infrastructures and facilities	Private sector / Networks
Wales				
SPD Objective 1 West Wales and Valleys	1.1 Financial Support for SMEs	5	Aid schemes	Private sector
	1.2 Promoting Entrepreneurship and Increasing the Birth Rate of SMEs	5	Aid schemes	Private sector
	1.3 Developing Competitive SMEs	5	Aid schemes	Private sector
	2.2 Stimulate and Support Demand for ICT	3	Aid schemes	Private sector
	2.3 Support for the Development of Innovation and Research and Development	3,4,6	Aid schemes / Infrastructures and facilities	Private sector/ Public sector/ Networks
	2.4 Skills for Innovation and Technology	2	Aid schemes/Education and training	Private sector / Public sector
	2.5 Clean Energy Sector Developments	6	Aid schemes	Private sector/ Public sector/ Networks
SPD Objective 2 East Wales	1.1 Support for Enterprise, Innovation and SME Development	3,4,6	Aid schemes	Private sector/ Public sector/ Networks
	1.2 Financial Support for SMEs	5	Aid schemes	Private sector
	1.3 Developing of Sites and Premises for SMEs	3	Infrastructures and facilities	Private sector / Public sector
Scotland				
SPD Objective 1 Highlands	1.1 Enhance marketing, advisory and information service to existing and new	5	Aid schemes	Private sector

and Islands	businesses			
	1.2 Stimulate Private Sector Investment in Existing and New Businesses	5	Aid schemes	Private sector
	1.3 Support development of innovation and R&D, including industry-academic links	2,3,6	Aid schemes / Education and training	Private sector / public sector / networks
	1.4 Overcome market failure in the provision of serviced sites and premises for business	3	Infrastructures and facilities	Private sector
SPD Objective 2 East of Scotland	1.1 SME Creation & Development	5	Aid schemes	Private sector
	1.2 Access to Risk Capital	2,5	Aid schemes	Private sector
	1.3 Technology & Knowledge Transfer	2,3,6	Aid schemes / Education and training	Private sector / public sector / networks
	2.1 Strategic Locations and Sectors (Revenue)	5	Aid schemes	Private sector / public sector / networks
	2.2 Strategic Locations and Sectors (Capital)	4	Infrastructures and facilities	Private sector / public sector / networks
SPD Objective 2 West of Scotland	1.1 Enhance access to finance for SMEs	2	Aid schemes	Private sector
	1.2 Enhance SME advice & support services to develop a competitive and innovative business base	3,5	Aid schemes	Private sector
	1.3 Develop a competitive workforce	2,3	Aid schemes / Education and training	Private sector
	2.2 Develop SMEs facilities to support competitive sectors and clusters outside the strategic sites and urban area regeneration plans	4	Aid schemes / Infrastructures and facilities	Private sector / Networks
SPD Objective 2 South of Scotland	1.1 Enhancing Advisory Structures for SMEs	4,5	Aid schemes	Private sector/ Networks
	1.2 Encouraging Investment in SMEs	5	Aid schemes	Private sector
	1.3 Developing Innovation, Technology, and the Information Society	3,4,6	Aid schemes	Private sector
	2.1 Sites, Premises, Locations	3	Infrastructure and facilities	Private sector / public sector / networks
	2.3 SME Access to Capital	2	Aid schemes	Private sector
Gibraltar				
SPD Objective 2 Gibraltar	1.2 SMEs/E-Commerce	3,5	Aid schemes	Private sector
Northern Ireland				
Northern Ireland Programme for Building Sustainable Prosperity	1.1A Business Support Enterprise	5	Aid Schemes	Private sector
	1.1B Business Support - Competitive Excellence Support	5	Aid Schemes	Private sector
	1.1C Business Support - Small Business Support Network	4	Aid Schemes	Networks

	1.2 Research and Technology Development and Technology Transfer	3,6	Aid Schemes	Public sector / Private sector/ networks
	1.5 Information Society	3	Aid Schemes	Private sector
	1.7 Telecommunications	3	Infrastructure and facilities	Public sector / Private sector
	2.6 Developing Entrepreneurship	5	Aid Schemes/Education and Training	Private sector
PEACE II Operational Programme	1.1 Business Competitiveness and Development	2,5	Aid schemes	Private sector
	1.4 Promoting Entrepreneurship	5	Aid schemes	Private sector
	1.8a Technology Support for the Knowledge Based Economy (Innovation Technology Networking)	3,6	Aid schemes / Infrastructures and facilities	Private sector / Networks /Public sector
	1.8b Technology Support for the Knowledge Based Economy (Information Age)	3	Aid schemes	Private sector
		1- Note - In 2004 the measures 2.1, 2.2, and 2.3 has been combined in 2.6 SMEs Development and 2.7 Business support to transition areas.		
Legend				
Code	Policy area			
1	Improving governance capacities for innovation and knowledge policies			
2	Innovation friendly environment			
3	Knowledge transfer and technology diffusion to enterprises			
4	Innovation poles and clusters			
5	Support to creation and growth of innovative enterprises			
7	Boosting applied research and product development			

* 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 sectors; Private sectors; Networks

Main source: Single Programme Documents and Evaluation Reports

Appendix E Case studies

Name of Case (related policy measure or action)
Title Technium Network **Description** Technium is a growing network of locations across Wales that provide incubation space, facilities, and services for technology-led businesses. Structural Funds have been used to support the network, with the aim of creating a central 'Technium' in each area of Wales, linked to further sector-specific Technium and catering for key growth industries. **Zone** Objective 1 programme in West Wales and The Valleys. The project is financed under the measure 2.3 "Support for the development of innovation and research and development".
Brief history and main features
Policy area and managing authority The scheme aims to promote knowledge transfer and technology diffusion to enterprises. The Welsh Development Agency, the managing authority of the scheme, describes the development of the network as 'the birth of a new world class commercial concept' and it is intended to provide the knowledge, support and technical facilities that will help young technology businesses in Wales realise their potential for long-term growth. Technium Centres are predominantly run by partnerships of organizations from the public and private sector. Current partnerhips include local and national Government, academic institutions and international companies. **Main instruments and structure of the initiatives** The Welsh Development Agency describes Technium as a network of state-of-the-art facilities supported by the latest information technology coupled with business and technical support staff. 10 Techniums exist at present but eventually the 150 MGBP network is to comprise 13 sites across the region to encourage cluster development in pre-defined "key sectors" such as optoelectronics, digital media, IT, sustainable technologies, automotive technologies and the biosciences. The sites provide access to specialist laboratory facilities and communal networking areas and group together fledgling start-ups, entrepreneurs, researchers, developers, and industrial market leaders. Academic support is offered through local Centres of Research Excellence. In addition, Technium Associate Members allows knowledge based businesses outside of the centres to benefit from access to support partners, networking, advice and discounted facilities. Finally, a team of specialist business and marketing support advisors are available to support growth and development of knowledge based businesses at Technium Centres. **Main beneficiaries** The main objectives of Technium is to encourage partnerships between the public sector, academia and the private sector, attract R&D projects, and provide employment opportunities to the region's 12000 annually technology graduates. **Degree of novelty of the initiative** The Technium Network was established in response to Welsh Assembly targets to drive forward enterprise and innovation. The Technium concept revolved around a unified, integrated and partnership-based approach to business support. It works with businesses at various stages of development to overcome barriers, nurture growth and encourage competitiveness through developing and enterprise climate and affordable access to necessary infrastructure and facilities.
Main results
Main outcomes The network began with the opening of the flagship Technium Centre in Swansea in 2001. Others have followed it, but the process is ongoing, with further locations under construction or planned for the future. There are currently more than 50 companies resident in Technium Centres across Wales, but it is hoped that more than 200 will eventually benefit when the

network is complete.
The original centre, Technium Swansea, consists of two buildings, which houses businesses across a range of sector, including ICT, software, telecommunications, pharmaceuticals, multi-media, electronics and engineering. 19 companies are currently resident at this Technium, employing 227 people in total. The two units are 85% and 75% occupied currently. Technium Digital at Swansea University supports young technology businesses and is now fully occupied with 9 resident companies employing around 30 people. Its satellite centre, Technium Digital@Sony, based at the Sony Technology Centre can accommodate a further 8 companies. 2 companies are located in the recently completed Technium Sustainable Technologies, which can support 33 businesses employing around 150 employees within its 3,397 sq.m. 25 companies with 160 jobs have to-date been resident at Technium OpTIC North Wales, which is specialized in optoelectronics and connected with the University of Wales. Technium CAST, specialized in communication and software technologies, includes 6,500 sq.m. of laboratories and 16 businesses with almost 250 employees. Other Techniums around Wales are: Technium Aberystwyth, Technium Performing Engineering, and Technium Permbrokershire.

Benefits and Impacts

The Technium Network has provided opportunities for both Welsh companies and for inward investment in R&D facilties, and encourages cluster development in key sectors. It has also helped the Welsh economy to exploit talents, provide employment opportunities, and act as a catalyst for wider regeneration in the country.
The additional second building in Swansea is a good indication of the success of the programme, having been built to provide expansion space for tenants in the original flagship building who had outgrown the space. It has been only five years since the first Technium location was established, but the flagship centre at Swansea has seen growth amongst its tenants, with an average increase in turnover over the first three years of 39%, and staff growth of 306%. In addition, three quarters of the staff at this location are graduates and 72% are involved in research and development.

Reasons of success and conditions for repeatability

Main lessons

As the programme has developed and expanded gradually over a number of years, and continues to develop even now, it has been able to benefit from the lessons it has learned at each stage of the process. For instance, following the addition of expansion accommodation at the Swansea Technium, later locations have included additional site space to allow the future growth and expansion needs of tenants. Technium has also benefiting from collaborating closely with the University of Wales in the development of the network. The WDA worked with the academic sector to identify best fit between the universities key research departments and the needs of local industry. The aim is to facilitate spin out opportunities from the University.
Technium has also had some problems. Several companies have pulled out of the programme for various reasons. Agilent, a small American software business that was one of the first arrivals closed at the end of 2002. One argument is that Techniums tend to be located remote from universities, industry, and market. Another argument is that business service and marketing support is inefficient. However, some cases of Technium centres remain extremely positive and they represent good practice applicable in other contexts. This the case of Technium Swansea, which was the highest placed UK centre in a recent international competition designed to find the best science based incubator.

Name of Case (related policy measure or action)
Title Up&Running Programme also known as London New Business Creation **Description** The Up&Running Programme is aimed at implementing a strong, client focussed pan-London framework of services to support the development of sustainable new business growth. **Zone**: Objective 2 London. The programme is financed under two measures: 2.2, "SME Business and Development Programmes", and 2.8, Micro Loans for Business Start-ups".
Brief history and main features
Policy area The policy area is "Support to creation and growth of innovative enterprises". Interest in targeted support of new and small businesses has grown in the UK since the early 1990s. This is in response to a perceived link between new business start up and growth. As a result a number of initiatives and funding streams have been made available to facilitate new business formation. The UP&Running programme in London is one of the responses to this policy challenge, subsequently tailored to meet particular needs of entrepreneurs in the London region. London has a very strong entrepreneurial culture and track record with an estimated 34000 new businesses being started annually. The development of new enterprises is an essential element in securing London's long term economic growth: the small business sector provides employment, encourages competition and, in many sectors, is a valuable contributor to new products and service innovation. Yet only 60% of new enterprises in London survive their first three years of operation. Consequently, the programme aims also to reduce the vulnerability of new enterprises. **Main Instruments and beneficiaries** The programme includes several delivery mechanisms. Support services to start-ups and high growth start-ups include offering of information, advice, guidance, networking, training, and access to specialist services. This includes intensive support through mentoring services where the customer is provided with a registered mentor, who acts as an adviser and accesses a range of local and regional business support to meet needs. Another delivery mechanism is called development projects, which include access to property service, mid-term evaluation, forward strategy, customer satisfaction surveys, on-line services development, entrepreneurship research, and special needs fund. Another class of project is called Higher Education Links Project. These projects cover costs for the position of HE links project manager, the position of a knowledge broker, start-up support services to creative industries sector, and events and marketing support. Loans are the last delivery mechanism. The target of these instruments is start-up businesses with potential to grow and employ people. Mechanisms, particularly access to loans, are also delivered to members of socially and economically disadvanted people, who have been refused finance from a mainstream lender. **Programme management and organizations involved** Four organizations are involved in the Up&Running Programme. London Development Agency (LDA) ensures funds for the programme. London Business Support Network (LBSN) is an informal network of key organizations that provide or influence business support across all the London Boroughs. They provide start up advice and support, information on raising finance, marketing, exporting, business planning, and networking. Business Link for London (BLL) is the accountable body and so it is responsible for the financial management of the programme ensuring that public funds are putting in place effectively. It also responsible for monitoring and evaluation tasks. In addition, it delivers support services to high-growth start-ups. Enterprise Support Organisation (ESO) provides services support to start-ups. From a financial point view, the programme is funded by a combination of British funds and ERDF/ESF funds. **Key features of the programme** The programme has several key aspects, which make it an interesting practice. It provides an inclusive approach to start-up support through a Business Link for London branded Core Service Offer, which delivers solutions for clients with the

skills and abilities to turn their products and processes into sustainable businesses. It includes a wide coherent approach to marketing managed by Business Link for London with flexibility to take account of specific sub-regional and local circumstances. In addition, the initial diagnostic phase uses also interactive tools to profile clients, help clients assess their needs and create action plans in line with their business aspirations. And finally, as already mentioned, loan fund is directed at new businesses with growth potential for members of financially, economically and socially disadvantaged groups.

Main results

Main outcomes

The programme is started in 2000 and it will finish at the end of 2006. The mid-term evaluation at the end of 2003 reveals the following results: 2777 jobs created, 5084 people trained, 1297 new business start-ups, 2431 new business supported, 1165 new start-ups survived for 52 weeks, and 677 for 78 weeks. Considering that these data are related to a period in which the programme was just half way through the 52% of its life, these results were very promising. For example, in terms of jobs creation, the programme achieved the 36% of the entire target; in terms of people trained the 99%, in terms of business created the 27%, and in terms of business supported the 60%.

Expected prospects

The programme was launched with the following strategic objectives: the creation of 3,760 business start-ups in Greater London; to engage London's Higher Education establishments in providing support to new growth businesses through the commercial exploitation of academic research ideas; to encourage new methods of business support that will lead to sustainable economic development with exploitation of new technology. The mid-term evaluation shown a very promising situation. The same study also reveals that stakeholders were trusting, arguing that the programme would have met all the targets. Some good indication of this prediction can be shown by some addional data from Business Link London. Since 2000, the programme has supported an enquiry service, which has handled 27,000 enquiries, trained 9,149 people, reviewed 8,691 business start-up businesses, and mentoring 4,227 businesses.

Reasons of success and conditions for repeatability

Main lessons

There are three layers of achievement expected of the Up&Running programme: numerical and financial outputs of the programme, usefulness and impact of the service, and its role as a pan-London business start-up support service. Regarding the first point, the mid-term evaluation reveals that the money has been used wisely on appropriate support that has been appreciated by the users as relevant and making impact on their business. Regarding, the usefulness and services offered, the programme has been able to help users in break market, financial, and technological barriers. The wide use of advice, information, and mentoring has been effective. There should be a more emphasis on the adoption and use of IT, and so consequently an effort on this issue would have been important. Finally, the programme is truly one of the few pan-London schemes in supporting entrepreneurship and business growth.

Problems and possible repeatability

The main obstacle experienced by the programme has been the complex process model, which involved four different actors. Particularly in the case of Business Link for London and Enteprise Support Organisations, during the initial phase of the programme they experience some tension in the perception of roles. In fact, they were both involved in services support, the Business Link with high-growth businesses and EBO with start-ups. Here a different path may be appropriate for the future, to apply high growth services at the right point in the business development process when and if they become 'investment ready'. Overall the programme has worked very satisfactorily and it can be repeated in the London region with more management flexibility. This experience can also be used in other contexts in order to promote entrepreneurship. It could be easily applicable in similar context to London where there are large number of possible entrepreneurs and large potential markets.

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http://www.dti.gov.uk/europe/structural.html

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http://www.objectiveone.com/index.htm
Documents used: Single Programme Document – Programme Complement – Mid-Term Evaluation for Objective 1 Cornwall and Scilly Programme.

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http://www.consumer.gov.uk/rda/info/#Index%20of%20Links%20&%20Guidance

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Appendix G Stakeholders consulted

Name	Position	Organisation
Daniel Gilbert	Innovation specialist	Government Office of London
Dennis Halsall	New European Development Fund Team	Government Office of East of England
Gordon McLaren	Programme Manager	East of Scotland European Partnership
John Pinnell	European Programme Manager	Government Office of South East
Anne Conaty	Innovation Specialist	DETINI – Northern Ireland
Tony Newson	Programme Executive Business Enterprise	Government Office of South Yorkshire and the Humber – Objective 1 South Yorkshire
Bernard McKeown	Innovation Spcialist	DETINI – Northern Ireland (PEACE II Programme)
Richard Nutter	Programme Director Objective 1 Merseyside	Government Office North West of England
Marie Willson	Business Support Manager	Government Office North East of England
Richard Watkins	Responsible for ERDF Implementation in the UK	Office for the Deputy Prime Minister
Carleen Kelemen	Director	Objetive One Partnership for Cornwall and the Isles of Scilly
Mark Yeoman	Deputy Director	Objective One Partnership for Cornwall and the Isles of Scilly