THE GREATER SOUTH EAST: THE ECONOMIC ENGINE OF THE UK

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Executive Summary

1. Introduction & Background

The Greater Southeast (GSE) region of the UK is among the world's most productive regional economies. It comprises a unique agglomeration of knowledge capabilities – 5 of the world's top-ranked universities, a hub for global finance, a vibrant technology sector, and it is a vital contributor to the UK economy.

Despite its strengths, the Greater Southeast is facing a set of challenges and opportunities which will play significantly into future competitiveness -- issues of globalization, the changing nature of competition, and new understanding about the role of strategic coordination in regional innovation. The three development agencies making up the GSE - EEDA, LDA, and SEEDA - are working with The Cambridge-MIT Institute to assess these challenges and opportunities and to deliver a consensus-based innovation strategy amongst the GSE's public and private sector leadership. This strategy will rely on inputs from the broad set of institutions that influence regional innovation, and an analytic foundation including economic and policy research, technology road mapping, and global best practice. As a first step in this process, EEDA, LDA, SEEDA, and CMI have conducted the foundational analysis and stakeholder dialogue to inform the development of a broad-based initiative. This report describes the results of this process and the resulting recommendations to advance a GSE Innovation Initiative designed to drive knowledge-based growth through specific new programmatic and policy interventions, and new institutional mechanisms for GSE-level planning, policy, and partnership activity.

2. Rationale and supporting evidence

The GSE Innovation Initiative has been developed to respond to the following issues:

i. The common and interdependent economic characteristics of the EEDA, LDA, and SEEDA regions define the GSE as an economic entity which benefits from a shared innovation policy and programmes.

   a. Only London, South East and Eastern regions are higher than the UK average in terms of productivity.

   b. The most prosperous part of the UK encompasses parts of all three regions within the GSE - London, the western part of the South East and the M11 corridor in the Eastern Region.

   c. The three regions are generally the best national performers in terms of the 5 drivers of competitiveness (enterprise, competition, skills, innovation and investment).

   d. The GSE combines the critical mass of human capital, industrial concentration, and business networks to define it as a distinct economic geography.

ii. The GSE is a critical asset for overall UK economic performance and its success provides direct derivative benefits to all UK regions.

a. Economic activity in the GSE comprises more than 43% of UK GDP with 35% of the population.

b. The GSE is an important market for businesses throughout the UK – as national markets (of which the GSE contributes nearly half) comprise the most important source of demand for firms throughout the UK.

c. Businesses in the GSE are more export orientated than businesses in other regions making significant contributions to UK trade performance.

    i. The Greater South East engaged in the most international trade with over 20% of the businesses identifying overseas markets as being most important compared to only 12% of firms in Scotland/Wales.

    ii. The Greater South East had the highest level of international competition compared to other meta regions – with 41% of firms facing some overseas competitors and with 10% of firms competing exclusively with overseas businesses.

d. The GSE is the 'ideas generating' region and innovation pole in the UK – with more than 52% of national patenting activity.

iii. The GSE is facing increasing competition from other European and global capital city regions.

a. The regions in the GSE have been falling in the World Regional Competitiveness rankings. Between 2004 and 2005 the South East fell from 40th to 55th; London fell from 46th to 56th; and the Eastern Region fell from 50th to 62nd.

b. Productivity in the regions within the GSE remains relatively low compared to the best performing world regions – London is ranked as 21st; the South East at 75th; and the Eastern region at 101st.

c. Globalisation is increasing the extent of global competition and the speed of change with new competition from SE Asia and Eastern Europe.

iv. Realizing the innovative and economic potential of the GSE will not happen organically and requires a broad-based initiative to identify, target, and coalesce strategic opportunities for leveraging research and industrial capabilities, supporting business growth, stimulating investment, and advancing social and economic opportunity.

a. Targeting those areas of where the geography of competitiveness and innovation indicate that a 'meta-region' approach would yield the greatest benefits for the GSE and the UK as a whole, both in terms of international competitiveness and regional success factors (impact = significant).

b. Identifying those areas where economies of scale indicate the benefits of meta-regional cooperation.

c. Identifying those areas where sharing best practice can improve institutional learning and competences.

3. Key actions, responsibilities, and next steps for GSE Innovation Initiative.

The efforts by EEDA, LDA, SEEDA, and PRI to assess the need and opportunities related to a GSE Innovation Initiative were informed by three elements, (1) a project steering committee to guide the effort and identify potential areas of strategic opportunity, (2) a series of research efforts to reveal relevant economic characteristics in the GSE and related areas, and (3) survey and workshop-based initiatives to understand stakeholder views. Through this analysis and the insight drawn from steering committee and stakeholder dialogue, we have identified the following recommendations which are outlined in further detail in the report:

1. GSE Autumn 2006 Science Technology and Industry spending review summit with OSI/Major of London: this is a one day event to be held in the fall of 2006 for the purpose of promoting the GSE initiative, announcing key initiatives, and encouraging stakeholder support and participation. (Estimated cost £20,000).
2. Technology Road Mapping: this activity will assess the GSE's innovative capabilities, resources, and institutions. These factors will be assessed in view of market factors and stakeholder interests to identify priority area of focus, with the collective advice of the three science and industry councils, for partnership, research, and investment opportunities to develop and enhance competencies for competitive advantage. (Estimated cost £80,000).
3. Harmonization of strategies for creating high growth companies: Common to EEDA, SEEDA, and LDA is the challenge in encouraging and enabling small and medium sized firms to meet their growth potential. Each of the RDAs has programmes and expertise in this area and it is recommended that these programmes be evaluated to determine opportunities for joint GSE-level programmes in areas such as best practices for advancing innovation; developing meta-networks; creating a GSE-level Business Fellows programme; medium-sized business programmes; and seed-funding and proof-of-concept programmes.
4. Promoting the GSE as a global brand for trade and investment with UKTI. (estimated cost £140,000 for focus groups and test marketing).
5. Identify the umbrella leadership, institutional ownership, and coordinating framework and mechanisms for driving the above activities; evaluate need and draft recommendations. It is recommended that a full-time professional be appointed to coordinate and spear-head GSE activities. This person will report jointly to a designated enterprise or innovation director in each RDA and will be responsible for the development and oversight of tri-RDA initiatives. (estimated cost £90,000 per year, requesting 2 years funding at £180,000).

The total estimated cost of these proposed initiatives is £420,000 and is recommended that EEDA, LDA, and SEEDA jointly fund these activities at the amount of £70,000 per year each for two years.

1. Introduction

The three development agencies making up the United Kingdom's Greater Southeast (GSE) - EEDA, LDA, and SEEDA - are working with The Cambridge-MIT Institute's Programme on Regional Innovation (PRI) to assess the challenges and opportunities facing the GSE in its effort to maintain and consolidate leadership in knowledge-based economic growth and competitiveness and to deliver a consensus-based innovation strategy amongst the GSE's public and private sector leadership. This strategy will rely on inputs from the broad set of institutions that influence regional innovation and ongoing research by PRI on the structural dynamics of the GSE economy as it relates to the rest of the UK and to other leading capital city regions.

The GSE Innovation Initiative is designed to recommend both specific new programmatic and policy interventions, and new institutional mechanisms for GSE-level planning, policy, and partnership activity. This report is intended to present the underlying economic and policy rationale for this initiative. Central to this rationale is the role of the GSE as a driver whose success positively influences economic performance throughout the UK and the opportunity to be realized within the GSE and, as a by-product, the rest of the UK through a tri-RDA led initiative to strategically assess and influence the broad set of innovation stakeholders towards a partnership-based approach to knowledge-based competition and advancing innovation.

The Greater South East (GSE), which encompasses London, the South East and the East of England, is one of the major economies of Europe. While the GSE continues to be a leader both across Europe and world-wide in most measures of economic performance, it has also been recognized as facing unrealised economic opportunity in the underperformance of its innovation system (Arthur D. Little, 2003). Additionally, the GSE is facing increasing competition in the area of knowledge-based growth and competitiveness from a series of leading capital city regions which have undertaken high-level leadership initiatives to strategically coalesce local capabilities in advancing innovation. This report explores example initiatives in Tampere Finland, Boston Massachusetts, and Research Triangle North Carolina.

The efforts by EEDA, LDA, SEEDA, and PRI to assess the need and opportunities related to a GSE Innovation Initiative were informed by three elements, (1) a project steering committee to guide the effort and identify potential areas of strategic opportunity, (2) a series of research efforts to reveal relevant economic characteristics in the GSE and related areas, and (3) survey and workshop-based initiatives to understand stakeholder views.

Through this analysis and the insight drawn from steering committee and stakeholder dialogue, we have identified a series of recommendations outlined in this report. The areas targeted with recommendations include:

- Enhancing the demand side of knowledge transfer
- Technology roadmapping
- Internationalisation of the GSE
- Supporting the growth of medium sized firms
- Support for knowledge intensive business services (KIBS)

The remainder of this report is organised as follows: section 2 evaluates the common characteristics of the GSE economy; section 3 considers the importance of the GSE for the national economy and other regions of the UK; section 4 considers the impact of increased global competition which could threaten the long-term competitiveness of the GSE and hence the national economy; section 5 considers the need for a strategic response from the GSE; section 6 outlines some of the potential elements of a GSE strategy based on consultations with key stakeholders; and section 7 considers implementation activities and concludes.

2. Commonalities and Interdependencies Across the Regions of the GSE

Economic and Innovation Performance

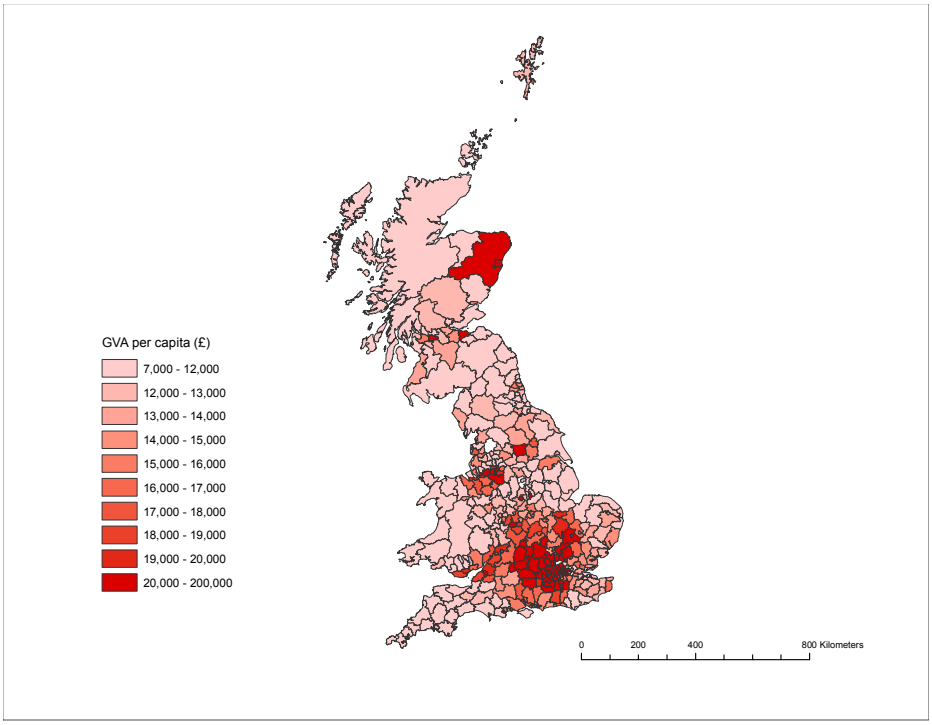
Although there are significant variations in the economic structure and performance measures across the UK regions, the GSE ones share a number of structural features and are ranked highly in various economic performance measures. Furthermore, the three GSE regions are among the most innovative in the UK, and form a highly integrated cluster of knowledge-intensive economic activity, world-class universities and a highly-skilled workforce, which extends across regional boundaries and represent a crucial driver for the overall UK performance.

One important economic feature that distinguishes the three regions from the rest of the UK is arguably the type and nature of industry clusters which have a bearing on potential agglomeration benefits. The clusters in the GSE are predominantly in the service/financial sector (mainly in London) and in knowledge intensive industries (for example biotechnology and pharmaceuticals in the Eastern Region, ICT in the Thames Valley and motor sports around Oxford) all of which appear to be deep clusters supported by thick skilled-labour markets and successful in job creation (DTI, 2001). It is probably no coincidence then that the most prosperous part of the UK encompasses parts of all three regions within the GSE: London, the Western part of the South East and the M11 corridor in the Eastern Region.

The GSE: an 'Optimal Policy Area'?

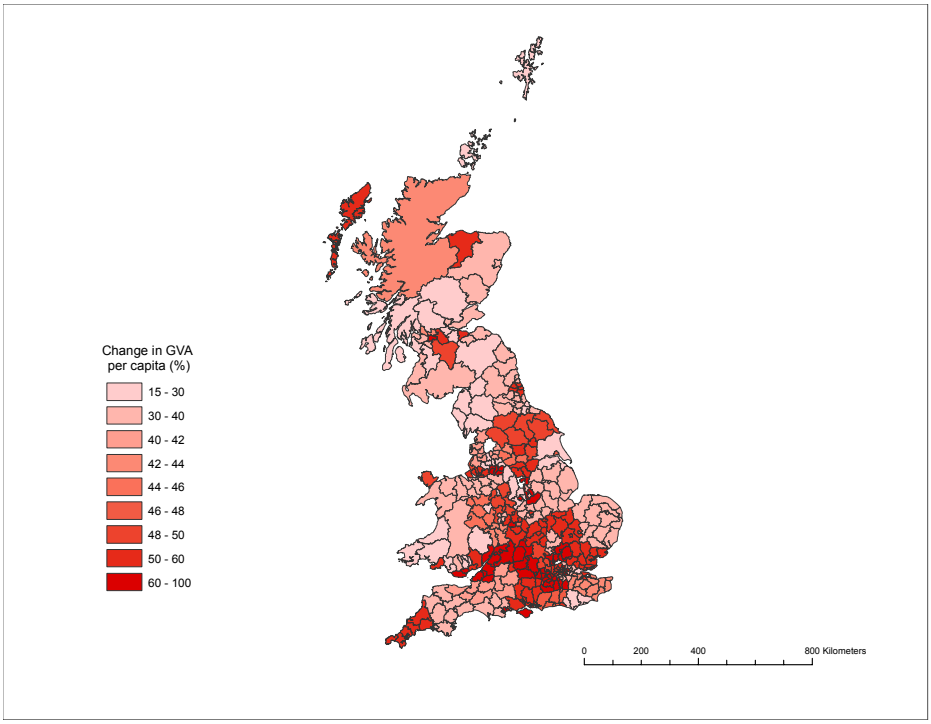
Currently, a major component of economic and industrial policy in the UK is being delivered by the Regional Development Agencies. Although this provides a much more localised delivery of policy than national initiatives, the geography of the policy largely reflects historic administrative boundaries rather than economic performance. Figures 1 and 2 show sub-regional economic performance in the UK based on gross value added per capita in 2003 and change in gross value added per capita in 2003 between 1995 and 2003. A number of observations can be made concerning the geography of economic performance. Firstly, the geography of economic performance does not easily map onto the standard regional structures. For instance there are similar levels of performance between London, the western part of the South East region and the western part of the Eastern region.

Figure 1: GVA per Capita, 2003



Source: Local Knowledge (2006).

Figure 2: Change in GVA per Capita, 1995-2003



Source: Local Knowledge (2006).

Secondly in term of economic performance levels, the GSE arc is a central dynamo of economic activity. There are smaller areas of high performance around Manchester and Leeds, and oil driven economic activity in the north of Scotland. It should also be noted that there are also some areas of low economic activity in the GSE around the western parts of both the South East and the Eastern regions. Thirdly, in terms of the growth of economic activity, the GSE is the key engine of growth. This suggest the importance of strong endogenous growth processes where the success of the GSE is generating further growth, and such a virtuous cycle is raising national prosperity.

The common economic performance across much of the GSE and its complementary economic structures suggest that the GSE may constitute an optimal policy area. That is the similarities in term of economic performance and responses to shocks indicate that policy should be coordinated so that both regional and national economic performances are maximised.

The Drivers of Competitiveness

Further analysis of similarities across the GSE can be analysed by considering those factors that contribute to economic performance. The five key drivers of regional competitiveness have been identified by UK government, they are: skills, enterprise, innovation, competition and investment (H. M. Treasury, 2001, 2004).

- Skills levels - improve the operation of the labour market and creates a flexible workforce capable of implementing new technologies and processes

- Enterprise - which can encourage new firm formation and the management of change by managers

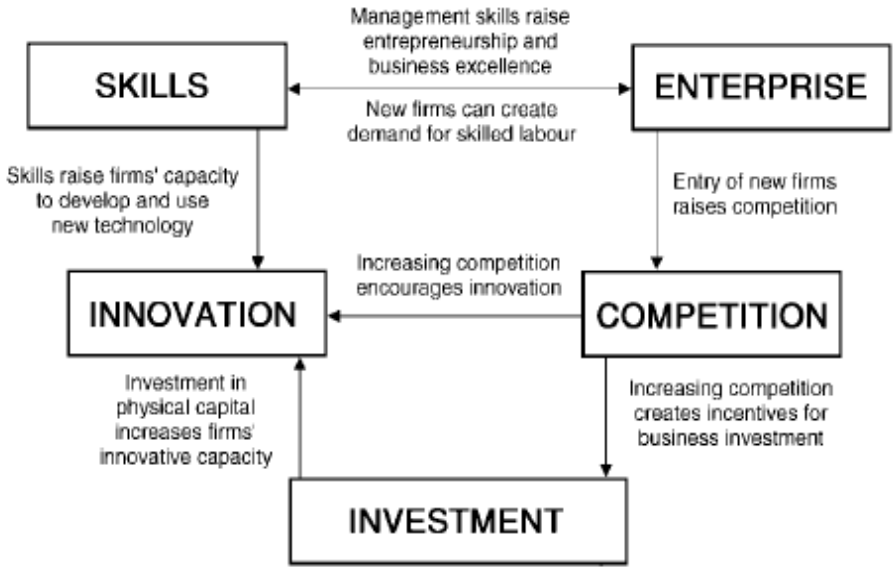
- Innovation - generates new ideas, improves the stock of knowledge and leads to improved products and processes

- Competition - creates incentives for innovation, and better management and organisation structures

- Investment - which can provide workers with more or better equipment to use in production and can facilitate the implementation of new innovations

As shown in Figure 3, the drivers are interdependent, since contribution of each depends upon the support of the others.

Figure 3: Drivers of regional productivity used in UK regional competitiveness policy.



Source: H. M. Treasury (2004).

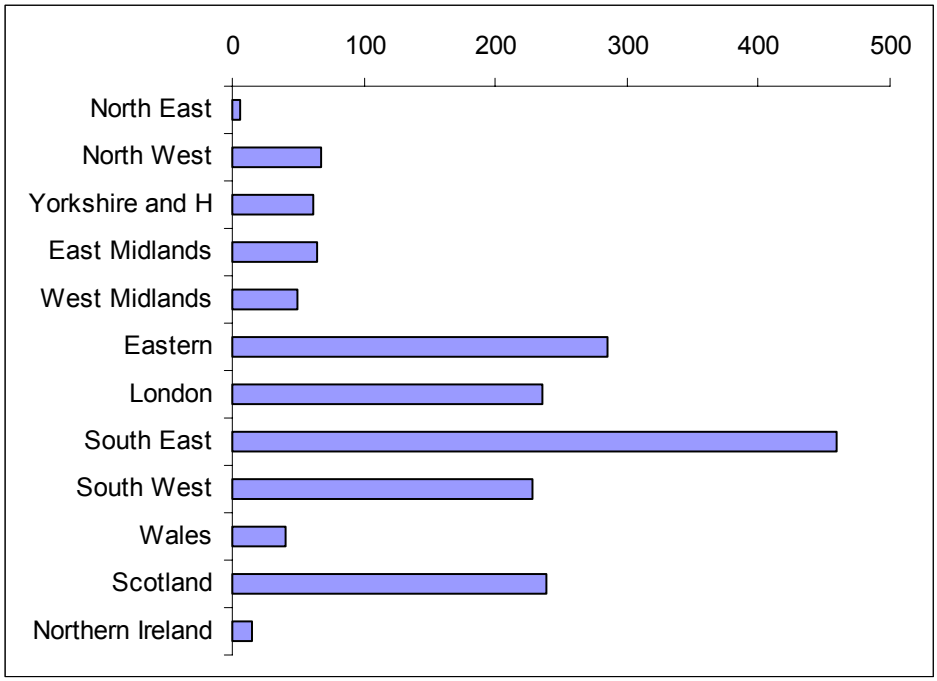
Table 1 shows the regional ranking based on a number of indicators of the 5 drivers. In general the regions of the GSE are highly ranked in terms of the drivers with London, in particular being highly placed. In terms of enterprise the three regions rank first, second and third – and overall London is ranked first for three of the five drivers. The one apparent anomaly in the mid table ranking of the London in term of innovation – but this is largely a statistical artefact as the metric used – based on R&D expenditure – fails to adequately capture the innovation activity in services, which is important for the London economy. If an alternative indicator of innovation – the share of high technology jobs in total employment – London joins South East and the Eastern Region in the top amongst the most innovative regions. A similar picture emerges if we consider the level of government expenditure on R&D (see Figure 4). Additionally, in terms of business expenditure, South East and the Eastern Region maintain their leading positions (see Figure 5). **Overall, to the extent that five drivers are driving the UK economy, then the regions of the GSE are driving the fastest.**

Table 1: The Five Drivers: Regional Rankings

Region	Enterprise (Business Start-up Rate 2003)	Competition (No. of Serious Competitors)	Skills (% of Working Pop. with NVQ4+, 2002-2003)	Innovation (R&D Exp. As % of GDP, 2002)	Investment (Average Annual Growth Rate, 1995-2003
London	**1**	**1**	**1**	**6**	**3**
South East	**2**	**5**	**3**	**2**	**1**
Eastern	**3**	**4**	**5**	**1**	**6**
South West	4	7	4	4	4
East Midlands	5	2	10	3	7
West Midlands	6	3	9	7	9
North West	7	8	7	5	12
Yorkshire	8	6	8	10	10
Scotland	9	9	2	8	5
N. Ireland	10	No data	No data	9	2
Wales	11	11	6	11	11
North East	12	10	11	12	8

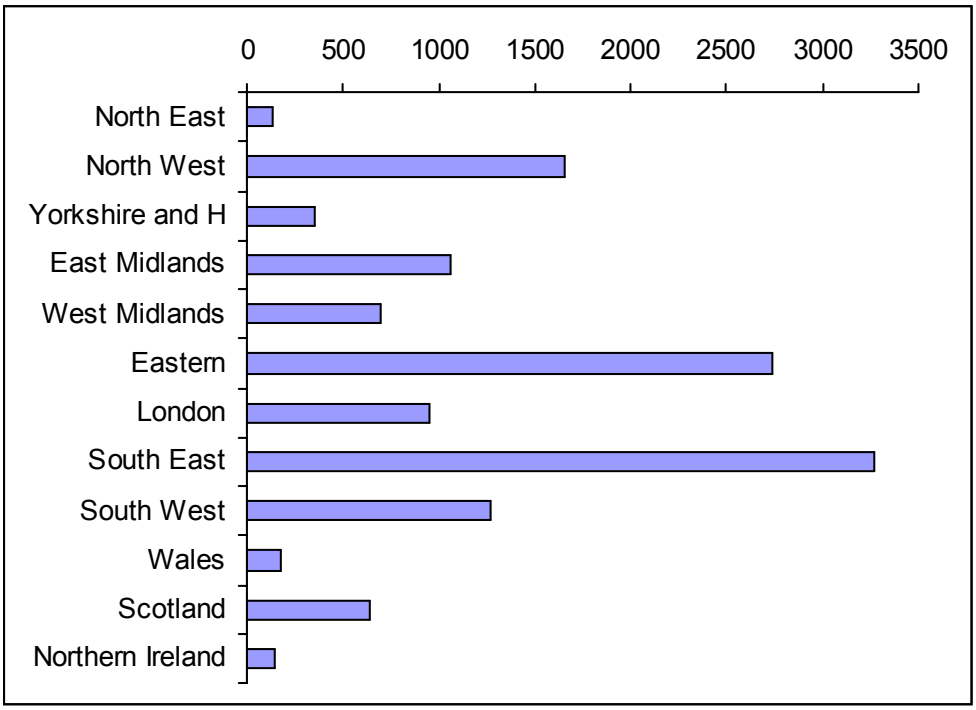
Sources: Cols 1 and 3-5: Martin (2005). Col 2: Kitson (2006).

Figure 4: Government Expenditure on R&D in 2002, £ million



Source: Owens (2004), *Economic Trends.*

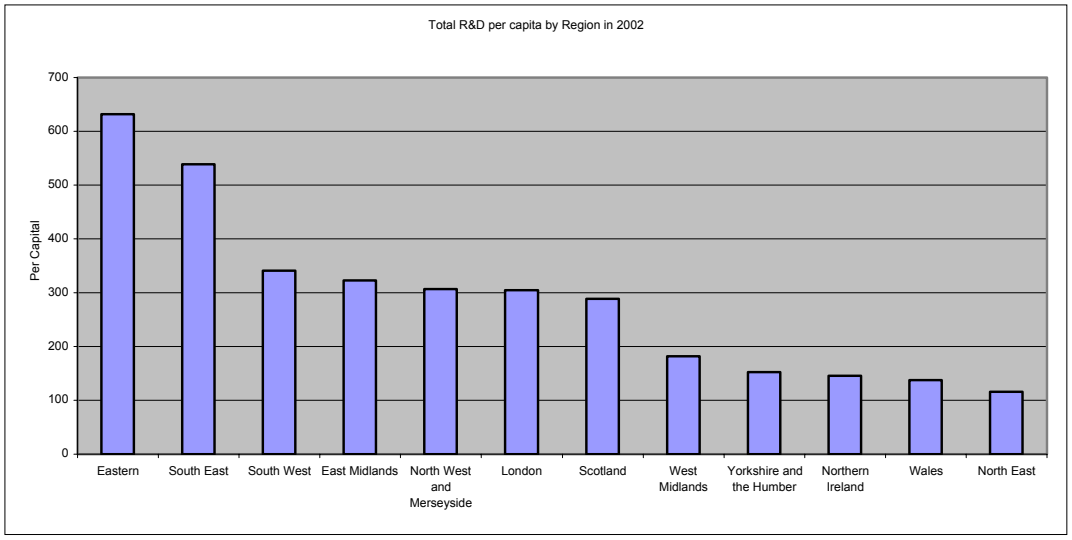
Figure 5: Business Expenditure on R&D in 2002, £ million



Source: Owens (2004), *Economic Trends*.

The overall picture for R&D normalised for population is shown in Figure 6. The intensity of innovation based on the metric is highest in the South East and Eastern regions. London is mid-ranking, but note the caveat above and that this does not affect the London performance in terms of labour productivity.

Figure 6: Total R&D per capita in the UK Regions (2002)



Source: DTI (2005). *Regional Innovation Patterns. Summary Note*.

This evidence raises the issue as to whether the GSE might be considered as a Regional Innovation System, along the lines of the recent literature on innovation

systems at the sub-national scale (Lundvall, 1992; Edquist, 1997; Cooke, 2001; Carlsson, 2004; Doloreux and Parto, 2004). A lively debate exists on the extent to which regional differences in economic performance across UK can be explained by large differences in regional innovation performance. However, the characteristics of the GSE regions in terms of sectoral specialisation should also be taken into account. As mentioned above, the Greater South East has the highest concentration of knowledge-intensive business services (KIBS), not only with respect to the rest of the country, but also compared to the rest of the European Union. The observed 'regional innovation map' in the UK might therefore essentially be due to differences in the regional sectoral structure, making it a sectoral system of innovation (Metcalfe and Miles, 2000). Indeed, KIBS typically rely on non-R&D innovation investments and have high employment and productivity returns (Cainelli et al. 2006). This would help explain the innovation and economic performance figures of the London region within the GSE and the characteristics of the GSE as a regional innovation system within the UK.

The GSE as a 'Talent Magnet'

The GSE is home to world-class universities which are the backbone of a knowledge economy. Table 2 shows the distribution of research-intensive Universities across regions according to the latest research assessment exercise (RAE 2001). The important role of London is evident, not only in terms of number, but also in terms of quality of knowledge (5 and 5* departments). The South East is ranked second and the Eastern region is mid table.

Table 2: Location of Research-Intensive Universities (% of Total Departments, based on RAE 2001)

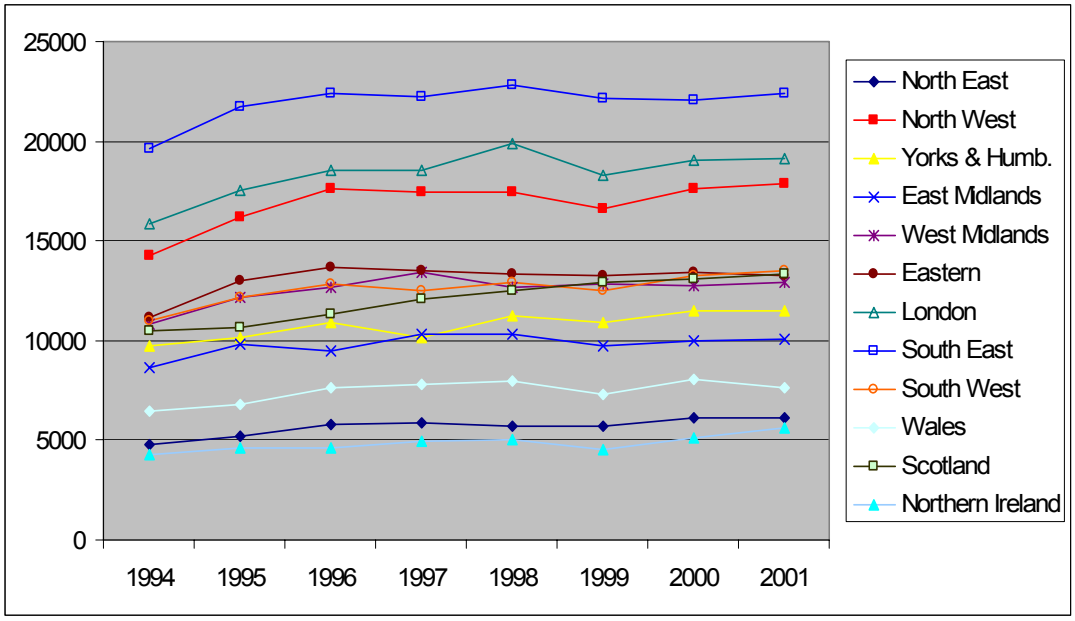
Region	Ranking	
	5 and 5*	1 to 4
London	18	17
South East	15	12
Scotland	12	14
Yorkshire and Humberside	10	8
North West	9	10
West Midlands	7	8
South West	7	8
Eastern	7	4
East Midlands	5	8
Wales	5	6
North East	5	5
UNITED KINGDOM	100	100

Source: RAE (2001).

In addition to research activity, Universities provide human capital which improves the stock of skills, one of the important drivers of competitiveness. According to Faggian and McCann (2006), the major regional factor encouraging graduates to seek for jobs in a region are (i) the innovative potential of a region; (ii) the proportion of knowledge workers in a region. A strong cumulative process of knowledge concentration occurs therefore, which typically characterises the GSE and London in

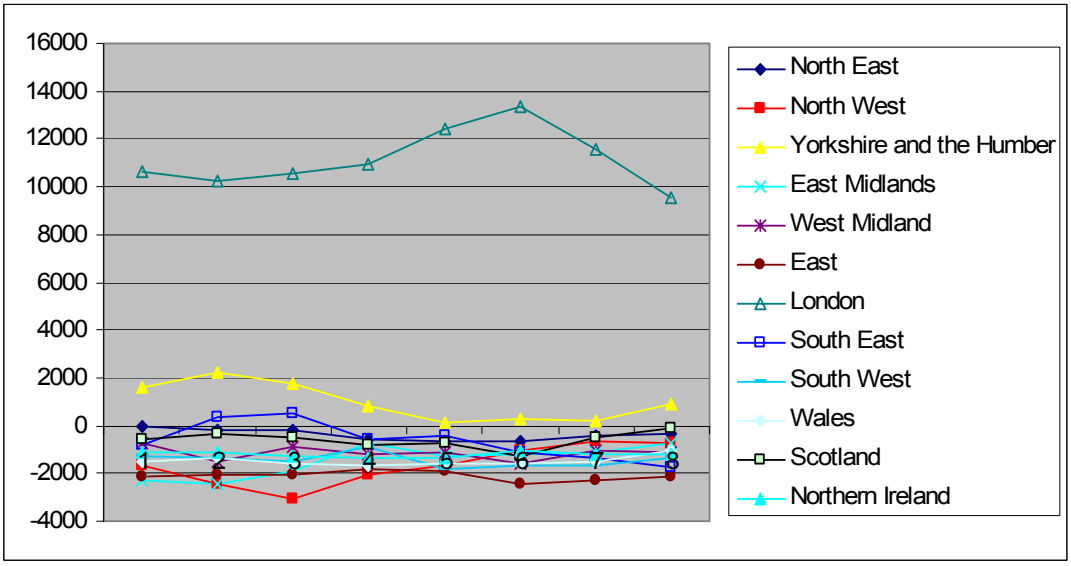
particular. They act, and particularly London, as a 'talent magnet' for graduates (Wales, 2006), as shown in the graphs below.

Figure 7: Knowledge Flows – Regional Graduate Turn-out (1994-2001)



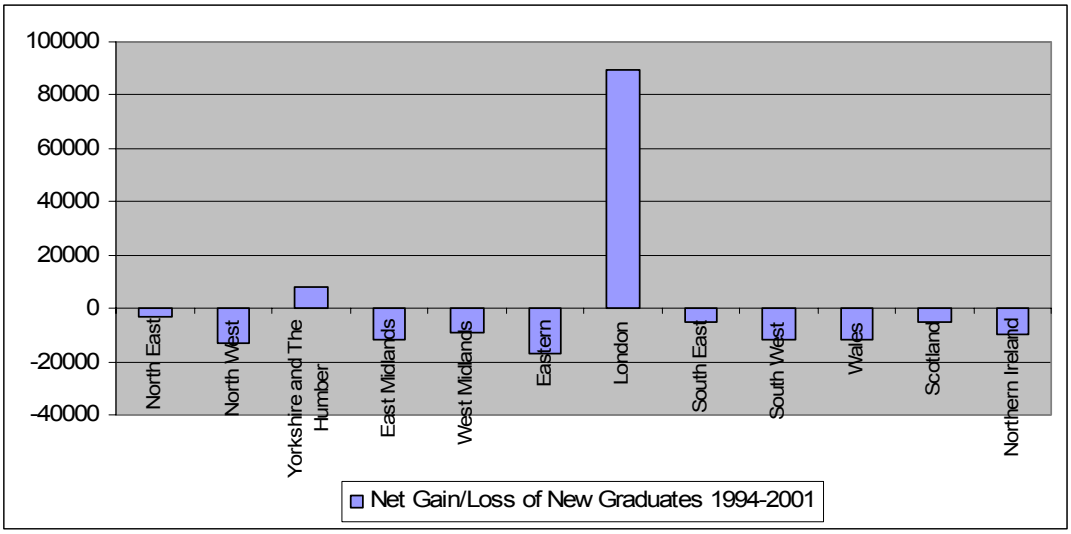
Source: HESA, Higher Education Statistics Agency (2005). *Final Destination Survey.*

Figure 8: Knowledge Flows – Annual Net Gain/Loss (1994-2001)



Source: HESA, Higher Education Statistics Agency (2005). *Final Destination Survey.*

Figure 9: Knowledge Flows – Net Gain/Loss of New-Graduates (1994-2001)



Source: HESA, Higher Education Statistics Agency (2005). *Final Destination Survey.*

Over the period 1994-2001 the net 'knowledge' gain for London has been strikingly higher than for the rest of UK.

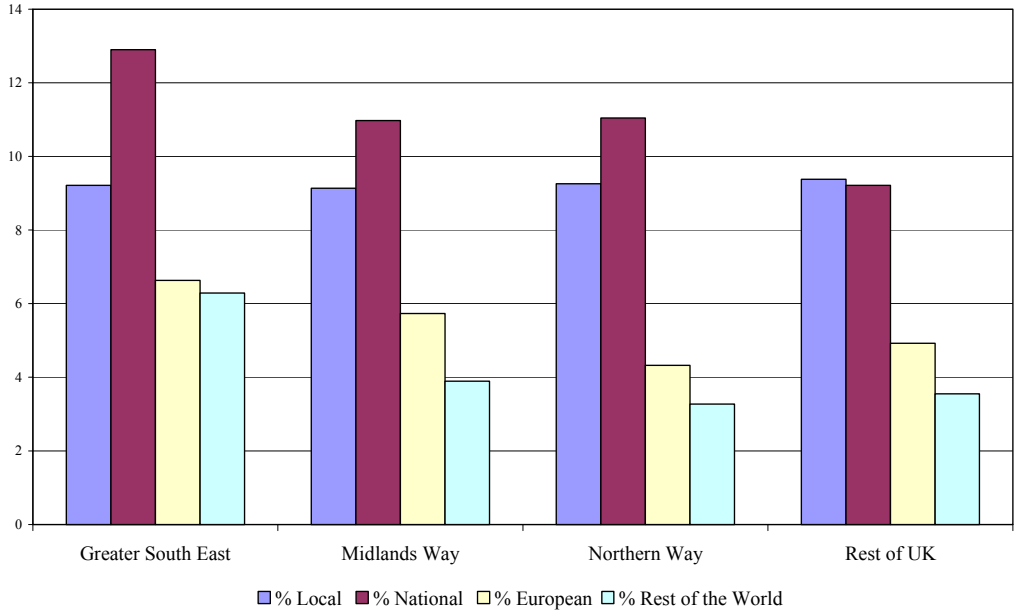
GSE as a Network Economy

The GSE regions are also characterised by a higher degree of connectivity both at the regional/national level and across Europe and the rest of the world. Figure 10 reports the percentage of innovative firms which have established co-operation partnerships respectively within their region, at the national level, with European partners and with partners located in countries others than EU, by RDAs.

The empirical evidence is based on the latest Community Innovation Survey firm-level data (2006). The ability to establish (and attract) co-operative partnerships to innovate is clearly much higher in the GSE regions than in the rest of the UK meta-regions. GSE firms tend to cross the UK borders on average more than the rest of UK, contributing to the international competitiveness of the whole country. Furthermore, and more importantly, they tend to establish innovation network at the national level more frequently than their counterparts in other regions. Almost 13% of innovative have established innovative networks with other firms located in UK.

The GSE as a network central node is of crucial importance for the rest of the country, as it represents a vehicle of knowledge and innovation spillovers beneficial to the whole UK.

Figure 10: Percentage of Innovative Firms Co-operating with Partners Located Within the Region, UK, Europe and Other Countries, by RDA (2004)



Source: UK Community Innovation Survey 2004 (DTI, 2006).

Knowledge Exchange and Exploiting the Science Base

It is often argued that there are barriers hampering effective dissemination of new technologies and knowledge of best-practice from one area to another, and that dissemination decreases with distance due to a variety of market failures.[1] This suggests that there is a potential strategic added value of Tri-RDA coordination to transfer good practice, and to develop and use benchmarks.

Enhancing the links between industry and the GSE universities should also be regarded as being of paramount importance. A particular rationale for collaboration among the regions of the GSE in this connection is to ensure that research specialisation in one place complements rather than crowds out those of another.

Commonality in the geography of the three regions also suggests a potential for a mutually beneficial GSE-wide effort to improving their common gateway. Maximizing the potential of the Thames Gateway is a case in point. Common geography that hosts world-class universities and similar economic structures would also suggest mutually beneficial effort of enhancing the international profile of the GSE.

[1] A summary of the relevant literature is presented in HM Treasury (2001).

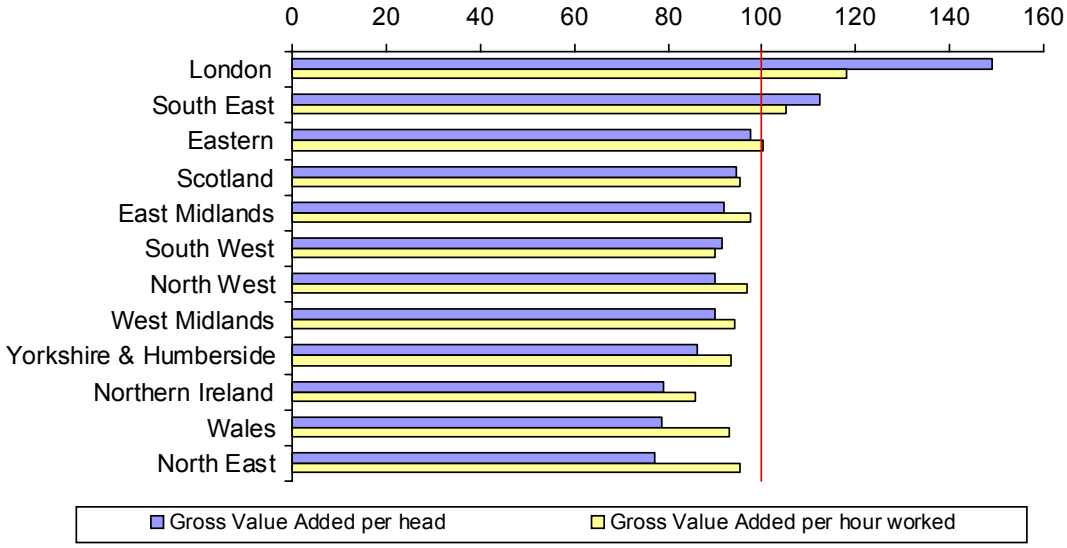
3. GSE as a Critical Asset for Overall UK Economic Performance

> *Within the UK the GSE's position is distinctive in terms both of the quality and variety of its economic assets and its cost structure. Its relationship with the other UK regions is both competitive and complementary, in that there are roles for which it has strong economic advantages over the rest of the country, but also many where there are overlaps.*
> Gordon (2004) p. 42

The GSE as an Engine of Growth in the UK

The empirical evidence on the economic performance of the GSE shows that productivity figures (both in terms of GVA per head and per hour worked) in the GSE regions are higher than the UK. The 'productivity gap' between the best performing region (London) and the worst one (N. Ireland) is almost 40%, confirming that GSE represents the main driver of UK economic performance.

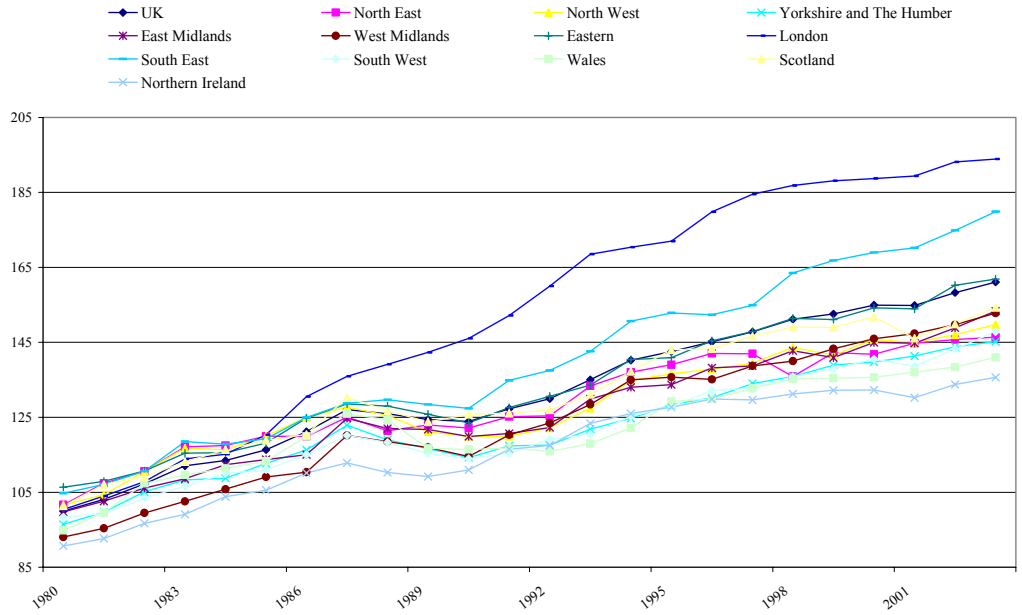
Figure 11 GSE regions rank at the top in terms of regional productivity



Source: DTI (2004), *Regional Competitiveness Indicators.*

Figure 12, which shows the path of labour productivity since 1980, reveals two important trends. First, labour productivity has been accelerating in the GSE led by London. Second, there has been a widening dispersion of regional productivity performance during the period. It is important to note however that productivity performance is not zero-sum game – that is productivity growth in one region does not hamper productivity performance in another region. In fact the opposite is likely to happen as fast productivity growth in one region is likely to raise national growth and the performance of other regions.

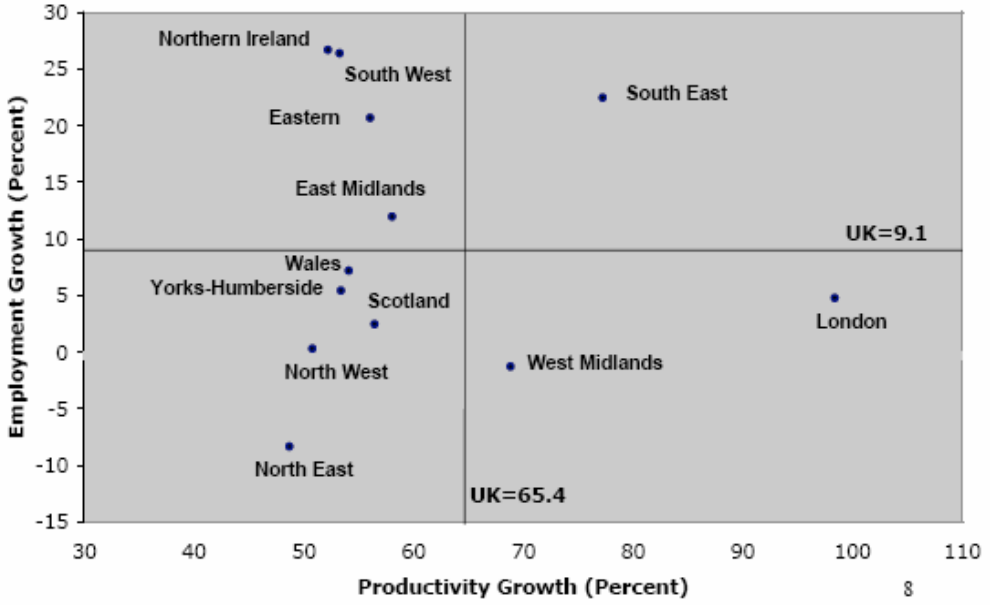
Figure 12: Regional Growth of Labour Productivity, 1980-2004



Source: Cambridge Econometrics (2005). *GVA and Employment 1980-2004.*

Looking at both the regional growth of productivity and employment over the period 1980-2004, it clearly emerges that the position of South East and Eastern, particularly as far as employment growth is concerned, and of London in terms of productivity growth, makes the GSE a real driver of the overall UK economic performance.

Figure 13: Regional Productivity and Employment Growth, 1980-2004



Source: Martin (2005), p.15

The GSE: an Ideas Generating Region

As discussed above the GSE has a high level of innovation and attracts highly skilled labour and as the 'ideas generating' region it generates more than 52% of national patenting activity. As argued by Fujita and Thisse (2003), such innovative activity can have significant beneficial effects for other regions as ideas generated in one region are diffused and dispersed and incorporated into products and processes elsewhere. And these beneficial effects can be significant for other regions – for instance the wholesaling, retail and financial sectors drove the productivity surge in the USA from 1995. These are not normally classified as high technology activities but there are sectors that were successful in using new technologies such as ICT. Similarly a distinction can be made between *knowledge generating* locations and *knowledge using* locations. The former depend on high levels of innovation activity in the R&D sector involving knowledge externalities among skilled workers. The success of such locations depends on exploiting the benefits of agglomeration and the use of networks and policy coordination. The latter depends on having systems that enable traditional sectors to incorporate technological advances and upgrade their products and processes.

The danger for regional policy is when all regions attempt to become knowledge generating locations as this can lead to a loss of the benefit of scale – the agglomeration effect – and subsequently lower the growth of all regions.

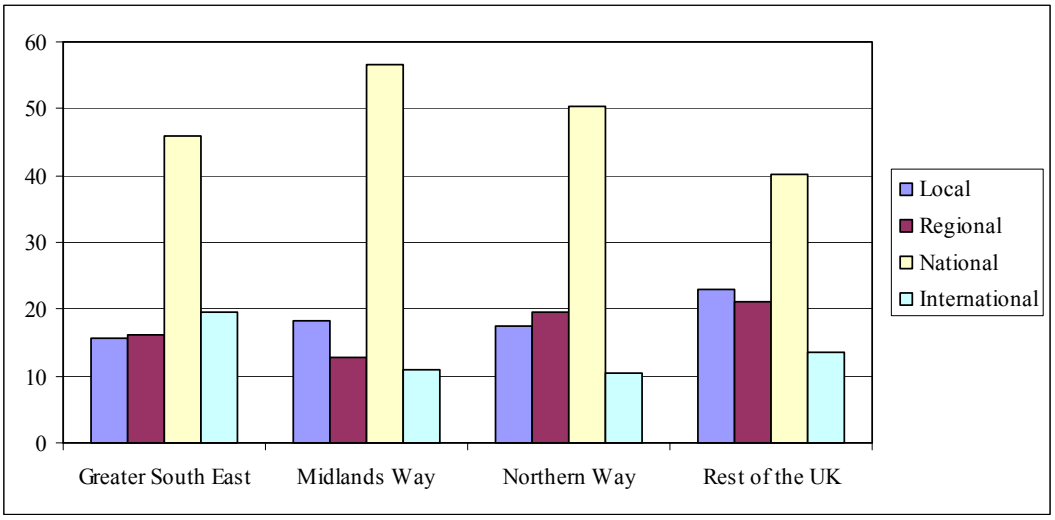
The GSE: an Important Market for UK Business

The GSE is an important market for businesses throughout the UK, it accounts for almost half the total UK market, as illustrated by Figure 14. The nature of the UK economy is such that most firms rank the national market as the most important market for their product or service, over 50% of firms in the Midlands Way and Northern Way areas consider the national market their most important market, as shown on Figure 15. The GSE is therefore a key driver of UK economic growth through a demand-pull effect on the other UK regions.

Figure 14: Relative Size of the UK Regional Markets (% of UK GVA, 2003)

Source: Local Knowledge (2006) and NOS.

Figure 15: Largest Market for Firms in the UK regions (2004)



Source: SME Survey 2004, CBR (2004).

The GSE: the Revenue Generating Region

The economic success of the GSE has a significant beneficial impact on UK fiscal policy and the resources that can be redistributed to other regions. According to Gordon et al. (2004), the GSE region made a net fiscal transfer of some £30 billion to the rest of the country in 2003. This reflects paying more taxes than proportionate to population and receiving less government expenditure relative to the population. For example as shown in Table 3, the three regions of the GSE all paid a greater share of national taxes compared to their shares of population or economic activity (GVA).

Table 3: Economic Statistics by Region, 1999 and 2001 (GVA): % of UK Total

Region	GVA	Household Income	Taxes Paid	Social Contributions	Consumption Spending	Population
North East	3.3	3.7	3.0	3.6	3.5	4.4
North West	10.3	10.5	9.5	10.4	10.9	11.6
Yorkhire	7.3	7.5	6.8	7.6	7.7	8.5
East Midlands	6.5	6.5	6.3	6.7	6.5	7.0
West Midlands	8.1	8.3	7.6	8.6	8.4	9.0
Eastern	10.1	9.7	10.5	9.9	9.3	9.1
London	16.5	15.4	17.5	15.7	15.2	12.1
South East	16.3	15.5	18.4	14.9	15.7	13.5
South West	7.5	8.1	7.8	7.5	8.1	8.3
Wales	3.9	4.1	3.3	3.9	4.1	5.0
Scotland	8.1	8.2	7.6	8.9	8.3	8.6
N. Ireland	2.2	2.3	1.7	2.2	2.4	2.9

Source: Gordon et al. (2004).

The GSE: the Internationally Orientated Economy

The GSE shows also the highest degree of international orientation compared to the rest of UK. This indicates that maintaining the global competitiveness of GSE is of paramount importance for the overall UK economy. The proportion of exporting companies and the amount of regional export per head of population within a region are a measure of the international competitive advantage of a region. The figures reported in the UK competitiveness index show that South East, Eastern and London are among the top 5 regions in terms of share of exporting companies and amount of exports and imports per head of population (see Tables 4-6).

Table 4: Regional Proportion of Exporting Companies (2001-2003)

Rank	Region	Exporting Companies (2003)	Exporting Companies (2001)	Rank in 2001	Change in Rank
1	West Midlands	3.2%	3.0%	2	1
2	London	3.2%	3.0%	1	-1
3	East Midlands	3.1%	2.9%	3	0
4	South East	3.0%	2.9%	4	0
5	Eastern	2.9%	2.7%	5	0
6	Yorkshire and The Humber	2.8%	2.6%	6	0
7	North West	2.7%	2.5%	7	0
8	North East	2.2%	2.1%	8	0
9	South West	2.1%	1.8%	9	0
10	Scotland	1.9%	1.8%	10	0
11	Northern Ireland	1.9%	1.7%	11	0
12	Wales	1.6%	1.5%	12	0
	United Kingdom	2.7%	2.5%		

Source: UK Competitiveness Index (2005), Robert Huggins Associates.

Table 5: Regional Exports per Head of Population (1997-2003)

Rank	Region	Exports per Head (2003)	Exports per Head (1997)	Rank in 1997	Change in Rank
1	South East	£3.56	£2.97	3	2
2	East Midlands	£3.33	£2.40	5	3
3	Eastern	£3.23	£2.25	6	3
4	London	£3.16	£3.00	2	-2
5	North East	£3.16	£2.18	8	3
6	Scotland	£2.60	£3.03	1	-5
7	West Midlands	£2.51	£2.59	4	-3
8	North West	£2.50	£2.20	7	-1
9	Wales	£2.44	£1.99	9	0
10	Northern Ireland	£2.38	£1.47	11	1
11	Yorkshire and The Humber	£1.86	£1.65	10	-1
12	South West	£1.82	£1.32	12	0
	United Kingdom	£2.77	£2.38		

Source: UK Competitiveness Index (2005), Robert Huggins Associates.

Table 6: Regional Imports per Head of Population (1997-2003)

Rank	Region	Imports per Head (2003)	Imports per Head (1997)	Rank in 1997	Change in Rank
1	South East	£6.76	£5.10	2	1
2	Eastern	£6.13	£3.74	3	1
3	London	£5.11	£5.55	1	-2
4	West Midlands	£3.11	£2.35	4	0
5	East Midlands	£2.96	£2.23	5	0
6	North West	£2.43	£1.77	7	1
7	Yorkshire and The Humber	£2.24	£1.67	8	1
8	Northern Ireland	£2.20	£1.52	9	1
9	North East	£2.12	£1.46	11	2
10	South West	£2.11	£1.48	10	0
11	Wales	£1.88	£1.25	12	1
12	Scotland	£1.63	£2.13	6	-6
	United Kingdom	£3.63	£2.89		

Source: UK Competitiveness Index (2005), Robert Huggins Associates.

4. Increased Competition from Other EU and World Regions

GSE's relative international standing: not very enviable

With the increased internationalisation and integration of the world economy the GSE is unavoidably engaged in a global competition in terms of generating and attracting high growth, profitable and innovative firms. Growth rates in the national economies of countries such as China (9.3%), South Korea (5.1%) and the rest of Asia (4.4%) are likely to be much higher than for the UK as a whole (2.8%) in 2007 and beyond (see, for e.g., Cooper, 2005). In the UK only the regions in the GSE have track records of leading the national growth rate and their continued success is vital for the economic performance of the national economy.

The new challenges of globalisation and harsher international competition put the GSE comparative advantage increasingly at risk, if no action is taken to prepare for intensified global competition. Recent comparisons on competitiveness performance shows that GSE regions are ranked respectively 8th (London), 12th (South East) and 17th (Eastern) and represent, together with South West (32nd), the only four UK regions above the average of 91 regions across Europe in terms of the European Competitiveness Index (see Table 7). This latter consists of a composite index of competitiveness, based on various indicators, along which R&D intensity, GDP per capita, infrastructure and accessibility (Huggins and Day, 2005).

Table7: Regional European Competitiveness Index 2004 (European Average =100)

Rank	Region	Index	Rank	Region	Index
1	Uusimaa, Finland	261.8	47	Sud-Ouest, France	91.0
2	Stockholm, Sweden	252.3	48	Schleswig-Holstein, Germany	89.8
3	Brussels, Belgium	248.1	49	Mellersta Norrland, Sweden	89.4
4	Île de France, France	230.0	50	Noord-Nederland, Netherlands	87.9
5	Switzerland	224.7	51	Est, France	87.1
6	Luxembourg	222.0	52	Südösterreich, Austria	86.4
7	Hamburg, Germany	211.5	53	Méditerranée, France	86.2
8	**London, UK**	**186.4**	54	Väli-Suomi, Finland	83.8
9	Norway	184.6	55	Nord Est, Italy	83.4
10	Bremen, Germany	178.9	56	Norra Mellansverige, Sweden	83.2
11	Baden-Württemberg, Germany	175.9	57	Bassin Parisien, France	80.6
12	**South East, UK**	**171.7**	58	Småland med öarna, Sweden	79.9
13	Hessen, Germany	170.7	59	Sachsen, Germany	79.0
14	West-Nederland, Netherlands	168.2	**60**	**Yorkshire and The Humber, UK**	**77.5**
15	Bayern, Germany	160.1	61	Centro, Italy	77.1
16	Berlin, Germany	154.9	62	Ouest, France	71.9
17	**Eastern, UK**	**152.7**	**63**	**Northern Ireland, UK**	**67.3**
18	Denmark	142.6	**64**	**Wales, UK**	**63.6**
19	Västsverige, Sweden	135.6	65	Itä-Suomi, Finland	63.0
20	Zuid-Nederland, Netherlands	135.0	66	Brandenburg, Germany	62.8
21	Ostösterreich, Austria	131.8	67	Nord - Pas-de-Calais, France	62.5
22	Östra Mellansverige, Sweden	128.2	68	Thüringen, Germany	61.9
23	Pohjois-Suomi, Finland	127.5	**69**	**North East, UK**	**59.9**
24	Sydsverige, Sweden	127.1	70	Este, Spain	59.6
25	Lazio, Italy	124.0	71	Noreste, Spain	56.4
26	Nordrhein-Westfalen, Germany	123.6	72	Région Wallonne, Belgium	55.3
27	Åland, Finland	120.6	73	Sachsen-Anhalt, Germany	52.1
28	Etelä-Suomi, Finland	117.7	74	Border, Midlands and Western, Irelan	50.1
29	Oost-Nederland, Netherlands	116.1	75	Mecklenburg-Vorpommern, Germany	49.1
30	Comunidad de Madrid, Spain	115.8	76	Abruzzo-Molise, Italy	48.8
31	Centre-Est, France	114.1	77	Portugal (Continent)	40.6
32	**South West, UK**	**112.5**	78	Attiki, Greece	38.9
33	Rheinland-Pfalz, Germany	109.7	79	Canarias, Spain	38.4
34	Lombardia, Italy	109.3	80	Sardegna, Italy	26.3
35	Övre Norrland, Sweden	107.2	81	Nisia Aigaiou, Kriti, Greece	22.4
36	Southern and Eastern, Ireland	103.0	82	Madeira, Portugal	22.1
37	Emilia-Romagna, Italy	102.5	83	Açores, Portugal	21.9
38	Saarland, Germany	101.1	84	Campania, Italy	19.5
39	Niedersachsen, Germany	100.7	85	Noroeste, Spain	18.5
40	**West Midlands, UK**	**98.8**	86	Sicilia, Italy	15.6
41	Vlaams Gewest, Belgium	98.8	87	Sud, Italy	13.9
42	**Scotland, UK**	**98.7**	88	Centro, Spain	13.6
43	**East Midlands, UK**	**98.4**	89	Voreia Ellada, Greece	11.5
44	Westösterreich, Austria	97.6	90	Sur, Spain	7.3
45	Nord Ovest, Italy	95.9	91	Kentriki Ellada, Greece	2.4
46	**North West, UK**	**92.0**			

Source: UK Competitiveness Index (2004), Robert Huggins Associates.

The nature of the challenge and the need for strengthening knowledge based economy
The dynamic challenges facing the GSE are best understood within a theoretical framework of evolutionary economics. Modern economic analysis argues that

regions are confronted with a number of important external sources of change over which they have little or no control. These include changes in markets and the competitive environment, changes in technology, changes in policy regimes and major economic and cyclical shocks. In order to maintain or enhance their dynamic competitive advantage in the face of these external forces of change regions must embrace new economic, technological and institutional forms. To the extent that they are able to do this then their adaptive and innovative capacities can be strong and effective enough to meet the international challenges with which they are confronted.

The central plank in western national and regional economic responses to these challenges is to focus on activities that do not compete directly with Asian type economies on the basis of labour costs. Instead the focus is on the development of knowledge based economies. Arguably what is required in this instance are:

- An economic and institutional regime that provides incentives for the efficient use of existing knowledge, the creation of knowledge and entrepreneurship.
- An educated and skilled population that can create and use knowledge.
- A dynamic information structure that can facilitate the effective communication, dissemination and processing of information.
- A system of research centres, universities, think tanks, consultants, firms and other organisations that can tap into the growing stock of global knowledge, assimilate and adapt it to local needs and create new knowledge.

GSE as a knowledge based economy: international comparisons
Economic analysis in the style of modern growth theory provides a systematic way of understanding the nature, requirements and development of knowledge based economies. Simply put, the basic tenet of modern growth theory is that innovation, and hence growth is governed by economics, i.e. innovation is typically dearly bought and profit-driven. The theory stresses the need to invest in human capital particularly in terms of education, skills and training. It also points to the need to develop innovative milieux (or 'eco-systems') characterised by purposive R&D, innovation and its diffusion through the local production structure. We use this theoretical framework for comparing the GSE knowledge economy performance with other high performing regions in the global economy.

Firstly, in terms of investment in human capital as indicated by public expenditure per capita on higher education the GSE regions feature in the world top 40 regions. Nevertheless, many regions in North America, Europe and the Far East spend more on this important ingredient of a knowledge based economy. The top four regions are all in the USA. In Europe they are followed by such capital city regions as Brussels, Vienna, Berlin, Stockholm, Ile de France (Paris) and Amsterdam. Despite this the GSE performs well in Europe in terms of the proportion of its workforce that is educated to tertiary level at the moment. In this case it has been second only to Brussels in recent years. Nevertheless, there are some questions over the real quality of this education level as compared with some other nations.

Secondly, turning to the innovative milieu in the GSE, the South East and Eastern regions have performed around the average in the world's top regions with respect to investment in both business and government R&D. London, on the other hand, as is

to be expected in a mainly service based economy has spent, in the past, less than average on both kinds of R&D.

Overall, during the late 1990s, the GSE performed better than the European average with respect to business and at about the average for public investment in R&D. Nevertheless, in comparison with other European capital city regions it has consistently lagged behind the Ile de France. In terms of business expenditure on R&D it has also lagged behind Baden-Wurttemberg and Bayern in Germany.

Thirdly, in comparison with the global high-performing region means the GSE has in the past registered below average numbers of patents which is a measure of innovation output. Most of the top regions in this case are in the USA. These include such iconic regions as San Francisco and Boston. There have been, however, a number of regions in Europe, notably in Germany (Baden-Wurttemberg, Bayern) Sweden (Stockholm) and Finland (Uusimaa), that have characteristically registered more patents than the global mean and significantly more than the GSE. With respect to the acquisition of European patents regions in Germany, Finland, Austria, Belgium and France have done better in recent years than the GSE. As can be seen in Table 8 while the GSE regions belong to the top 20 in terms of European patent applications, they are nonetheless outperformed by quite a few regions in Europe.

Table 8: Regional variations in European Patent applications, 2003

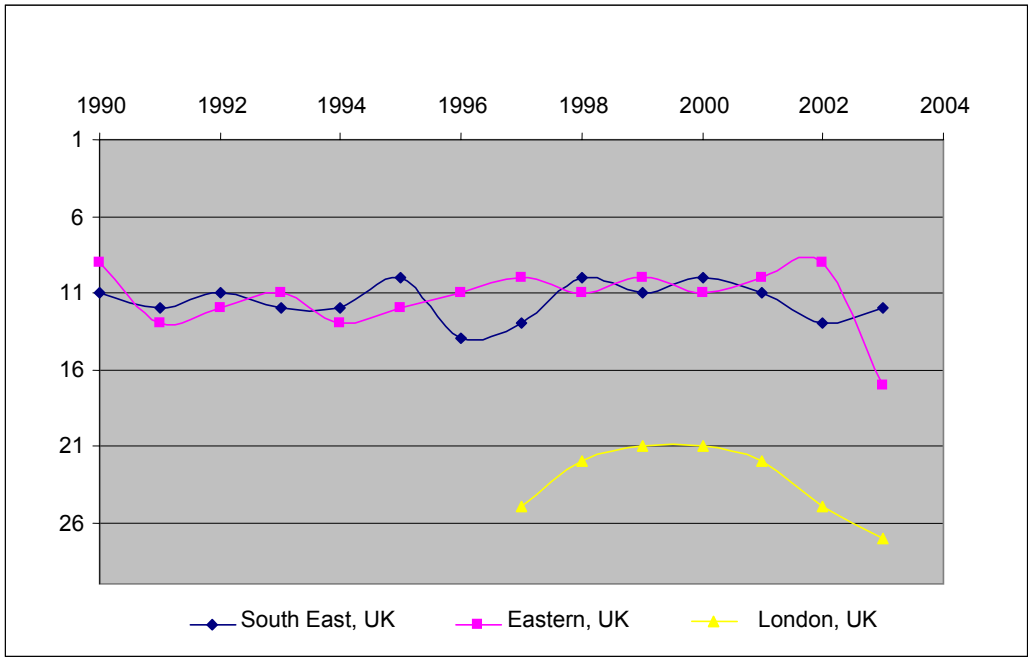
Top 20 Territories	Patent applications per million inhabitants
Baden-Württemberg, Germany	314
Zuid-Nederland, Netherlands	289
Bayern, Germany	233
Hessen, Germany	161
Île de France, France	158
Rheinland-Pfalz, Germany	148
Nordrhein-Westfalen, Germany	147
Manner-Suomi, Finland	143
Sverige, Sweden	137
Hamburg, Germany	118
Luxembourg (Grand-Duché), Luxemburg	117
South East, UK	115
Westösterreich, Austria	114
Centre-Est, France	112
Berlin, Germany	107
Niedersachsen, Germany	106
Eastern, UK	104
Südösterreich, Austria	101
Ostösterreich, Austria	94
Schleswig-Holstein, Germany	92
Mean	145
Median	117

Note: Data are provisional and are at sub-national, NUTS II, level for EU countries.

Source: Eurostat.

What maybe even more disquieting is that the relative performance of the GSE regions with respect to this measure of innovation output has not improved over time at all. Figure 16 reveals this, at best stagnant and at worst declining performance of the GSE regions in the last decade or so.

Figure 16: European patent application rankings of the GSE regions, 1990-2003



Note: Data are per millions of inhabitants.

Source: All data except for 2002 comes from Eurostat. For 2001 the data was constructed on the basis of population and patent data obtained separately. For 2002 the data source is OECD (2005).

Fourthly, there is the issue of innovation diffusion. Although this is hard to track empirically, one indicator of the capacity for innovation diffusion is the number of people employed in knowledge intensive business services (KIBS). This indicator can be considered in a way as a measure of both innovation input and output. One example of KIBS is high tech services. This is one aspect of innovative milieux in which the GSE has some comparative advantage in the global economy. Table 10 presents some comparison of this measure of both innovation input and output within Europe. South East leads the top ten territories but London and Eastern region are not part of the top club.

Table 9: Regional variations in innovation related employment in Europe, 2003

Employees in knowledge intensive services as % of total services employees	
Top 10 Territories	
South East, UK	17
Berlin, Germany	16
Scotland, UK	14
Schleswig, Holstein, Germany	14
Dunántúl, Hungary	13
Ile de France, France	13
Közép Magyarország, Hungary	12
Méditerranée, France	12
Südösterreich, Austria	11
Baden, Württemberg, Germany	11
Mean	8
Median	7

Note: Data included are at sub-national, NUTS II, level for 11 EU countries: Belgium, Germany, Greece, Spain, France, Ireland, Italy, Netherlands, Austria, Finland, United Kingdom. No. of regions is 68.

Source: OECD (2005).

At the world scale all three constituent regions have returned figures above the global high performing mean in terms of high tech services. This is not too surprising as the GSE is a post-industrial service based economy in which other KIBS also make up highly significant elements particularly of its internationally tradable economy. Nevertheless, regions such as San Francisco, Tokyo, Uusimaa and Stockholm have all had higher proportions of their workforces employed in high-tech services in the past than the GSE.

A similar measure of both innovation input and output is the number of people employed in high technology manufacturing. The Europe wide comparison shown in Table 11 paints a better picture for London and Eastern region, and all three are now included in the top ten.

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Table 10: Regional variations in innovation related employment in Europe, 2003

Employees in high technology manufacturing as % of total manufacturing employees	
Top 10 Territories	
Aland, Finland	69
London, UK	61
Manner Suomi, Finland	59
Hamburg, Germany	57
South East, UK	57
Berlin, Germany	57
Bruxelles Capitale, Belgium	56
Ile de France, France	56
South West, UK	55
Eastern, UK	54
Mean	47
Median	48

Note: Data included are at NUTS II level for 11 EU countries with available sub-national data: Belgium, Germany, Greece, Spain, France, Italy, Austria, Portugal, Finland, United Kingdom, Hungary. No. of regions is 68.

Source: OECD (2005).

Fifthly, business networks are a further comparative strength of the GSE service economy and its capacity for diffusing innovations within and between sectors. Studies of the banking and financial services sectors in the City of London have shown the existence of strong linkages between key sectors such as banking and insurance and KIBS such as management consultancy, legal services and market research. Other studies have shown how some of these networks extend across the GSE particularly around its Western Arc

Summary of the challenge and the way forward

This analysis of the relative capacity of the GSE regions both in terms of innovation output and the inputs required to keep up with the world's most innovative regions, shows that it has some way to go to compete on level terms with the top performing regions. Many of these are found in the USA but there are also others located in Europe and the Far East that also, in the past, have invested more in the key inputs to innovation. These regions generally invest more per capita on human capital in such forms as higher education than the GSE regions. Similarly there are several regions across the world where in comparison to the GSE regions there has been more investment in R&D. This is then reflected in one of the indicators of potential innovations namely patent registrations. But it should be born in mind that many of the world's high performing regions in the USA, Europe and the Far East have a higher manufacturing base than the GSE which, although it contains some of the most productive manufacturing in the UK, is primarily a service dominated economy. The GSE regions appear to be strong in the area of employment in KIBS. Only a few

regions in the USA, Europe and Japan employ relatively more in high-tech services and other KIBS.

In order to develop its innovative capacity so as to compete in world markets the GSE regions need to build on their existing strengths that are primarily in services and some medium to high tech forms of manufacturing. Toward facilitating this endeavour the three respective RDAs need to make a concerted effort through selected joint programmes and policies that maximise the benefits to each region and to the national economy at large.

5. Fulfilling the Potential for the GSE: the Need for a Broad-based Initiative

Maintaining and diffusing the competitive advantage of GSE in the UK and at the Global level by maximising the leverage of RDAs

In summary, the three regions of the GSE have strong commonalities in terms of economic structures and outcome measures. And such commonalities prima facie make coordinated large scale programmes and policies both feasible and necessary. It is feasible because conflict of interest and priority are less likely to arise, and there could be larger set of homogenous resources at the agency's command. It is necessary because one needs to avoid unnecessary duplication of efforts, and because effectiveness/ success of programmes often entails large scale and joint operation.

In other words, the evidence presented above generally suggests that there is a potential for coordinated programmes and policies across the three RDAs from which each of the three regions would benefit, and thereby enhance their impact on the national economy. Major strategic value added from coordinated activities are associated with reduced duplication of resources from regional partners and scaling up of projects and programmes to beneficial levels that achieve scale economies and provide for critical mass in securing benefits.

Having pointed out, in broad terms, the potential common policy requirements owing to the common economic characteristics of the three regions of the GSE, it should be stressed that the nature and concrete forms of fruitful areas of Tri-RDA cooperation have yet to be worked out. However, we can identify the major issues for which a Tri-RDA cooperation would maximise the policy leverage. These are summarised below.

- How to maintain the GSE comparative advantage in the long–term, so to front the increasing competition at the European and the global level?

- How to favour a process of 'crowding in' rather than a 'crowding out' from the GSE vis à vis the rest of UK regions?

- In this last respect, how to enhance a process of knowledge spillovers from the 'knowledge generating' to the 'knowledge using' locations?

The issues identified above can also be seen in terms of a multilevel policy action, which locates the potential areas of intervention along the lines of a local versus

global scale. Different levels of policy action and coordination can be envisaged, which go from the local/firm level, to the sectors and clusters sub-regional and regional levels, up to the national science and technology policy. The European and global level of interventions are somehow exogenous within this context, though they have to be taken into account as a framework to articulate domestic sub-regional level of intervention.

In this context, it is crucial to define the boundaries of a meta-regional level of policy intervention and coordination. The GSE Innovation Initiative aims to give content and dimension to a 'meta-regional innovation policy' and suggest the way it should be operationalised. A Tri-RDAs coordination should therefore be enhanced along the following lines, which are detailed in below

- Increasing the demand-side of knowledge transfer;
- Identifying a technology road mapping and network development;
- Overcoming barriers to growth for small and medium enterprises;
- Enhancing the international profile of the GSE;
- Enhancing the competitiveness of KIBS.

A key aspect of developing an innovation strategy for the GSE will be to identify the areas where the geography of competitiveness and innovation indicate that a 'meta-region' approach would yield the greatest benefits for the GSE and the UK as a whole. The experience of the Massachusetts Science and Technology Initiate in the USA suggests that a crucial first step is to assess the core technologies and strengths of the region. This was achieved in Massachusetts by identifying a set of metrics to measure clustering in the region, such as the number of firms working on a specific technology and their size, the number of degrees awarded and research excellence based publications, patents, citations and research and development expenditures.

Following the identification of the key technology strengths of the GSE, a second important step will be to identify a number of potential alliances among the stakeholders in the region which draw on more than one of these core technology strengths, engage a range of key industries and guarantee that several sub-regions of the GSE are included in each partnership.

Massachusetts – Science and Technology Initiative

The mission of the Massachusetts Science and Technology Initiative was to formulate a state policy to facilitate and support major science and technology education and research initiatives, in order to enhance Massachusetts competitiveness and promote economic growth.

The initiative started with a "Call to Action" report released in the year 2000 by Mass Insight Corporation (Mass Insight, 2000), a public policy consulting firm based in Boston, Massachusetts. In it, high-tech executives and academic leaders expressed concerns that Massachusetts was performing poorly in terms of university-business collaborations. As a result of this report, Mass Insight organised a series of meetings of business and academic leaders to draft a mission statement and set short- and long-term priorities for a Science and Technology Initiative.

During the 2002 Massachusetts gubernatorial campaign and as part of the initiative, five prominent CEOs drafted an open letter to the candidates, encouraging them to debate and discuss the need for a technology-based economic development initiative. In response, both leading gubernatorial candidates endorsed the broad agenda of the initiative. The presidents of MIT and UMass subsequently co-authored an editorial in the Boston Globe, endorsing the need for a state-wide science and technology development strategy.

In 2003 a follow-up report, "An Economy at Risk", set out the aims of the Science and Technology Initiative, which included the need for a detailed Technology Roadmap for Massachusetts (Mass Insight 2003). The report identified several reasons for the Massachusetts legislature to take action, among them the need to take better advantage of the resources of private and state universities, the need to attract federal funding for science and high tech research, and the need to counter successful initiatives in competitor states such as California and New York. Following the report, the Massachusetts legislature adopted a "Science and Technology Resolve", which provided funding for the framework.

In 2004 the Massachusetts Science and Technology Initiative released a Technology Road Map, developed by a broad-based consortium of leading business, university and economic development institutions (Mass Insight, 2004). The aim was to identify potential strategic alliances among public and private research centres, industry and government in order to maintain and expand the leadership of the state in emerging technologies.

An assessment was made of the core technology strengths of Massachusetts. These were identified using metrics such as the number of firms and employment, talent generation in the form of degrees awarded, and research excellence based on academic and industry research and development expenditures, patents, publications and citations.

Potential strategic alliances were then selected based on the availability of federal R&D funding in specific technology fields and the prospect of linkages to industry active in Massachusetts. These possible opportunities were screened in terms of the size of their economic impact. Assessments involved markets forecasts and expert interviews.

Following the identification of these potential strategic opportunities, and under the auspices of Mass Insight Corporation, several industry-led work groups were set up to consider the strategic opportunities in more detail, with the aim to explore possible large-scale projects where multi-institutional, cross-sector collaboration could generate economic value in a way that no single institution or sector could do on its own. The work groups included leaders from private and public institutions, and the funds to finance the development of these collaborative partnerships included state matching funds disbursed through the John Adams Innovation Institute, created in 2004.

The success of the Massachusetts Science and Technology Initiative highlights the importance of building networks among academic, industry and government stakeholders. While the work groups on potential strategic partnerships have been led by industry, the process has involved public and private academic institutions, and government at all stages. An important consideration from the start was that the initiative should be inclusive, but led by a few senior partners. The presence of a few key players, such as Jack Wilson of UMass, and Paul Grogan of the Boston Foundation was also important for driving the process forward.

Success in driving the process forward will rely upon the engagement of key stakeholders in the region, a key determinant of the success of the Massachusetts Science and Technology Initiative, which is also evident in the process of cluster-based specialisation observed in one of the most dynamic regions of Europe, the Tampere region in Finland. A regional partnership of businesses, science and technology departments in public and private universities and local development agencies succeeded in aligning their interests to improve infrastructure and create networks and encourage the growth of new technology clusters in order to attract new industries to the region and modernise traditional industries.

Tampere, Finland – Cluster-Based Specialisation

The case of the city-region of Tampere, located in south-central Finland, is an example of how a declining industrial cluster can reinvent itself in order to prosper in the new knowledge economy. Tampere has historically been the industrial heart of Finland, and the rise of its traditional industry, mechanical engineering, can be traced back to the pre-WWII period, when the metal industrial experienced a rapid expansion following the opening of a state airplane factory in 1931.

Like similar clusters in the EU and the US, the traditional industry in Tampere underwent a long period of decline in the 1970s, in this case aggravated by the collapse of the Soviet economy, which until 1989 had been the main export market for Tampere's machinery firms.

The strategy of Tampere has been to modernise traditional industries and to develop new high-technology clusters. Today, the region promotes a diverse and controlled cluster-based specialisation, particularly in the fields of ICT, health and biotechnology, mechanical engineering and automation, media and communication, and knowledge-intensive services. Companies belonging to these clusters are supported by universities, research institutes, technology centres and public and semi-public institutions.

Tampere University of Technology (TUT) has played a crucial role in the process as a provider of skilled labour, technical know-how and problem solving to the local industry. Specialised research centres connected to the TUT, such as the Digital Media Institute (DMI) and the Optoelectronics Research Centre (ORC) bring together research and education and liaise closely with local businesses.

National organisations such as the Technical Research Centre of Finland (VTT) have also been instrumental in building cross-industry technology platforms and transferring knowledge and technology across industries and disciplines.

The synthesis between the traditional and new technologies has also helped by the presence of a sizable group of information technology and communications firms, anchored by a Nokia research centre established in 1987. The development of the telecommunications and other high-technology clusters has been strongly encouraged by the regional government, through the establishment of the Tampere Technology Centre in 1990 and Professia, an incubator for knowledge-intensive business services established in 2000.

At the regional level, Tampere is a good example of how a combination of a strong knowledge infrastructure, corporate vision and leadership and active local development policy can succeed in promoting cluster-based specialisation and reverse the decline of traditional industries.

In the case of the GSE an important issue will be to continue to identify the key stakeholders in the region, and facilitate the process of alignment. In order to identify alignment among stakeholders in the GSE, a stakeholder alignment survey was distributed under the auspices of the Cambridge-MIT Institute to a group of 25 individuals from 21 stakeholder organisations of the GSE in March 2006. The data collected by the survey were analysed by Dr Joel Cutcher-Gershenfeld and Dr Betty Barrett of the MIT Project on Lateral Alignment in Complex Systems.

The results of the analysis indicate that there are concerns about the level of clarity regarding levels of governance within the initiative, and about the lack of appropriate forums for discussion, particularly among university and industry stakeholders. These results highlight the need for a technology roadmap study which would identify the key strengths and weaknesses of the region, and determine the areas where economies of scale indicate the benefits of meta-regional cooperation.

In addition to identifying and developing the strengths that span the regions of the GSE and to achieving economies of scale in innovation policy and science and technology partnerships, the regional development agencies of the GSE can cooperate in areas where sharing best practice can improve institutional learning and competences. The experience of the North Carolina Research Triangle Park shows that the development of strategic technology partnerships can also help to support sectors that are crucial for employment and growth in more rural parts of the region.

North Carolina – Research Triangle Regional Partnership

In the 1950s, a group of government, university and industry leaders conceived the idea of the Research Triangle Park (RTP) as a public-private research park located between Duke University in Durham, North Carolina State University in Raleigh, and the University of North Carolina at Chapel Hill. The aim was to promote cooperation among business, public and private research organisations.

After a slow start, the Park's growth accelerated in the 1970s following the arrival of IBM and the National Institute of Environmental Health Sciences and it continued growing at a high pace over the 1980s and 90s. Between 1990 and 2000 more than 40 new companies established facilities in the RTP. It is now the largest research park in the world, home to over 130 research and development organisations including IBM, Cisco Systems and GlaxoSmithKline.

Also located in the Park are the North Carolina Biotechnology Center, a state-supported initiative that provides grants and creative services to support biotech companies and MCNC, which offers advanced resources in micro-fabrication and telecommunications and houses the North Carolina Supercomputing Center. Together, they provide services and resources to North Carolina companies, universities, and local entrepreneurs. All of these institutions work together with the Park companies, contributing to an environment of cooperation and learning within a scientific and technological community.

In 2001 a comprehensive study into the RTP by Dr Michael Porter of Harvard University concluded that while the Research Triangle Region enjoyed strong growth over the 1990s, purposeful action was needed to respond to competition from other regions, the impact of recessions, loss of manufacturing jobs and low growth in rural counties (Porter, 2001).

The Park responded by devising a new competitiveness plan, which identified the key assets of the region and its technology strengths, and determined eight growth areas that represent the best opportunities for sustainable growth and job creation in the near term. In addition to these areas, the initiative resolved to promote two industry sectors that are important for job creation in more rural parts of the region: vehicle component parts and logistics and distribution.

The success of the Research Triangle Regional Partnership provides support for the notion that a broad-based initiative is needed to create and sustain a regional innovation cluster in order to stimulate growth and job creation. It also stresses the importance of conducting regular competitiveness reviews in order to maximise the potential impact of regional development strategies.

6. Key Policy issues: the Stakeholder Perspectives

6.1 Demand side of knowledge transfer

The main issues related to the demand-side of knowledge transfer can be summed up as follows.

- The constraints of demand of knowledge transfer;
- The gaps between knowledge supply and demand in terms of goals, incentives, information flows and resources;
- The hampering factors to increase demand for knowledge transfer.

The problems of definition of the demand side of knowledge transfer relate to the identification of the crucial sectors and industries which the demand should stem from. These must substantially contribute to country's 'high tech' competitiveness, such as Nano-tech, Aerospace. Also the Farming sector should be considered as one of high potentiality for technological innovation and competitiveness enhancement.

The supply side problems of the knowledge transfer process mainly relate to the attraction of students in the crucial areas identified above. It has been raised the issue of how to increase the appeal of disciplines such as science and engineering, which students tend to disregard, as the demand coming from the job market is low and poorly rewarded.

The public sector is seen as a crucial innovation generator for private sectors, which might be considered as a filière of innovation production and use. In particular, the public sector should reach the adequate critical mass to be able to produce innovation and to act as a diffuser of innovation for the private sector. In this respect, increasing the absorptive capacity of the private sector should also be amongst the top policy target at the meta-regional level. The benchmark for creating for this type of division of labour is the US system – namely the Massachusetts Science and Technology Initiative (see above) - especially as far as the procurement issues are concerned.

One of the suggestions in this respect has been to find analogies between the RDAs and the State Federal Government in the US, which support private innovation. RDAs could therefore provide funds or participate with venture capital in the relevant private sectors.

Some of the issues raised belong to structural national problem and do not specifically relate to the RDA level of policy intervention. The macro-regional areas of potential action might rather be identified in gathering information (i.e. on the network university-industry) and provide access to it.

The main indicator for success for the implementation of demand of knowledge transfer should be the extent, nature and degree of university-industry links. Further, the RAE is also a measure of success. It has been highlighted as well that increasing the number of collaboration between the universities and the Small Enterprises should be a crucial policy target.

The funding problems might be partly overcome by augmenting the scale of the provision of funds – i.e. putting together the three RDAs funding strategies.

A possible way of implementing this is to create a TRI-RDA meta-budget on innovation, which could act as a starting point to create public demand for innovative companies.

To sum up, the main issues related to the demand of knowledge transfer are to be considered in terms of their national or regional relevance.

Issues attaining to the national level of policy intervention relate to:

- The size of the demand 'pool' for high technology transfer. This should be enlarged both by direct government demand and by facilitating and increasing the critical mass of students in hard science;

- The overall strategy of matching demand and supply of technology transfer should be viewed as a national-scale policy target.

Rather, the issues of policy relevance at the regional (and meta-regional) level would focus on:

- Creating and maintaining an 'Information Gateway to Knowledge';

- Mapping the regional sectoral structure according to the most promising areas of cooperation with technological knowledge suppliers.

6.2 Technology road mapping and network development

One of the key aspects of a coherent Science and Technology framework for the GSE is the need to develop a technology road map (see above for evidence from Massachusetts, USA). This would include an analysis of how the core technology skills and physical resources in the GSE can be combined to create a critical mass, benchmarked against foreign competitors, to attract further resources to the GSE. Collaborations between universities, business, government and the community would be harnessed to bring economic development and economic value to the area, and to the UK as a whole.

The technology mapping exercise would be useful as it would have an explicit link to economic development. Success would be measured in terms of heightened impact of the region on a global stage, the development of business services and networks and the recruitment of star academics.

In a meeting of key stakeholders from universities, business and government of the GSE in Cambridge in March 2006, the following aspects were suggested as important measures of success of a technology road map over a five-year period:

- Heightened impact
- Business services engagement in technology
- Networks built around key people and industries
- Identified funding focus
- Star recruitment

- Self-sustaining benefits

A key issue discussed during the meeting was the importance of identifying metrics which can be used to measure success. The group agreed that a set of clear metrics would need to be identified. The experience of the Massachusetts Science and Technology Initiative suggests that possible metrics of success of the technology roadmap are:

- National funds and grants awarded to new initiatives in the meta-region
- The retention of science and technology graduates in the area
- The distribution of economic benefits across the meta-region
- The number of degrees awarded in specific areas of interest
- Investments in infrastructure, particularly in housing
- Improvements in science and technology test scores in local schools

The GSE group discussed the need for leadership, and the question of who should work on a technology road map. Sector-specific representatives within the research councils would need to be involved, but there is also a need for people who work across different sectors.

A related issue is who brings the universities together. Academics are mostly interested in research. There should be a strategy for attracting star academics to the area, in particular those who are interested in applied research. Incentives and quality of life issues would be crucial in this regard. The group also identified the need to take a longer view, and there was a discussion on the need to identify funding support.

6.3 Overcoming barriers to growth for medium-sized firms

Any effort aiming at enhancing the competitiveness of the GSE should involve tackling the constraint on the growth of small and medium sized firms (medium-sized firms are those with 50 to 250/500 employees), A more pressing challenge appears to be the growth of small firms to become medium-sized firms.

The following factors can be suggested as potential barriers for the growth of firms:

- Satisfying culture, i.e. firms may not have the ambition to be mega rich

- Reluctance to handover management that growth may necessitate

- Lack of expertise to reach ‘escape velocity’ by addressing global markets. In this connection, it was pointed out that growth by addressing neighbouring markets can be constrained by the heterogeneity of markets within the EU

- Lack of skills, specifically the right combination of the right skills, which includes the range of management skills and technical skills. This should not however be a serious problem because the GSE should be able to attract skills from other areas

- Migration of growing firms can also be a problem. This suggests that any public policy support towards growth enhancement of firms should selectively target those with a potential 'legacy impact', i.e., those that would not leave the region.

Success in the growth of firms would entail the following main elements:

- Employment generation
- Prevalence of serial entrepreneurs
- Attraction of business into the region
- Increase in firms' profit
- Growth of GVA and productivity
- Increase in supply chains

A concrete solution to tackling the barriers to the growth of small/ medium sized firms should be based on a strategy of identifying model firms and helping them attain 'escape velocity'.

6.4 Intensified Internationalisation of the GSE

As identified above the GSE is competing in an increasingly globalised market. Intensified internationalisation of the GSE essentially means being at the centre of the global marketplace where companies and people are attracted to the region from around the globe and GSE businesses are outward looking.

The effort of internationalising the GSE should exploit the fact that the region is home to the world class universities of Oxbridge and London. When companies consider doing business here, they tend to think of the UK or London, without a concept of the GSE. There is, therefore, a need to raise people's awareness of the proximity of these great universities within the GSE economic entity. However, the question of whether or not these universities can be effective commercial partners is critical to a strategy of internationalising the GSE on the basis of proximity to the pinnacle of academia. It is possible that the universities are not fully engaged with business.

A central focus should be on the issue of what can be offered on the international market. The GSE should attempt to pick up two to three areas for particular attention and use these to achieve competitive advantage in the global market.

Success in the internationalisation of the GSE would be characterised by the following elements:

- Places like Silicon Valley would be measuring their success against the GSE.
- Efficient infrastructure across the region.
- Effective mutually beneficial global partnerships.
- Moving up to the higher leagues in the various economic indicators, consistent with the global position of the region.

6.5 Enhancing the growth of knowledge intensive business services

The boundaries of the knowledge intensive business services (KIBS) are yet to be defined in terms of sectoral composition and contribution to the national competitiveness. The GSE has particular strengths in terms of sectoral specialisation towards KIBS and faces therefore significant constraints and challenges to maintain the 'KIBS comparative advantage'.

The term KIBS has been coined relatively recently (Miles, 1994; Miles et al., 1995). The acronym KIBS is now widely used in the empirical literature (Den Hertog, 2002; Gallouj, 2002a and 2002b) and has also become a commonly used unit of analysis for policy makers. Although there is still not unanimous consensus on the sectoral boundaries of KIBS, the great majority of the empirical contributions are based on a definition of KIBS as including finance, computer and related activities, business services and private R&D. The GSE competitive strength is widely recognised as relying on a strong sectoral specialisation in KIBS, though mostly located in the region of London.

The main issue raised has been the definition and measurement of the service product per se, and, as a consequence, of innovation performance in services. Does it still make sense to talk about peculiarities of innovation in services vis a vis manufacturing sectors? Indeed, despite the increasing interest in this domain of analysis, the issue of whether we can extend to services the use of measurement tools and indicators commonly employed for manufacturing output is still very much at stake. Since the seminal work by Griliches (1992), no substantial methodological improvement has been carried out, leaving us with an important methodological and empirical gap. Despite this, substantial progress has been made over the last decade in terms of service data coverage (both for economic and innovation indicators). Hence, the empirical literature dealing with innovation in services, mostly based on the use of the Community Innovation Survey, which now fully covers service industries across all European countries, has bloomed and now provided a fair amount of empirical evidence.

However, much has still to be done on the nature and degree of interdependence between high-tech manufacturing and KIBS, so to evaluate the overall innovative and economic performance of KIBS. This stream of analysis has got important implications to assess the contribution of GSE as a 'KIBS specialised regional innovation system' to the overall UK innovation and economic performance.

The issue of how to increase the (national and international) demand 'pool' for UK KIBS, in the view of maintaining the GSE 'KIBS competitive advantage', has been raised. It has been agreed that the most challenging policy target should be to enhance international competitiveness of KIBS in the UK (namely in the GSE). This would ensure a sustained level and growth of global demand to keep the growth pace which UK KIBS have had in the past decades. The medium-long term strategy is therefore to ensure that KIBS are able to face the increasing international competition. This target would entail policy measures – and namely meta-regional policy measures – to boost innovation expenditure and increase their innovation returns in terms of long term productivity figures.

Although outside the traditional boundaries of KIBS, which are typically private and market services, the competitiveness of the NHS, both at the national and the global level, has been put forward as one of the key measures of service competitiveness in the GSE.

7. Strategy and Recommendations

As described throughout this report the UK's Greater Southeast region plays a critical role in the overall strength of the UK economy, representing roughly 43% of UK GDP. The GSE is near the top of the league tables for the major innovation indicators, but is facing a series of challenges related to the accelerating pace of international competitiveness and the changing nature of innovation. It is broadly recognized that innovation is a systems phenomena that relies on interactions across institutions and stakeholders in the higher education, research, business, and government sectors. Many critical elements of this system operate within and across the GSE, an economy that extends across a variety of administrative, policy, planning, and governance boundaries. As a result, it is difficult to effect systemic change in key areas related to the innovation process across this meta-region.

As innovation systems have become increasingly understood, regions have begun to apply this insight towards the development of cooperative local strategies in the competition for markets, human capital, trade and investment. The resources and capabilities that constitute the GSE provide the raw materials for a world leading knowledge economy, but the opportunity to fully realize this potential will rely on mechanisms to better coalesce these resources to identify and strategically respond to market and policy opportunities. Lacking such mechanisms all regions of the GSE have fallen in recent years in the World Regional Competitiveness rankings.

Our efforts to benchmark the innovative performance of the GSE and take initial assessment of the opportunities for strategic advantage in knowledge-based economic growth have included economic and survey analysis and consultation with stakeholder constituencies. This process has yielded a series of recommendations for advancing GSE innovation and competitiveness. These recommendations suggest steps to foster GSE-level coordination for RDA-based innovation programs, to create the administrative mechanisms for tri-RDA coordination, to continue to refine and develop the image of the GSE as a world-class knowledge economy in the way of Silicon Valley and Boston, and to inventory and coalesce local resources towards a shared vision and action plan for knowledge-based growth.

The specific recommendations for immediate action are:

1. *Elevate the visibility of a GSE Innovation Initiative and expand leadership participation.*

   Successful regional innovation strategy can not be run as a top-down activity. It requires strong support from local leadership in the higher education, research, and industry sectors. This leadership must understand the opportunities for such an activity to gain participation based on enlightened self-interest. A GSE Autumn 2006 Science Technology and Industry spending review summit with OSI/Major of London would provide an opportunity to

highlight the vision and importance of the innovation initiative. This would be a one day event to be held in the fall of 2006 for the purpose of promoting the GSE initiative, announcing key initiatives, and encouraging stakeholder support and participation.

2. *Inventory GSE capabilities in the context of global markets to reveal strategic research, investment, and partnership opportunities.*

   There is no 'one size' fits all formula for innovation policy and strategy. Solutions must be context-based and rely on a detailed assessment of local capabilities in terms of skills and human capital, research, education, business, and institutions. Technology Road Mapping evaluates these resources in view of market factors and stakeholder interests to identify priority area of focus for partnership, research, and investment opportunities to develop and enhance competencies for competitive advantage. Such an analysis ranks opportunity areas based on factors such as talent generation, research excellence, and industry presence. A strategy framework is then applied to promising areas to evaluate them in the context of market, geographic, institutional, and policy factors to reveal opportunities for competitive advantage. The Science and Industry Councils from the three RDAs are expected to provide important input into this process.

3. *Promote harmonization of innovation programmes and institutional learning across the GSE RDAs.*

   The GSE RDAs share a set of common goals in supporting the development of high growth companies. EEDA, SEEDA, and LDA are each addressing the challenge in encouraging and enabling small and medium sized firms to meet their growth potential. Each of the RDAs has programmes and expertise in this area and it is recommended that these programmes be evaluated to determine opportunities for joint GSE-level programmes in areas such as best practices for advancing innovation, developing meta-networks, creating a GSE-level Business Fellows programme; medium-sized business programmes; and seed-funding and proof-of-concept programmes. Such an analysis would review the relevant enterprise support programmes in the 3 regions in terms of goals, the types of interventions being undertaken, staffing, expertise, and success metrics. The intent of this analysis is to determine if there are opportunities to consolidate like programmes in ways that they would be able to be administered at the GSE level and to identify opportunities for sharing best practice across organizations. GSE-level programmes offer the dual benefit of economy of scale in programme administration and of broadening the resource base which can be drawn on to provide company support in the way of networks and partners.

4. *Promoting the GSE as a global brand for trade and investment.*

   The resources of the GSE in terms of world-leading universities, access to capital, talent, and quality of life provide a uniquely compelling case for branding in the area of trade and investment. It is recommended that a study be undertaken to understand how this opportunity can best be capitalized from a branding, messaging, and communications standpoint. Such a study would rely heavily on focus groups to understand current perceptions and to inform

and trial potential branding and messaging strategies. This activity would be undertaken in close collaboration with UKTI.

5. *Establish the institutional mechanisms for GSE-level policy and programme coordination across the GSE RDAs.*

   Identify the umbrella leadership, institutional ownership, and coordinating framework and mechanisms for driving the above activities. It is recommended that a full-time professional be appointed to coordinate and spear-head GSE activities. This person will report jointly to a designated enterprise or innovation director in each RDA and will be responsible for the development and oversight of tri-RDA initiatives. For this position to be effective it will need to have clearly defined and focused areas of ownership and accountability. It is recommended that these responsibilities be crafted in such a way that they minimize conflict with existing RDA-specific functions.

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