South East England Partnership Board

SOUTH EAST ENGLAND STRATEGY THINK PIECE

1

Economic growth and technological innovation

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> PROF PAUL KRUGMAN
> 2008 NOBEL LAUREATE IN ECONOMICS
> PRINCETON UNIVERSITY

> "Innovation rather than price competition is what drives the market process."
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> SPRU (Science & Technology Policy Research) University of Sussex

Summary

- Economic growth is driven by employment growth and productivity growth. The latter is the most important driver of competitiveness and growth over the longer term. Although employment growth has historically been strong in the South East, the contribution that it could make to economic growth is limited by the fact that there is limited scope to increase employment rates in the region beyond their pre-recession level. However, there is significant scope to improve labour productivity, in order to sustain long-term growth and prosperity in the region.
- Future economic growth in the South East and UK is likely to be driven by high-growth indigenous firms as well as foreign investment, which not only creates employment opportunities but also contributes to productivity growth through the inflow of new technologies and knowledge. It is important for the region to improve its skills base in order to compete in a global economy and to ensure that the supply of skills matches the demands of firms across the economy and in high-growth sectors.
- However, arguably innovation is the most important driver of productivity and long-term growth. Innovation has benefits not only at the firm level (through improved efficiency), but also at regional and national level (through knowledge spillovers) and globally (in tackling climate change, for example). In an increasingly competitive global economy, companies need to innovate in order to survive and prosper. Expenditure on research and development in major developing economies, such as China and Brazil, has increased significantly in recent years, posing a challenge to the developed world.
- At the same time, the current recession is having an adverse impact on innovation-related investment. Small firms in particular are having difficulty accessing funds, especially for higher-risk projects. Many firms are reluctant to introduce innovations during a downturn as it is more difficult to recoup the costs. However, the recession can create opportunities for innovation, as new players seize gaps created where once dominant firms are weakened.

- Innovation itself is not sufficient to generate productivity improvements since there is a need to translate scientific innovations into marketable and profitable products.

1. Introduction - the drivers of economic growth

1.1 Over the past two decades the South East was one of the most successful regional economies in Europe. Gross Value Added (GVA) per head is the most widely used measure of regional economic performance in the UK and based on this measure the South East is the second most successful region after London. Over the past 20 years GVA per head in the region has increased from below the national average to around 7% above the national average (Figure 1). Regardless of the indicator used the South East is usually the best performing UK region outside London.

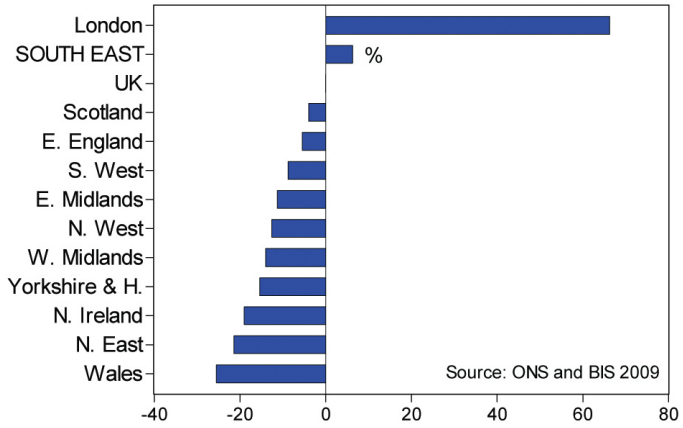

Figure 1: GVA per head (relative to UK average), 2007

1.2 However, regional data often masks significant sub-regional disparities in economic performance. There are significant disparities in GVA per head within the South East – from almost 40% below the UK average in the Isle of Wight, which is below some of the new European Union (EU) member states from Central and Eastern Europe, to over 60% above average in Berkshire (Figure 2). Furthermore, if we exclude central London from our analysis, then the level of disparities in GVA per head in the South East is the greatest in the UK.

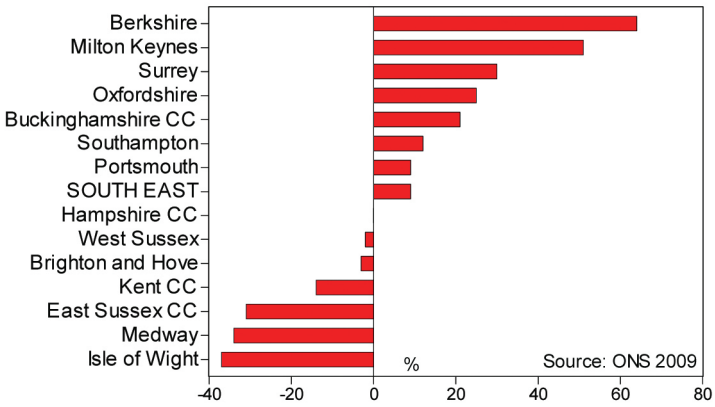

Figure 2: Sub-regional disparities in GVA per head (relative to UK average)

1.3 At the most basic level, regional GVA or economic growth depends on two things: how many people are working and how much they produce (how productive they are).

Employment growth

1.4 One of the main reasons why the South East's performance on GVA per head has improved is down to the strong contribution of employment to regional growth. Over the past two decades there has been a significant increase in employment, which has led to one of the highest employment rates amongst developed economies. However, there is a constraint to the contribution of labour to long-run economic growth as there are obvious limits to the number of people of working age available for work. Therefore, employment is a major contributor to regional prosperity over short to medium term.

1.5 Empirical evidence shows that increasing the employment rate above 80% is extremely challenging for a number of reasons (for example, skills, availability of jobs in the area) and given the trend of an ageing population, it could prove even more challenging in the years to come.

1.6 The current recession has halted economic growth in the South East and once growth returns the impact of the most synchronised and deepest global recession since the 1930s will be felt in many areas of the region and for many years to come. The most obvious impact will be on the employment rate, which has dropped by more than two percentage points since the start of the recession. There are now some 90,000 fewer people in employment in the region than in early 2008. Furthermore, it is likely that employment growth in the region will be more subdued over the next two decades than was the case over the past two decades.

1.7 Therefore, since employment alongside productivity drives regional prosperity (GVA per capita), employment growth is one of the most obvious areas that will require public sector intervention over the short term. This is particularly true in a number of areas characterised by weaker labour markets (many peripheral sub-regional economies) where, following the recession, employment growth is often more subdued than in the more prosperous parts of the region. Since many coastal economies are dependent on public sector, seasonal, construction and lower value-added manufacturing, it is likely that there is going to be less scope for employment growth in these areas than elsewhere.

Productivity growth

1.8 Economic theory and empirical research show that over the longer term, productivity growth is the most important factor that drives regional and national competitiveness and growth. To use the words of Paul Krugman, the 2008 Nobel Laureate in Economics: "Productivity isn't everything but in the long-run it is almost everything". Therefore, in the long-run only increases in labour productivity can produce ongoing increases in living standards.

1.9 Figure 3 shows labour force utilisation (measured as employment rate) and labour productivity relative to UK average. Half of UK regions are characterised by a relatively low employment rate and low productivity (area C in Figure 3). London is the most productive region, but it also has the lowest employment rate in the country (area B). The South East is placed in the high employment and high productivity area (area A). However, whilst there is little scope to significantly increase employment rates in the region over the longer term, there is clearly plenty of scope to increase labour productivity.

1.10 London is a good example that shows the importance of productivity in increasing regional prosperity. It has the lowest employment rate in the country, but by far the highest productivity and in turn by far the highest GVA per capita (Figure 3 and Figure 1), a consequence of a high concentration of highly productive innovative sectors.

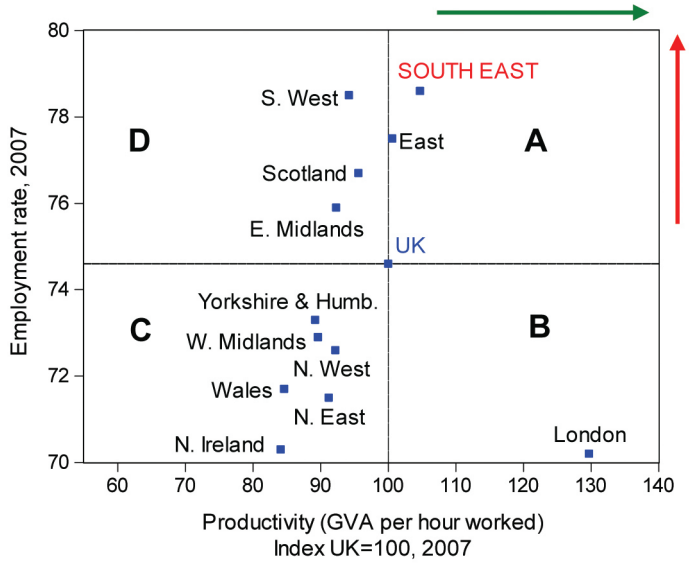

Figure 3: Labour Force Utilisation and Productivity

1.11 Therefore, productivity is the most important factor that determines regional competitiveness and wellbeing. Productivity is often considered as a Holy Grail of economic growth and development. It is driven by the five drivers of productivity (skills, enterprise, investment, innovation and competition).

Enterprise

1.12 Enterprising activity refers to the seizing of new business opportunities by both existing firms and start-ups that bring new ideas, knowledge and skills into an economy. Therefore, enterprise is an important driver of productivity since it leads to high levels of competition, innovation, investment and skills in the region or sub-region – and for job creation and productivity.

1.13 There are significant differences in business start-up and survival rates between regions and even greater differences within regions which, in turn, impact on industrial structure. According to a number of empirical studies, the substantial differences in regional and sub-regional productivity can be explained by a fairly limited set of indicators, one of which is enterprise (industry mix). This is easily observable across the region – those economies with a more diverse industry mix and higher concentration of higher value added sectors tend to have higher employment and GVA growth rates. For example, a high concentration of financial intermediation in London helps to explain a significantly higher GVA per head than elsewhere or within the South East, while a high concentration of ICT and financial services in Berkshire helps to account for GVA per head which is well above the South East average.

1.14 Recent empirical research shows that high-growth firms in the UK represent only 6% of all UK firms employing 10 or more people, but account for more than half the growth in jobs. In the South East, there were 1,689 high-growth firms in the period 2005-08, which is 5.9% of all surviving businesses employing 10 or more people in 2005. Such findings

have important implications for policy as job creation is going to be important over the short to medium term.

1.15 The current recession has shown that there is a need to build a sustainable, broader-based economy, less dependent on a few large sectors of the economy, less dependent on domestic consumption and more orientated towards exports. The rebalancing of the economy will require greater public sector support across a narrow range of potential growth sectors or those highly productive export-orientated sectors. Hence, future growth and rebalancing of the economy will come from high growing indigenous firms supported by inward foreign investment. In addition to direct employment opportunities, inward foreign investment provides an economy with an inflow of new technologies, practices and knowledge developed elsewhere that benefits other firms and helps to raise productivity growth.

1.16 One of the consequences of globalisation is that it is actually increasing rather than reducing the importance of location (Krugman, Porter, Venables, Scott, Fujita etc). According to M Porter: "The enduring competitive advantages in a global economy are often heavily localised, arising from concentrations of highly specialised skills and knowledge, institutions, rivalry, related businesses and sophisticated customers".

1.17 The opponents of the industrial or business clusters concept often argue that greater public sector intervention could displace location of economic activity from one area to another. However, it is equally true that potential growth sectors are prone to a number of market failures in, for example, innovation, training, infrastructure spending and finance, that targeted public sector intervention can rectify.

1.18 Since there are significant differences in business formation and survival rates across the region it is necessary to encourage entrepreneurship activities across the region and provide business support in a number of key areas, such as access to finance, access to new markets and skills support. However, it is also important to recognise that much employment growth in the past came from a small number of high-growth firms and that such trend is likely to continue in the future.

1.19 Furthermore, agglomerations or clusters of firms is an important area for public policy since clusters of firms gain from the spillover effects from other firms' innovative activity, the existence of specific local labour markets, and market benefits both in terms of overall market size and through linkages between firms up and down the supply chain.

Skills

1.20 Skills are an important driver of productivity and a major factor that helps to explain the UK productivity gap with major developed economies. With a third of people of working age having an NVQ4 or higher qualifications, the South East is one of the best performing UK regions (behind London and Scotland). However, there are significant differences within the region - skills, as measured by qualification levels, are higher in areas closer to London. Peripheral areas of the South East and in particular areas of the coastal South East are characterised by much lower workforce skills than the regional average and in some cases national average.

1.21 The evidence from the National Employers Skills Survey (NESS) suggests that many employers in the region have significant problems finding workers with relevant skills. The skills gaps identified by employers in the region illustrate the fact that qualifications do not necessarily translate directly to skills in the workplace.

Furthermore, empirical evidence shows that there is a noticeable shortfall in technician skills, which holds back the absorption of innovations.

1.22 Survey evidence from employers shows that amongst the consequences of these skills gaps are poor standards, a lack of scope to innovate and the loss of business to competitors.

1.23 In a rapidly changing global economy, it is inevitable that a mismatch between the supply and demand for skills occurs. Therefore, there is a need for public sector intervention to rectify the mismatch between the supply and demand for skills by ensuring that skills needed to support new growth sectors are in supply and that there is a sufficient supply of skills to meet replacement demand. Given the degree of global competition and the role skills play in economic growth, no technological innovation and productivity catch-up will be possible without the people with the skills to deliver growth.

Innovation

1.24 It is often argued that innovation is the single most important factor for long-run growth. Its role has long been recognised, with Joseph Schumpeter in the 1940s coining the phrase 'creative destruction' to describe the necessary turmoil caused when the rise and fall of companies unleashes innovation, in the end making the economy stronger. William Baumol argues that "innovation rather than price competition is what drives the market process".

1.25 Much attention has been devoted to the subject, particularly during the boom of the 1990s, which was driven to a large extent by breakthroughs in information technology. A number of developed economies, such as Germany, and developed East Asian countries, such as Japan or South Korea, provide excellent case studies of the role that innovation can play with regards to economic growth. Empirical studies show that the growth of inputs (such as employment and investment) over the past decades accounts for just one fifth of the growth in GDP, with the remaining four fifths attributable to technological progress or innovation.

1.26 Without large amounts of natural resources, and without other 'bargaining chips', such as a large low-cost labour force (as in a number of developing economies, such as China and India), the ever-increasing integration of the world economy means that the South East and UK will have to have the ability to adapt, change and harness innovation as an economic engine in order to prosper in the future.

1.27 Furthermore, in an increasingly globalised world economy characterised by fierce competition, companies must innovate to survive and this implies that in the future they will need to collaborate more with research institutes and universities, pay more attention to the skills of their workforce and participate more in the business networks through which knowledge is increasingly diffused.

1.28 Technological innovation is crucial to achieving longer term, sustainable, durable growth, which has both economic and social benefits. Not only is it economically invaluable, particularly in the UK with its decline in manufacturing, but it is also essential to tackling global challenges such as climate change, as well as ensuring that the UK remains at the forefront of cutting edge technological development,.

1.29 The influence of investment in research and development (R&D), which helps to drive technological innovation, is not just about improved technologies, the externalities

are also beneficial, particularly the knowledge and best-practice spillover that feeds into the economic activity of other sectors. Because successful innovation improves efficiency (and therefore value for money) it should be integrated into any long-term plan for the economy. The Government has recognised this in its New Opportunities white paper. In addition, the Innovation Nation white paper set out the Government's objective to "make Britain the best country in the world to run an innovative business".

1.30 Technological innovation will play a crucial role in rebalancing the economy and driving future growth. However, in a service sector economy, such as the South East, non-technological innovation is also an important factor that could significantly boost the rate of growth in the short and long run.

1.31 Progress in the South East on a number of measures of innovation, such as R&D expenditure and proportion of turnover attributable to new products, has been relatively limited in recent years and the current downturn is having an adverse impact on innovation-related investment. Innovation-related investment is being adversely affected by the economic downturn internationally and the difficulty in finding funds is becoming a significant obstacle to entrepreneurship and new R&D. Smaller firms have been hit hardest, with short-term, low-risk projects being favoured by investors. Although some of the largest firms might well benefit from the reduced competition, leading them to increase R&D spending through the downturn, the most significant impact will be on would-be new entrants, and small firms, who will suffer from having fewer assets and lower cash flow.

1.32 In any case, firms are more reluctant to introduce innovations to the market during an economic downturn because it is harder to recoup costs, and even those process innovations that might lead to reduced costs in the long run are at risk of being stunted by a lack of initial capital investment and downward pressure on demand. Regional Development Agencies (RDA) Business Surveys over the past 12 months have shown that businesses in the South East have reduced innovation expenditure and that a large majority do not plan to increase it in 2010.

1.33 Clearly the downturn is having an overall negative effect on innovation, although there is (somewhat counter-intuitively) the potential for new opportunities to be created. Provided there is sufficient momentum, new players might well seize the gaps created where previously dominant firms are weakened. Since the recovery depends on innovation for sustainable growth, it is important that structural measures encourage the continuation and evolution of research and development, and ensure that barriers to entry are lowered as far as possible to encourage this kind of initiative and to maintain competitive levels of innovation. Past experiences have shown how it is possible to make the most of crises to improve innovative performance (for example, Finland and Korea in the early 1990s).

1.34 It is important to understand which technologies are the most successful in the UK and gear investment strategies towards these, rather than attempting to play catch-up with the other G7 countries in the less successful sectors. As the landscape for innovation becomes more complex and volatile, it is clear that any effective governance strategy will require co-ordination at local, regional and national levels, ensuring it is geared to operate at the most effective scale.

1.35 Innovation itself is not sufficient to generate productivity improvements, a fact easily demonstrated by the UK car industry. The fact that we dominate the world in the construction of racing cars (there is a high concentration of this activity in the South East) shows our excellence at high-tech automotive engineering. But this excellence

does not translate into the ability to use best practice in mass vehicle manufacture, even when examples of such best practice are just around the corner. Therefore, there is a weakness in translating scientific innovations into marketable and profitable products.

1.36 Innovation and translation of scientific innovations into marketable and profitable products is increasingly becoming a challenging task since globalisation has intensified competition in innovation, with a significant increase in R&D spending in BRIC (Brazil, Russia, India and China) countries. Between 1997-2007, China's expenditure on R&D as a share of GDP had increased by 0.8 percentage points to 1.44% and it is closing the gap on EU. It is likely that by 2014 expenditure on R&D in China as a proportion of GDP will be greater than the EU average. Furthermore, in absolute terms total expenditure on R&D China is the third highest in the world. The growth of R&D expenditure in China in the period 1995-2005 has been impressive, with an annual average growth rate of more than 18% (albeit from a lower base), a rate much higher than that recorded in OECD countries (almost four times greater than in the best performing OECD country, the United States). China and other major developing economies are already challenging developed economies across a range of higher value added goods and the competition in this area will most probably intensify in the future.

1.37 Over the past two decades we have witnessed a significant shift in economic activity – towards a number of high-growth economies (BRIC countries) and this trend will continue. Between 1990-2000, BRIC countries' share of global GDP growth was 32.2%, between 2000-08 it increased to 46.3% and between 2008-14 it is expected to increase to 61.3%. On the other hand, G7 contribution declined from 41.1% between 1990-2000 to 19.8% between 2000-08 and it is expected to decline to just 12.8% by 2008-14.

1.38 Almost two thirds of our exports are with Europe, and in the medium term it is the case that what happens in Europe has more impact on the South East economy than elsewhere in the world. However, since growth amongst BRIC economies alone will be a major driver in sustaining overall levels of global demand, there is an opportunity for the region in those fastest-growing export markets. This can only be achieved via growth based on innovation and quality.

1.39 The most synchronised, deepest and longest global recession since the Great Depression of the 1930s is having a significant impact on the South East and its sub-regional economies. The full impact of the recession on the region and its sub-regions is still being assessed but it is possible that the current recession could lower the long trend rate of GVA growth in the region by as much as 0.5% per annum, which could have a significant impact on prosperity across the region. Therefore, employment growth over the short to medium term, and in particular productivity growth driven by technological and non-technological innovation, will be the key determinants of regional prosperity in the years to come.

2. Current position

2.1 The South East has a strong and diverse business stock, alongside a wealth of knowledge-based resources. In terms of the drivers of productivity, for the data available the South East compares favourably to the national average and most other UK regions.

2.2 In the UK, only firms and government in the East of England spend more on R&D per unit of GDP than the South East. The South East is among the leading areas of the UK for product innovation, demonstrated by the number of patents per head of population and evidence from the Community Innovation Survey (CIS3).

2.3 The South East hosts one of the top 10 universities in the world, Oxford, and Greater South East hosts four of the world's top 10 universities (Oxford, Imperial, Cambridge, UCL). The other six are all in the US. Overall, the UK has a world-class science base, second only to the US.

2.4 However, competition from other nations is ramping up rapidly. The South East lags behind the most innovative regions of the EU (in Finland and the Netherlands) and the fastest rates of economic growth are in China and India.

2.5 In Asia, there is a strong focus on education and its growing economy is expected to reach 50% of the world total by 2030, up from 30% today. Return on investment in education is apparent in a comparison of Singapore and Jamaica. In the early 1960s, each had population of 1.6 million and approximately the same GDP per capita, US$2,200. They then diverged. Jamaica stuck to agriculture, mining and tourism, while Singapore focused on educating its people who expanded manufacturing capacity and developed advanced technology. Today, Singapore's GDP per capita is US$39,000, more than seven times that of Jamaica.

2.6 However, the decline in undergraduates studying STEM (Science, Technology, Engineering and Mathematics) subjects, as shown in Figure 4, is adversely affecting the UK's competitive potential in the face of increasing global competition.

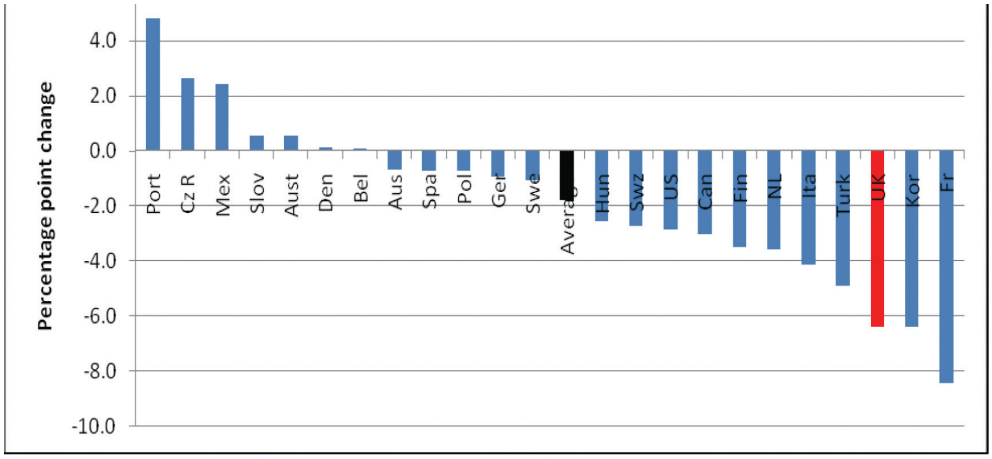

Figure 4. Changes in STEM undergraduates 2000 - 2006

3. Current Regional Strategy

3.1 The vision of the Regional Economic Strategy (RES) 2006-2016 is for the South East "to be a world-class region achieving sustainable prosperity".

3.2 There are two targets in the RES directly relevant to innovation, the first relates to Knowledge Transfer and Business Expenditure on Research and Development - increase the proportion of businesses in the South East reporting R&D links with

universities from 11% in 2005 to 15% by 2016, and increase business expenditure on research and development in the South East from 3.2% of Gross Value Added in 2003 to 4% by 2016). The second target refers to Innovation and Creativity - increase the percentage of total South East business turnover attributable to new products from 12% in 2004 to 20% by 2016, and the percentage attributable to significantly improved products from 18% in 2004 to 25% by 2016).

3.3 In addition, there is a transformational action regarding Science and Innovation Campuses. This commits SEEDA to work with businesses, universities, public sector research establishments, other leading research institutions and central government departments to encourage and stimulate the establishment of at least two new Science and Innovation Campuses in the region, drawing together all of the elements needed to maximise the economic and social benefits of the region's world-class science, engineering and technology base and business strengths.

3.4 The South East Science, Engineering and Technology Advisory Council (SESETAC) advises on how science and innovation can drive up South East business performance. Membership includes leaders from business, academia and the public sector.

3.5 SEEDA has invested in innovation since its earliest days. In 2003, however, there was a step-change in SEEDA's innovation support in response to the Lambert Review of University-Business Collaboration, resulting in greater investment strongly steered by SESETAC. Investment for innovation support has increased from just over £1 million in 2001-02 to over £28 million in 2008-09.

3.6 As a result, SEEDA now offers a powerful, integrated innovation programme, which is responsive to the South East's distinctive characteristics whilst remaining firmly aligned with national policies.

3.7 Developed by SESETAC, the South East Strategy for Technology (S4T):

- Identifies interventions which will increase the global competitiveness of the South East, with clear criteria and evidence-based guidance upon which to base investment decisions
- Is consistent with the region's sectoral focus and technology priorities
- Responds to and informs alignment with national priorities
- Encourages opportunities for cross-regional collaboration.

3.8 As well as implementing the RES, S4T enables the South East to play its part in achieving the national vision for the UK to be "a global leader in innovation and a magnet for innovative businesses, where technology is applied rapidly, effectively and sustainably to create wealth and enhance quality of life" .

3.9 Based on analysis of regional strengths and market opportunities, SEEDA proactively encourages activity in four key pillars of technology activity, each with potential to bring economic benefit to the region:

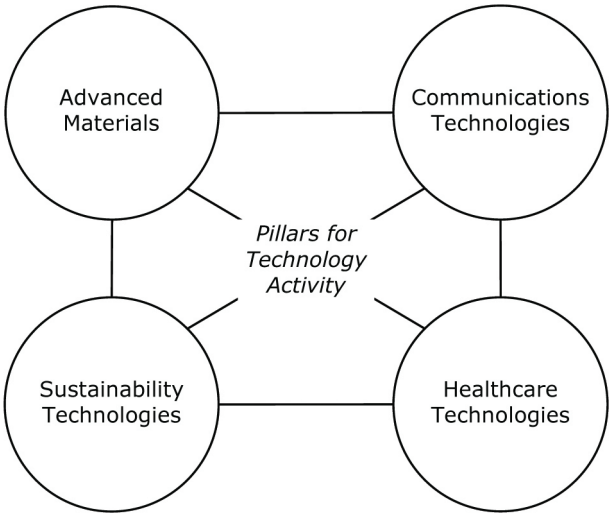

Figure 5. Four pillars of technology activity

3.10 The region is unique within the UK in having outstanding business and knowledge-base strengths across a comprehensive technology base, and is particularly well-placed to promote open and interdisciplinary innovation. S4T embraces the strong case for focusing interventions on key priority technologies and sectors, but also acknowledges the strengths of a diverse and flexible economy. SEEDA will therefore take a responsive and flexible approach to changing economic circumstances, supporting technology projects from any sector that potentially have a significant positive impact on competitiveness, sustainable economic growth and quality of life on the South East of England.

3.11 S4T aims to influence future Technology Strategy Board (TSB) activities for maximum benefit for the UK and the region. SEEDA has aligned nearly £30 million of funding with the National Technology Strategy over 2008-11, targeting TSB activities that are of particular importance to the South East to leverage funding into the region and maximise the added value of its investment.

3.12 SEEDA funds the seven core innovation support products, namely:

1. **Networking for Innovation**
2. **Innovation Vouchers**
3. **Knowledge Transfer Partnerships**
4. **Collaborative Research & Development**
5. **Grant for Research and Development**
6. **Innovation Advice and Guidance**
7. **Designing Demand.**

3.13 In addition, SEEDA also supports innovation through Manufacturing Advisory Service, Coaching for High Growth, Business Collaboration Networks, start up, finance and skills support.

3.14 The South East Innovation and Growth Teams are eight sub-regional partnerships developed to support high growth, innovative companies. The involvement of local partners (private, public and academic) is a key feature of the programme that supports the most effective use of the funding available.

3.15 The three Science and Innovation Campuses are the major programmes of innovation infrastructure in the South East. These are:

- Harwell Science and Innovation Campus - an internationally renowned centre of excellence for advanced materials that supports collaborative work with the space industry in the South East
- Dartford Campus of the Institute for Sustainability - undertaking research, development and demonstration activities, sharing and accessing best international practice and helping create a world-leading eco-region in the Thames Gateway
- A third campus focused on communications is under development and will build on the South East's academic and business strengths in communication technologies. The first application being developed is telecare, the use of information and communication and sensor technologies to deliver health and social support to people to help them live as independently as possible.

3.16 RDA support for science and innovation has been shown to be effective with each £1 million of RDA spend resulting in £8 million added to the regional economies, which has been achieved through working with local partners. RDAs will also work with local authorities to develop new opportunities to use public procurement to support innovation.

4. Government targets

4.1 As stated in the Innovation Nation White Paper, the Government's objective is to ensure that Britain is the best place in the world to run an innovative business or service.

4.2 The Government expects RDAs to recognise the role of innovation and technology as a key driver of economic growth and prosperity in the new regional strategies.

4.3 RDAs are expected to continue working with the Technology Strategy Board to align programmes and priorities, with the aim of meeting the Sainsbury Review commitment to align £180 million over the period 2008-2011.

4.4 RDAs have the lead responsibility for strengthening the regional innovation infrastructure, developing strategies and bringing together partnerships to deliver and lead activities that develop the innovation capacity for industries in their regions using their influence and resources.

4.5 RDAs should work together to identify the key areas of expertise and excellence in the regions that support the New Industry New Jobs sectors. These priorities should consider the varying markets and geographies within a region. Where local authorities have come together in sub-regional partnerships, particularly in large city regions, RDAs should work with these partnerships to articulate any key sub-regional innovation markets and strengths.

4.6 RDAs will also continue to work with local partners on the delivery of innovation support. Local bodies are uniquely placed to provide intelligence on local opportunities and need to target innovation support within the context of the region.

4.7 RDAs should continue to develop opportunities for using procurement to drive innovation, for instance, through the SBRI (Small Business Research Initiative) scheme.

4.8 At the local level, local authorities and smaller sub-regions have an important role, particularly through strategic decisions, on planning and investment for infrastructure to support regional innovation priorities.

4.9 Local authorities can also drive innovation through their roles as procurers and service providers. The Government is encouraging groups of local authorities to use innovative procurement mechanisms, such as Forward Commitment Procurement and the SBRI, supported by guidance from the Office of Government Commerce. Local authorities can also play a strong leadership role in encouraging other local public service providers to be more innovative.

5. Relationship of this Think Piece to the other five think-pieces

5.1 Innovation, and particularly technological innovation, has the potential to address the challenges discussed in the other five Think Pieces and to drive economic growth in the process.

5.2 For instance, in the UK, South East England is likely to feel the impact of climate change first in terms of becoming drier and warmer. Again, we should look to our natural resources to assist us, particularly the sea. Desalination could offer a plentiful supply of water in the region. Some systems currently operated in hot countries make use of solar technology, which makes desalination cost-effective. In the UK, the same water purification process could be powered by coupling with a renewable energy source, such as marine power.

5.3 With regard to the ageing population, new sensor technology that underpins personalised monitors and which can be worn at home will autonomously and regularly monitor a variety of individual health functions and relay, through wireless connectivity, the results back to the control centre of a healthcare provider. When issues of concern are triggered, pre-planned responses by the healthcare provider can be activated, some of which may also be delivered by distance telecare.

5.4 The South East shares the national target of building more homes including affordable housing. Improving housing affordability needs to look beyond the initial project of constructing the house and to include measures that ensure affordability of living in the house over the years, the through life costing of the house. It should also address the related aspect of more people wishing to work at home, contributing to reductions in carbon emissions but totally dependent on fast broadband connectivity and thus the need to have this built in from the start with the ability to upgrade.

5.5 Energy costs are set to rise rapidly over the next period. As water becomes scarce utility bills will rise and local authority rates will also rise to meet carbon reduction targets. All these factors emphasise the need to build into houses from the start features including:

- Microgeneration facilities for the household's energy usage and grid connectivity for uploading excess supply

- Smart metering of water and energy so that households can adapt their usage including to off-peak times, when mains supplies are perhaps provided from renewable sources
- Eco-friendly building design covering insulation techniques, building materials including glass windows, water re-cycling and biomass/waste storage for recycling.

6. Challenges and tensions

The future of the South East economy

6.1 Following the worst recession in living memory, over the short to medium term one of the key issues will be to support business start-up/survival and create employment opportunities for all.

6.2 Narrowing the productivity gap with London and other advanced regional economies across the world is a key issue for sustainable economic growth.

6.3 Spatial disparity in skills, income and economic performance is another major issue in the South East and addressing these disparities will be one of the most important policy issues in the region over the medium to long term. Dealing with labour supply constraints resulting from the ageing population and slower population growth is another factor that will determine the rate of growth over the longer term

6.4 The sectors that will drive economic growth in the future may not be the same as those which have done so in the past.

Technological innovation

6.5 The evidence shows that we have a significant gap in innovation inputs, such as R&D expenditure, compared with our major competitors.

6.6 Furthermore, a number of innovation output indicators also point towards a significant gap between the region and other advanced global regions. A lower proportion of turnover in the South East and the UK is accounted for by novel or improved goods and services when compared to our main competitors. This is one of the factors that helps to explain our poor productivity performance.

6.7 In an advanced service economy such as the South East, non-technological innovation is an important driver of growth and it is an area that has received a lot of attention from academia and policymakers over the past decade. Services account for almost 80% of South East output (GVA) and poor innovation in services is one area that helps to explain the productivity gap with our main competitors.

6.8 Some of the main challenges and tensions faced by the region and the UK include:

- **Low strategic priority for innovation** - Lack of strategic commitment to innovation particularly among many large quoted companies. Lack of ambition and appreciation of the need to keep up with technological change by many SMEs
- **Internal resource constraints** - Inability/failure to invest sufficiently in R&D, workforce skills and in-house technological capability

- **Management and organisation** - Failure on behalf of many companies to adopt up-to-date business best practice and state-of-the-art product and process technology
- **Highly innovative and fast growing SMEs** - More likely to encounter difficulties in raising finance than other firms.
- **Skills gap** - Shortage of well-educated and trained technicians and craftsman, deficiencies in the education and training of many managers and a lack of business training of qualified scientists and engineers constrain the innovation options of many businesses.
- **Rapid growth in the stock of scientific and technological knowledge** - This provides scope to apply advanced technology to every aspect of economic and social life, including many sectors currently regarded as medium or low technology. However, successful adoption of novel and/or advanced technology frequently requires significant changes to the organisation, business processes, human resources and strategies of firms.
- **Better exploitation of the strengths of the UK science base** - Business often fails to exploit outputs from the scientific research base. The main reason for this is weaknesses in the overall innovation performance of UK business but a contributory factor is patchiness in the links between knowledge-base and business.

7. Key areas for the Regional Strategy

7.1 The spatial aspects of innovation will be given more attention than ever before and highlight the complexity of these elements.

7.2 The balance between innovation for economic growth and global competitiveness versus regeneration or quality of life or environmental improvement.

7.3 The balance between economic growth built on absorptive capacity and investment in the research base.

7.4 Developing the skills in the South East for the region's future global competitiveness.

7.5 Local authorities can also drive innovation through their roles as procurers and service providers. They can also play a strong leadership role in encouraging other local public service providers to be more innovative.

8. Implications and questions

8.1 This analysis raises the following key questions for consideration at this early stage of developing the Regional Strategy:

On delivering economic growth:

- Does the impact of the recession require us to reconsider our existing economic development and spatial strategy?
- Which sectors and places can most effectively drive economic growth in the future?
- How do we rise to the challenge of global competition?

- What is the role of intervention in each of the five drivers of productivity (skills, investment, innovation, enterprise and competition) in ensuring the South East remains globally competitive?

On technological innovation:

- **The geography of innovation is complex and no single spatial level is best for analysis**
  - Innovation can be defined at many levels, from local and sub-regional, through regional, pan-regional and national, to the European and global levels. All of these levels are relevant and no single spatial unit predominates.
  - A particular manifestation of this question for the South East is around the region's dependence on London.

- **Is publicly funded support for innovation predominately for economic growth? Or should it be driven by improving quality of life or the environment?**
  - Technological innovation has driven many improvements in quality of life and the environment, yet public perception often focuses on downsides
  - These spillovers from innovation are often unforeseen yet are critical to the justification of public intervention
  - Conversely, a more deliberate attempt to support such benefits may reduce the benefits realised.

- **Should the South East 'make' or 'buy' innovation?**
  - The South East has a global strength in academic research, however this sometimes masks the strength of the absorptive capacity in the region's businesses
  - Perhaps more than any other region, the question of the importance of the knowledge-base in innovation is important to resolve.

- **How can the South East ensure that it has the skills base to compete globally?**
  - A recurring theme is the importance of skills to the competitiveness of the South East
  - However, unpicking this is a challenge with different evidence for a variety of gaps (for example, STEM, high level, creativity, leadership, technical skills)
  - There is a new mechanism in the regional skills strategy but can it deliver the skills for innovation that are needed?

- **How can local authorities use their procurement of public services to drive innovation?**
  - The relaunched SBRI scheme has been used to drive innovation – can this be used more widely?
  - Is this activity best handled by groups of local authorities working together?

Contributions

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