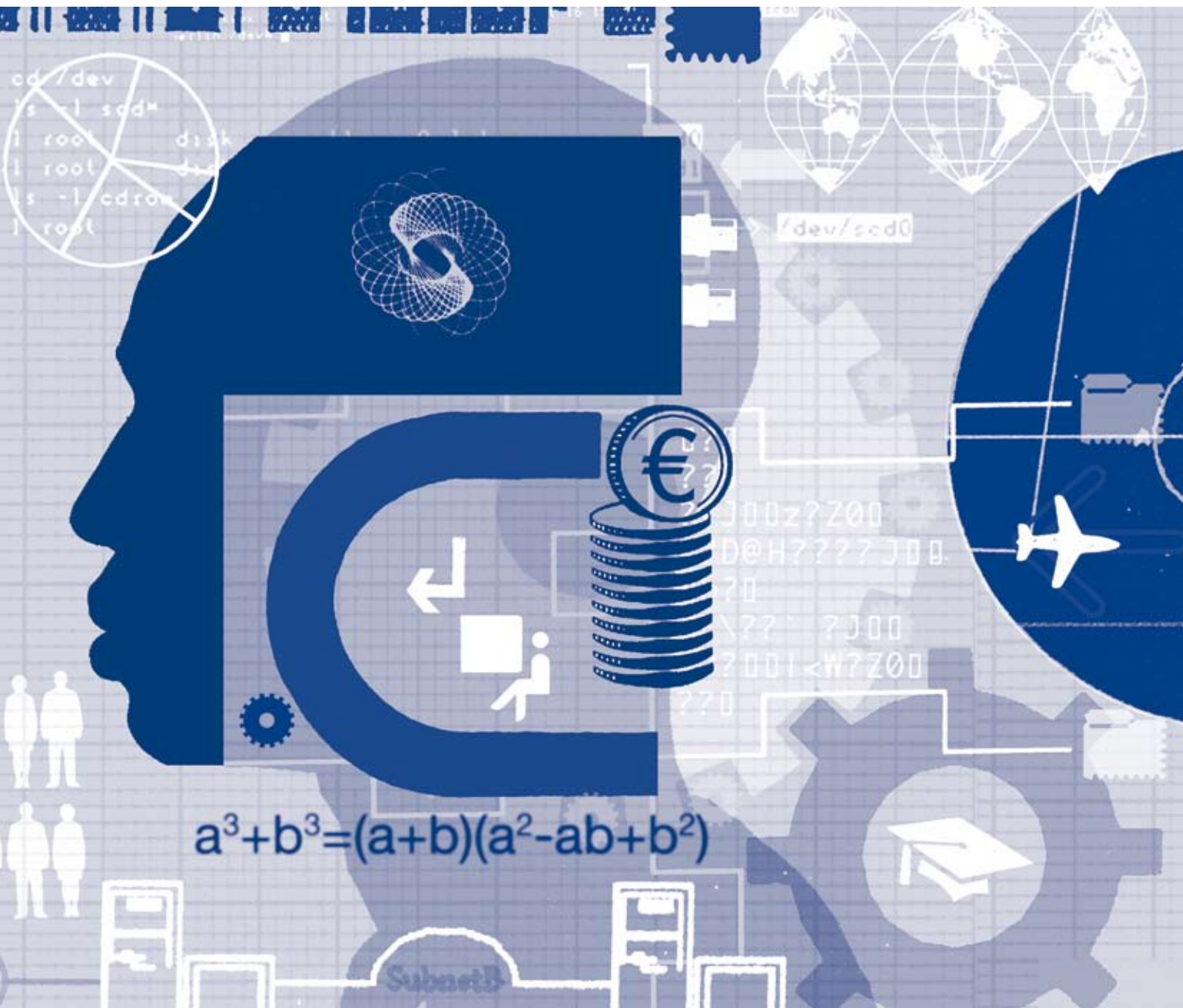


# Innovation, Creativity and Entrepreneurship in 2020



## A Work Foundation statement

Prepared by Ian Brinkley



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## Acknowledgement

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# 1. Introduction

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By 2020 the UK must create a balanced and sustainable knowledge economy. There is no other option.

For a decade up to Northern Rock's collapse in September 2007, Britain relied on financial services, property and construction to power its economic and employment growth – with the remaining jobs largely supplied by a public sector whose tax revenues were buoyed up by the bubble economy. In 2010 as we emerge from one of the most severe economic crises of the last century, it is clear that the balance of the economy must change. There are no more easy pickings off the back of a credit boom. Britain is going to have to self-consciously create a national innovation ecosystem to drive new growth sectors and companies. Successful companies will be those who innovate products and processes, so creating new markets and reputations for themselves.

New ways of intervention will have to be found. New public spending commitments or tax concessions – the traditional ways of achieving public policy goals – are going to be extremely constrained by the necessity to reduce Britain's budgetary deficit. The quest is on for policy levers than can deliver changed behaviour as effectively but more cheaply. Here 'behavioural economics', 'which delves into the social, psychological and non-materialistic motivations for human behaviour', has some rich insights.

Behavioural economists argue, for example, that the physical architecture, look and feel of goods and services can determine how they are used as much as their price – and it is this thinking, so-called 'nudge economics', that is opening up important understanding of how organisations really tick and how an innovation ecosystem could be developed. For example, the OECD has found that regulation and legal protections can, in the right circumstances, promote positive attitudes to new technologies and acceptance of ICT innovations by improving confidence in privacy, security, and consumer protection.<sup>1</sup> Improvements in this area could have major economic benefits for both domestic growth and exports. Firms in the UK already have one of the highest rates of internet sales in the OECD as a share of total sales, and the UK in 2007 was one of the biggest exporters of ICT services.<sup>2</sup>

Britain's challenge is to rebuild its economic model around investment and innovation with little direct public money. Solutions must be low cost. Consolidation of existing institutions and the redirection of scarce resources towards clear priorities is essential. The creation of some new public based institutions may be necessary, but their primary purpose must be to unlock private long term capital, facilitate the growth of market based activities, and drive forward public service innovation.

This challenge is shared across the industrialised west, where the knowledge economy has become the great engine of growth. For more than a generation the number of jobs that require degree level or professional skills has steadily risen, while the companies and sectors that have grown are those that one way or another are smart and add value. Knowledge intensive industries range from information and communication technologies to advertising and from universities and hospitals to building aero engines. Over half our value added and employment is now generated within these sectors as defined by the Paris based club of government economic forecasters, the OECD.

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### The knowledge economy

This in turn has been driven by three massive changes in the way economies work and how organisations within them operate:

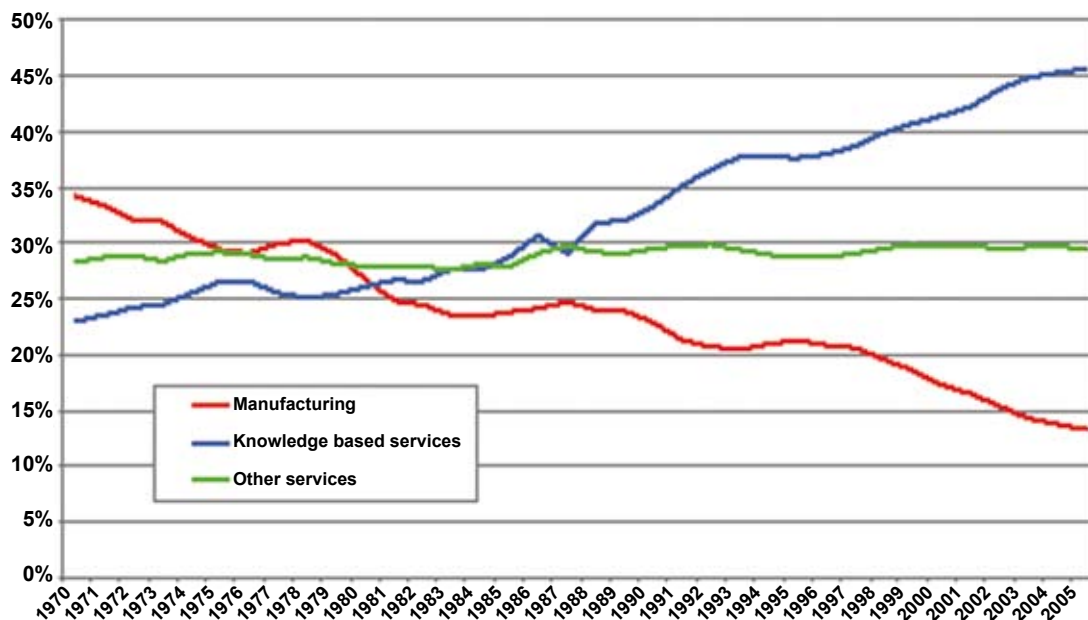
- The rise of knowledge and technology intensive jobs and economic activity;
- Investment in knowledge based assets or 'intangibles';
- Increasing well qualified and educated workforces.

The primary driver is rising demand for high value added services and goods from wealthier, more sophisticated, diverse, and demanding consumers. The great enablers are powerful and cheap computers and the 'general purpose' information and communication technologies coupled with mass higher education. The accelerator on both the demand and supply side has been globalisation, creating markets of scale and also diversity and facilitating the flow of ideas, concepts, technologies, capital and people.

Across the OECD, the number of people working in knowledge intensive and technologically advanced industries grew from 50 million to 150 million between 1970 and 2005.<sup>3</sup> In the UK, the share of people working in knowledge intensive services alone stands at 45 per cent compared with 24 per cent in 1970. These industries have been the big drivers behind jobs and value added as shown in Figure 1 on the next page.

Across all sectors, organisations have invested massively in knowledge based intangibles. In 1970, UK business investment alone in knowledge based intangibles such as software, design, brand equity, R&D, human and organisational capital was worth 40 per cent of investment in physical infrastructure such as buildings, machines and equipment, and vehicles. In 2004 it was worth nearly 120 per cent, or nearly £130 billion.<sup>4</sup> These figures are for the business sector – they would be even higher including the public and other non-market sectors. The UK public sector could invest another £29 billion in intangible assets, for example.<sup>5</sup> We see a similar story across the OECD – in the US, Finland, France, Germany and Japan. This is shown in Figure 2 below. Overall, the UK is a world leader in investment in intangibles.

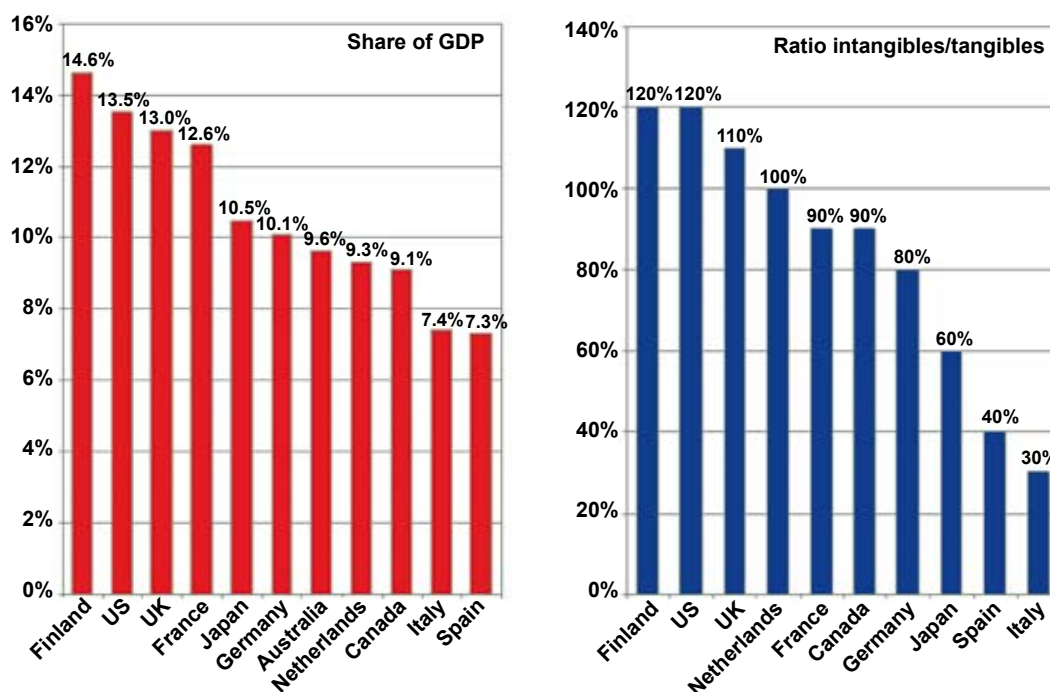
**Figure 1: Economy restructures towards knowledge based services 1970-2005 – share of value added**



Source: EU KLEMS database

**Note:** Knowledge based services based on OECD definitions includes communications, financial services, business services, education and health. All other services includes retail, hospitality, transport, public administration and other community, social and personal services. Manufacturing includes both knowledge based and other sectors.

**Figure 2: Business investment in intangible knowledge based assets across the OECD**

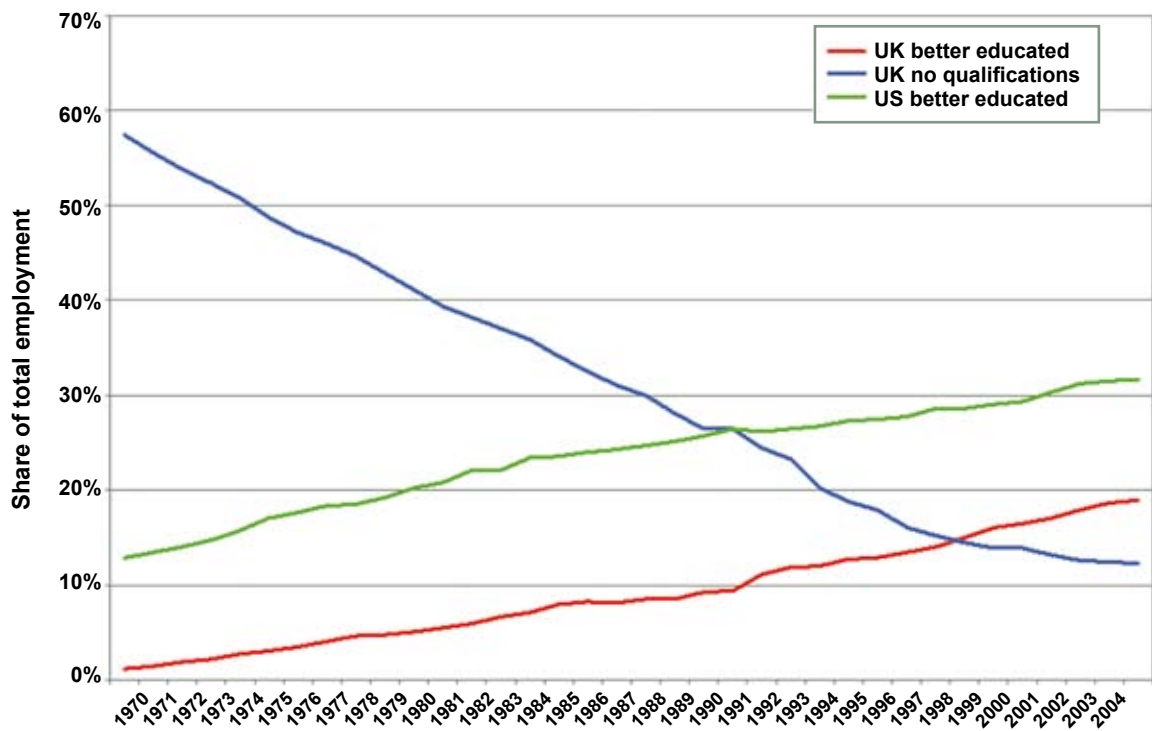


Source: Australian Productivity Council 2009

**Note:** All figures share of market sector GDP. Finland excludes financial sector, US excludes farming. US average of 1998-2000; UK, Germany, France, Italy, Spain are 2004; Japan average of 2000-2005; Netherlands and Canada 2005.

Hard though it is to imagine today, but in 1970 the vast majority of people in work had no qualifications and degrees were for a tiny elite. Within a generation we have moved to a workforce where absence of qualifications is unusual and up to a third have a degree or equivalent.<sup>6</sup> By 2020 around half of all jobs will be in the top three occupational categories of managerial, professional, and associate professional and technical.<sup>7</sup>

**Figure 3: Rise of the educated and qualified workforce 1970-2005**



Source: EU KLEMS database

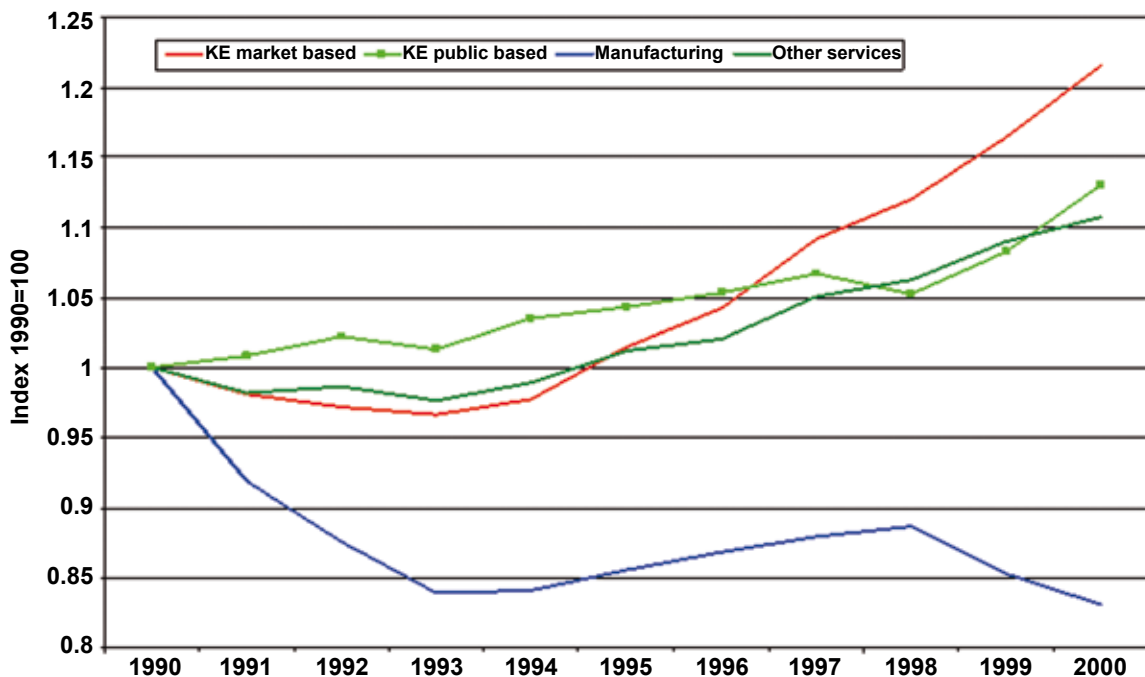
**Note:** UK, share of total workforce with degree or equivalent (better educated) and share with just basic schooling.

## 2. The 2020 knowledge economy

The 2020 knowledge economy will have reconciled two potentially huge challenges. One is to expand the knowledge intensive sectors of the economy quickly enough to move the economy as a whole back to full employment and provide new sources of innovation, growth and exports. The second is to prevent that expansion creating greater social and economic divides, with the workforce polarising between those in relatively well paid, secure knowledge related jobs and those in poorly paid, lower skill jobs.

The first challenge requires a relentless focus on what areas of the economy can grow and create jobs. The knowledge based sectors led the recoveries from the 1980s and 1990s recessions. Between 1991 and 1998 private sector based knowledge services produced nearly 1 million new employee jobs, with over 600,000 coming from high tech and other business services.<sup>8</sup> They will do so in this recovery.

**Figure 4: Knowledge economy and 1990s recession and recovery**



Source: EU KLEMS database

**Note:** Total employment, EU KLEMS database 1990=100. KE market based is telecoms, high tech, business, financial and cultural services; KE public based is education and health care

The challenge is even greater over the next decade because we will be even *more* dependent on job growth from market based knowledge services over the next ten years. There will be no overall growth in taxpayer funded education and health care services. Even in the good times, financial services contributed few if any new jobs. The boom in property market related jobs will also not be repeated. Jobs will also be created in less knowledge intensive sectors, but in areas such as retail the growth will be more modest than in the past as on-line shopping increases.<sup>9</sup>

Knowledge economies do not respect conventional industrial boundaries. We need to think less about specific industries and more about groups of activities with a single unifying theme that cut across conventional industrial boundaries. Within each group individual industries and sub-industries will rise and fall – as they always have done in a dynamic economy. But overall the 2020 economy will see a rising share of economic activity, innovation, exports and jobs across four broad areas:

- The ‘manu-services’ sector which integrates technologically advanced manufacturing with high value services;
- Low carbon goods and services, including the implementation of existing technologies, the expansion of advanced manufacturing processes, and the development of new and existing services;
- The creative and cultural sector bound together through ‘expressive value’ or copyrightable activity;
- High tech and high value added networked and intermediary services.

The last grouping reflects two related changes. One is the rise of specialist intermediary agencies from design to advertising to market research to consultancy to computer services and labour supply agencies.<sup>10</sup> The second is the shift towards less transactional to collaborative business models, with the formation of networks of SMEs co-ordinated and supported by large companies in areas such as advanced manufacturing and high tech services. The Confederation of British Industry (CBI) describes the development over the next decade of a ‘core plus periphery’ business model based on more collaborative working with a range of partners in both the public and private sectors.<sup>11</sup>

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### **Towards a 2020 innovation system**

By 2020 the UK will have developed a comprehensive innovation system building on the solid foundations of today, including the evidence base created through the work of BIS (Business Innovation and Skills Department and predecessor Departments dealing with innovation policy) and bodies such as the National Endowment for Science, Technology, and the Arts (NESTA). It will be built into the priorities for every Whitehall department and public agency and cover all



sectors of the economy. It will be as firmly anchored in the creative and cultural sectors as it is in the science and technology base.

The innovation system will put as much emphasis on setting the right frameworks and use regulation, planning, and other non-fiscal mechanisms. A central but not exclusive focus will be on our four key growth activity groups – manu-services, low carbon, cultural and creative and high tech and business intermediaries.

This cross sectoral approach reflects one of the fundamental pillars of a knowledge based economy, the £130 billion investment in knowledge based intangible assets. Few people appreciate that the modern manu-services sector invests twice as much in such assets as it does in factories, vehicles and machines.<sup>12</sup> This is a much higher ratio than in the service sector. It must follow that the strength and relevance of institutions, systems, standards, regulations and intermediaries, and public support and policy interventions that influence the quality, cost, and availability of such assets will be as important as the more traditional focus on support for physical investment.

The 2020 innovation system will reflect the faster introduction of ‘general purpose technologies’ or GPTs. These all have their roots in technology, but can be technologically advanced products, processes (such as lean production) or services. Like electricity, the internal combustion engine, or the internet, general purpose technologies have the power to change the organisation and structure of whole economies and not just particular industries.

Some definitions identify between eight and ten general purpose technologies in the 20<sup>th</sup> century compared with up to five in the preceding 150 years. We can expect many more in the 21<sup>st</sup> century.<sup>13</sup> One reason for the speeding up is that innovation stands on the shoulders of the stock of scientific and technological knowledge and that stock is expanding very rapidly across the globe – so rapidly that simply keeping pace with what is genuinely new in the world is a major challenge. Inventions in particular areas can happen very quickly after an initial breakthrough – including rediscoveries of processes that could not be furthered at the time because they depended on other discoveries.

The innovation system will help the 2020 economy rise to a series of major engineering challenges from the practical application of nano-technology and fusion power, carbon sequestration, health informatics and customised medicines, to cyberspace security and enhanced virtual reality to personalised learning.<sup>14</sup> Some organisations refer to ‘enabling technologies’ that cut across conventional research boundaries through combined innovations in, say, optical, chemical and biological applications in areas such as health care.<sup>15</sup> In the UK,

the Technology Strategy Board and other public bodies are pioneering centres of excellence – Innovation and Knowledge Centres – in universities to help business develop and exploit emerging technologies.<sup>16</sup>

The OECD identifies five new science and technology growth areas for the future – health, electronic communications, environment, bio-tech and nano-technology.<sup>17</sup> The UK's positioning is mixed – strong in some areas such as health related science and telecommunications and in others showing old weaknesses have not been fully addressed. For example, in environmental science the UK is at the forefront of scientific citations, but lags in terms of patents for environmental technologies. By one measure, the UK now lags Brazil in terms of technological advantage in related nano-technologies as well as other major OECD economies.<sup>18</sup>

Many of these will still be challenges in 2020 – even with a speeding up of the invention and innovation process there are still big lags between breakthrough and economy wide applications.<sup>19</sup> And some may still be beyond our technological abilities until well into the second half of the century.<sup>20</sup> These long lead times make it all the more important to lay down the basic foundations now so that we are well placed to take advantage of whatever emerges as the next break-through in general purpose technology.

If the pace of the innovation system is speeding up, so too is the 'creative destruction' of the knowledge based economy. One estimate by McKinsey put the average lifetime of a company on the Standard and Poor top 500 database at 45 years in 1955. Today it is 11 years. Resources, talent, creativity, knowledge and capital are being brought together and broken apart at an accelerating pace. Innovation systems need to help facilitate rather than hinder so that more new, shorter-life organisations burn more brightly.

By implication both external and internal labour markets must become even more mobile. The implication is that mobility across occupations and industry must rise to ensure that people at all income levels can move as easily as possible from declining occupations, industries, and sometimes localities to growing jobs, industries, and areas. Too often, this is the preserve of the best educated and most well resourced.

But much of the adjustment to change takes place within enterprises and organisations in both the public and private sectors and creating the right conditions for flexible and innovative adjustment internally is critically important. Our work tells us that many of those in the most knowledge intensive jobs face command and control regimes and feel their skills are poorly used. At the opposite extreme, progressive firms promote the idea of 'intrapreneurs' who are given the freedom to innovate, experiment and develop within the resources and systems of

big firms.<sup>21</sup> We need less of the former and more of the latter. The primary responsibility for the changes to bring this about lies with both public and private sector organisations, but where possible an innovations system should be supportive.

The innovation system must also be as capable of responding to innovation in services and the changes in consumer tastes and preferences that provide one of the key underlying drivers towards a knowledge economy. Many are familiar with the growth of personalised goods and services, but some have identified a trend to 'experiential' services where part of the package is the 'experience' felt by the individual.<sup>22</sup> Just as the industrial boundaries become porous in a knowledge based economy, it will become less relevant to think of service innovation, product innovation, and technological innovation taking place in different boxes. Increasingly, they will take place simultaneously and be driven as much by manufacturing as service based firms and by users as much as by producers.

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### Benchmarking the knowledge economy

NESTA has recently published a useful summary of how the UK innovation system currently stands compared with the rest of the OECD as part of the development of an innovation index for BIS.<sup>23</sup> This shows the UK does well on competition and entrepreneurship, has a mixed performance on public research and openness to new ideas, and does less well in supporting demand for innovation, access to finance, and skills. We need to extend this concept and look at how well the UK is performing on a wider range of knowledge economy indicators both for the economy as a whole and for groups of activities.

The UK statistical authorities have already proved innovative in their approach to intangibles, but this interest needs to be consolidated and prioritised, otherwise the measures we have will soon be hopelessly out of date. Estimates of what OECD economies are investing in intangibles currently depends on a mix of academic and semi-official studies. The UK's figures are for 2004, those for the US are at least a decade out of date.

Benchmarking must also take into account the complexities of modern knowledge based economies. For example, focusing just on the physical output and exports of manufactured goods from the UK fails to capture the true importance of advanced manufacturing in the economy. Even more importantly, too narrow a focus will fail to recognise that the high value added services generated by manufacturing are dependent on retaining high value advanced manufacturing capacity in the UK. It is impossible to have one without the other.

The 2020 innovation system will be built around the following components:

- Knowledge creation and diffusion;
- Selection and dissemination of research;
- Productive entrepreneurship;
- Market formation;
- Human capital development;
- Financing the productive economy.

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**Knowledge  
creation,  
development  
and  
dissemination**

The 2020 economy will have seen the UK consolidate its position as a lead economy in investing in intangible knowledge assets by the private sector. It will have strong lead strategic institutions both on the science side such as the Technology Strategy Board and the creative side such as the Design Council working with relevant trade associations. It will have developed a 'total innovation' approach at the city-region level to complement the current focus of regional development.

It will have reformed systems of support for private R&D to make them competitive, flexible, and agile and more supportive of industry-university linkages. The public funded science and technology base will have benefitted from consistent high rates of investment and a relentless focus on areas of relative strength and excellence. It will have a robust higher education system focused on centres of excellence in sciences and the arts.

The UK currently does well overall in intangible knowledge investment – as a proxy measure for investment in innovation as a whole.<sup>24</sup> But on other measures such as R&D, it is well behind the world leaders today such as the Nordics, North America and OECD Asia.

The R&D tax credit is helpful for private investment, but may not be the most generous or flexible – especially in the light of increasing competition from both OECD and non-OECD economies for future R&D investment. The system needs to be urgently reassessed to make sure it is both competitive and sufficiently flexible as part of a wider package of incentives to retain high value R&D and related activities here. The effective value of R&D tax credits in the UK for large firms is less generous than in some OECD economies such as France and Japan and also most of the BRIC (Brazil, Russia, India and China) economies, according to the OECD.<sup>25</sup> Tax credits in some other economies offer a significantly higher rate for industry funded university research, potentially strengthening the interaction between universities and firms.<sup>26</sup> But tax credit generosity and structure is only one factor – some OECD economies which invest heavily in R&D such as Germany, Sweden, and the United States offer very low or no tax credits. Understanding the whole package of support and intervention (both fiscal and non fiscal) is vital if we are to remain competitive in retaining high value R&D activity in the UK.

Institutions are an important part of the landscape but we must not confuse quantity with effectiveness. Indeed, the innovation system is cluttered with institutions, as new initiatives and strategies add to what is already there rather than consolidate and narrow on to the demonstrably successful. The current review of the innovation system by Herman Hauser looking at what lessons can be learnt from the successful German 'Fraunhofer' institutions that act as intermediaries between research labs and industry is welcome.

The 2020 knowledge economy will remain centred on the big cities and other urban centres. The success or failure of innovation systems in practice will be partly determined by how successful cities are in delivering the strong skills base and addressing infrastructure needs required by knowledge business and making best use of innovation assets such as research based universities.

Other European and North American countries see their cities as high value, wealth-creating assets critical to securing increases in national productivity. In England, investment in the core cities – and their city regions – has not been prioritised by government and its agencies. As a result, most English cities are in less competitive locations than many others in the OECD.<sup>27</sup> By 2020 this gap must be eliminated and we propose the following strategic actions all focused on the city-region (the 'core cities' and their local partners):

- Accelerating innovation in the private and public sectors based on developing the institutional base from current Science Cities, City Region Innovation Panels, and joint investment programmes between city regions;
- Accelerating individual and employer demand for skills and learning by devolving responsibility for delivering adult skills provision to City Region Employment and Skills Boards in partnership with large local employers;
- Ten year agreements on key public transport network improvements, energy and water provision – including how they are to be financed – as part of the transition to a low carbon economy;
- A new financial settlement to reduce local dependence on central grants to fund major developments to be established through a task force including the Audit Commission, HMT, and central government to report in time for the next Spending Review.

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### **Productive entrepreneurship**

In the 2020 economy, productive entrepreneurship will be recognised and celebrated. It will be encouraged by a much tougher competition policy that makes growth through innovation the chosen route rather than merger and acquisition. Institutional structures will have been established to provide long term capital for firms advancing into new areas such as low carbon,

making better use of existing technologies, or transforming creative and cultural value into new commercially exploitable products and services including investment in brand equity.

The fundamental underpinning of a successful innovation system is to encourage competition. The evidence suggests that mergers and acquisitions seldom lead to more successful enterprises. Competition policy requires a stronger public interest element, which recognises that the biggest gains to society come from firms operating in competitive markets and securing growth and value from their ability to develop new products and services better than their rivals. If sufficiently robust measures could be developed, competition authorities might apply a specific 'innovation test' to mergers.

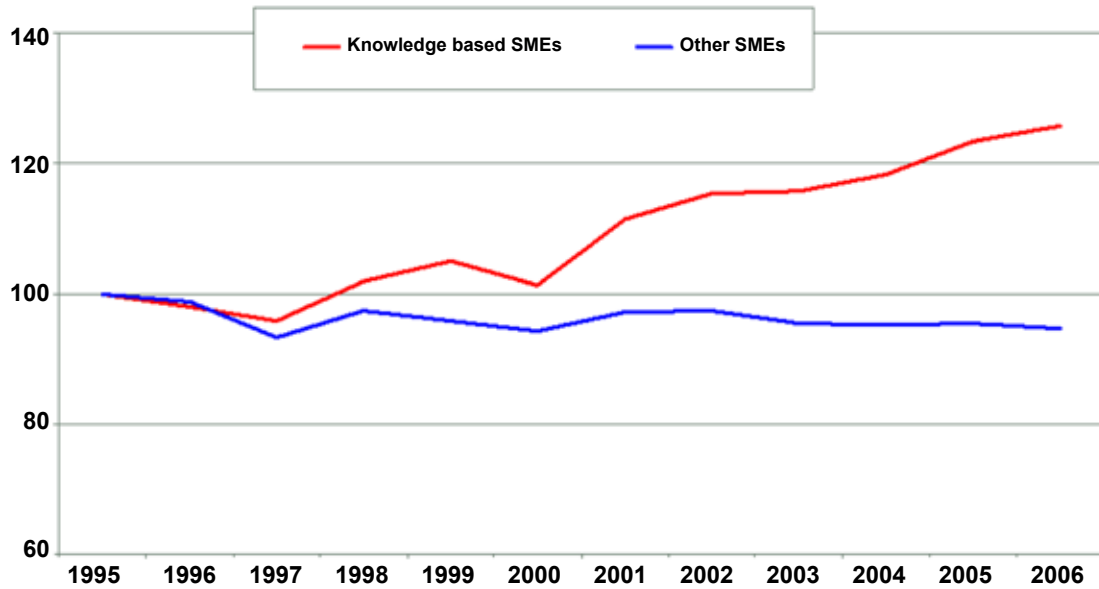
The implementation of competition policy must also be alive to the inevitable trade-offs between promoting competition and protecting the rewards firms need if innovation is to be worthwhile in new technologies, products and a wide range of copy-rightable creative activity. Collaboration between patent holders can look anti-competitive but can also promote innovation.<sup>28</sup>

Both large and small firms can benefit from more imaginative use of public procurement to encourage innovation over the long run – often also the most sustainable route to securing value for money and higher efficiency. This must be backed by the use of open innovation systems throughout the public sector.<sup>29</sup> The Design Council has pioneered such approaches in areas such as the NHS to show how good design can deliver better services at lower cost and open up markets for innovative UK firms.

The UK has a good record on high growth SMEs, second only to the US.<sup>30 31</sup> The Work Foundation's research shows that over the past decade all the net growth in employment directly attributable to SMEs came from the knowledge based sectors<sup>32</sup>, see Figure 5 on the next page.

Enterprise policy must have two clear priorities. One is to make sure that innovative, growing enterprises have the capital they need on the right terms. A particular concern is for enterprises who find conventional venture capital too costly and the current range of financial institutions too cautious. As well as high tech companies meeting the new engineering challenge outlined earlier, new creative enterprises and those developing new and innovative services across the knowledge economy will all need capital. Local authorities have often proved to be at the forefront of innovation in their willingness to intervene in local economies – another compelling reason to develop the 'total innovation' concept at the city region level.

Figure 5: SMEs in knowledge based services and in other services



Source: BERR, Work Foundation estimates

Note: Employees, excluding health care sector.

### Human capital development

The 2020 UK economy will have consolidated the UK's advantage in world class universities and driven the share of highly educated workers towards US levels. The higher education sector will be a magnet for the best and brightest students from overseas and a first choice provider of education services overseas to the rising middle classes across non-OECD countries.

The knowledge based economy will have narrowed the relevant qualification gaps against the G7 economies<sup>33</sup> and moved closer to a recast and more realistic 'Ambition 2020'. The education and training systems will through a demand-driven approach have brought skills, knowledge and qualifications into much closer alignment, improving confidence amongst both employers and individuals in the value of qualifications and therefore their willingness to invest in them.

By 2020 the UK will have created a skills framework that addresses the three key strategic weaknesses<sup>34</sup>:

- Mismatch between jobs and skills creating skill shortages and skills gaps, constraining output and reducing productivity;
- Employer ambition – the economy must drive a high demand for skills, as skills are a 'derived demand' from the shape and pattern of economic activity;

- Complexity of the skills system – the current system is unwieldy creating a ‘policy gap’; a ‘policy to practice gap’; and a ‘measurement gap’ according to UKCES.

These weaknesses run through the skills system from top to bottom. We identify three major high skill priorities for the knowledge economy over the next decade to help address some of them.

- STEM skills for growth – expand high quality supply with a bias towards the four productive growth sectors and areas of new technological and creative advance;
- Funding high level skills to increase further investment in the higher education sector and extend the global reach of the sector;
- Skills for innovation – aligning skills provision with the demand to drive up innovation across the private and public sectors.

Over half the workforce will by 2020 be in jobs associated with knowledge intensive work measured by existing job titles and if current trends continue 40 per cent will have higher education qualifications. In 2010 we face the prospect of rising demand for higher education places but no realistic means of fully meeting that demand through taxpayer funded expansion. We remain convinced that if the 2020 knowledge economy is to be realised we must continue to expand the higher education system.

This may be seen as a bold decision in the face of the temporary increases in graduate unemployment rates. But it would be a strategic error to cut back on future supply now. Knowledge economies absorb large numbers of well-educated people and will continue to do so. In every OECD economy the employment of graduates grew significantly faster than total employment between 1998 and 2007.<sup>35</sup> But equally any further expansion will have to mainly come from more private investment – through higher contributions from individuals, business, overseas students, and philanthropic sources.

This expansion must not be at the expense of excellence and quality. The UK must aim to move as many institutions and centres into the top 50 worldwide rather than the top 500. Scientific and technological excellence must also be matched by support for excellence in the institutions linked to the creative and cultural sectors in order to exploit new digital technologies for creative ends. In both cases greater engagement and funding from private sources and earnings from overseas will be required.

The biggest challenge over the next decade will be to reconcile the need for world class institutions and the reward of excellence in our universities, and sustaining the improvements in wider social access to the university system. This has been possible through generous public



funding over the past decade, but will be much harder to do so when public support in real terms will be falling.

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**Financial  
mobilisation –  
ending the  
doom loop**

By 2020 Britain's financial services industry should be a world leader in providing diverse, competitive and sophisticated services supporting socially useful production, innovation, and entrepreneurship at minimal risk to the rest of the economy. UK financial innovation and expertise in serving the productive economy and new areas of activity associated with the low carbon economy will have driven a revival of financial services exports and ensured the City remains a key international centre.

Competitive markets for both short and long term finance for industry and consumers would have been restored with the entry of new players with trusted brands from outside banking complemented by a revival of mutual organisations and new public based institutions providing vehicles for long term private investment in the physical and electronic infrastructure and an expansion of regional and local institutions backed by municipalities focusing on SMEs.

This vision can only be realised through a series of radical structural and institutional reforms. The ratio of bank assets to GDP should have been reduced significantly and the ability of the banks to protect those assets from risk should have significantly increased. The incentives for banks and other financial institutions to indulge in excessively risky investment on large scale would be removed. The 'casino' and 'utility' banking functions would be separated.<sup>36</sup> Mervyn King's objective of making sure that no one institution is too big to fail would have been achieved.

The 2009 Bischoff report argued the sector was not excessively large because it had fluctuated between 5 and 8 per cent of GDP over the past decade. A sector that was close to 5 per cent of GDP by 2020 would be within this band. But shares of GDP are also an irrelevant measure. The danger from the excessive size of financial services comes from the explosive growth of increasingly riskier bank assets to 500 per cent of GDP in 2007 coupled with a fall in the ability of banks to protect against risk without recourse to the State. It is this ratio and these exposures to risk that must be reduced.

We are in what the authors of a recent Bank of England paper<sup>37</sup> call a 'doom loop' where rather than the banks acting as lender of last resort to the State, the State has become lender of last resort to the banks, with the credibility of saying never again virtually eliminated. As the paper notes, past liquidity crises '*are foothills by comparison with recent Himalayan heights*'. States cannot afford to intervene again on such a scale. We must escape the doom loop over the next decade.

The financial services sector will decline as a share of GDP in the first half of the coming decade as demand from business and consumers weakens and financial institutions adopt more cautious lending policies.<sup>38 39</sup> It can expand again in the second half on the back of the structural innovations we have suggested above. Financial services employment grew in the 1980s recovery, but has added few jobs since and will not do so over the next decade. The sectors' contribution to job generation will come from the success with which it supports growth and innovation in other sectors of the economy.

### 3. New activities, new jobs – knowledge economy growth areas to 2020

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The innovation system described above operates across all sectors of the economy, public and private, big and small. It will drive forward high value activity in products, processes, and services. The impact will however be greatest in the four growth areas that we identified above. This section sets out what each growth group could contribute to the 2020 economy and what needs to be done to maximise their contribution.

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#### **Advanced manu-services**

At the heart of the 2020 knowledge economy will be an advanced high value activity 'manu-services' sector. Major companies will be supported by a strong network of technologically advanced and creative SMEs. Manu-services will be seen as a sector of choice for new graduates from both scientific and technological and creative backgrounds. After a decade of revival in output, exports, and investment, UK based manu-services will be seen as critically important to the UK's continued success and enjoy the same prestige as the City does today.

This requires a conscious government wide 'manu-services first' strategy. By this we mean looking at all aspects of policy and thinking through what this will do to support growth in the manu-services sector. This will include more conventional measures such as giving more weight to a competitive exchange rate, making sure R&D support packages are as flexible as possible and match those available elsewhere, and that skills of the right quality as well as quantity are available. But it also means thinking much more widely about enterprise policy, competition policy, the growth of the creative sector and the linkages to manufacturing, and above all how innovation policy can help make sure UK based manufacturing secures a leading role in new activities such as low carbon.

The critical importance of this sector has been reinforced by the danger of a much higher balance of payments deficit over the next decade as North Sea oil runs down and more energy is imported. Without action to boost manu-service exports and reduce dependence on energy imports, the imbalance could easily reach 5 per cent of GDP by 2020 compared with 2 to 3 per cent today.<sup>40</sup> Policy makers have up to now simply assumed that the UK's balance of payments deficit is sustainable, and given the issue little attention. It will be an increasingly untenable position for a medium sized economy like the UK if the deficit were allowed to double as a share of GDP over a decade.

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#### **The low carbon economy**

By 2020 the UK will have secured a world leading role in developing markets for low carbon goods and services, expertise in successfully implementing low carbon strategies, and using this to become a major exporter of goods, technologies, and knowledge services associated with the low carbon economy. The low carbon economy will develop along three inter-related scenarios:

- Implementation of existing technologies (eg switch to electric cars, energy efficiency through retro-fitting the building stock);
- Advanced manu-services, placing firms at the cutting edge of environmental technologies;
- New services –design, consultancy, brand equity, carbon trading.

The manu-services led carbon economy would include the rapid implementation of new nuclear and decommissioning programme; exploitation of Britain's offshore wind and tidal barrage and carbon capture technologies; the development of even more highly fuel efficient aero engines; new products to help retro-fit existing buildings. This would be complemented by developing services around regulatory expertise, financial services building on the UK's 60 per cent share of trading in carbon credits; and building on creative industry strengths such as design in low carbon products and architecture, software and computer services, advertising (encouraging and informing consumer acceptance and demand for low carbon products, services, and practices).

There is an impressive array of policy measures and thinking already underpinning the low carbon economy in the UK, among some of the most developed in the OECD. But it has still not overcome the major problem of uncertainty of future demand. Private industry will not invest on the scale required without further efforts to support the growth of the low carbon economy over the longer term. Support for low carbon activities across the public sector needs to be co-ordinated and focused on the areas most likely to develop and grow to make sure that limited funds have the greatest impact. We suggest the following measures:

- A cross-cutting audit of public support activities as part of the next Spending Review aimed at simplifying and rationalising the existing schemes and agencies;
- A single contact point for business advice and support funded out of the rationalisation suggested above;
- A single low carbon economy fund, linked to the long term ambitions of the Climate Change Act;
- A strong strategic commitment to creating a low carbon associated infrastructure – transport, telecommunications, housing, energy supply;
- Creation of regulatory and planning frameworks that give private investors confidence to invest long term.

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### The creative and cultural economy

By 2020 the UK's creative and cultural economy will have outgrown financial services as a share of GDP and consolidated the UK's role as a world leader. It will be a significant contributor to export growth and a major domestic generator of jobs and innovation – not just in its own right but through strong linkages with other key wealth producing sectors from advanced manufacturing to high tech services.

In 2008 the sector employed nearly two million people having grown by 26 per cent since 1997. It accounted for just over 6 per cent of GDP with (2007) and generated £17 billion in direct measured exports.<sup>41</sup>

The current demand for creativity is on an unprecedented and under-reported scale, often because it is not recognised as such. Yet as firms deploy new technologies and techniques, they are acting as creatively in producing knowledge as those engaged directly in creative services. The massive investment in knowledge based intangibles in areas as diverse as manufacturing, business and marketing services, and retailing shows how important creativity is to modern organisations in all parts of the economy.

Yet the underlying drivers of why we are an international success story are still unclear – on the face of it, other OECD economies are just as well educated (and some significantly better) and affluent, have access to the same technologies, and enjoy as rich a cultural and architectural heritage. Some is the accident of history, such as the English language; others such as cultural diversity are harder to pin down and are hardly unique to the UK. There is an historic public infrastructure that supports the creative sector – libraries, museums, art galleries, art and design schools and centres; and powerful public service based institutions such as the BBC and other media service providers.

Some will say that if the sector is doing well, then leave it alone – the current arrangements are delivering even if we are not sure why. But even before the current crisis, some sectors were showing signs of stress in response to the cyclical downturn. The sector is facing structural challenges in ways that will be strongly influenced by the public policy agenda – for example, the collapse of business models based on conventional advertising channels in electronic media, likely cuts in public support for the arts and related higher education institutions, the fall-out from the decline in financial services. And other OECD economies are recognising the value of expanding their cultural and creative sectors threatening the world leader position of the UK.

The Work Foundation's *Staying Ahead* report and the Department for Culture, Media and Sport (DCMS) strategic response were framed in very different circumstances. A strategic re-evaluation of the sectors future and the policy actions and frameworks is now required for the next ten years and it must be cross-departmental. The Work Foundation is currently planning to launch a new research programme – perhaps a *Staying Ahead 2* – to address these strategic questions around the place of the creative sector within the knowledge economy.

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### Making the most of the public sector

The state of the public finances means that the direct contribution of the public sector to job growth must be limited. But even within constrained spending totals, the public based knowledge industries will continue to make an immense contribution both in their own right and in partnership with private sector organisations and institutions. Public service innovation is not only a necessity, but can be a big driver of organisational and technological change to improve quality provided the right incentives and structures can be put in place. Too often the balance between reward and censure mitigates against risk and innovation.<sup>42</sup> A recent Kings Fund report sets out the role that technologies – which they define as any product, process, or service with an IT component – could transform the way NHS health services are delivered over the next decade.<sup>43</sup>

Some of the ways in which the public sector will help drive forward the knowledge based economy over the next decade include:

- Public procurement to encourage innovation and acceptance of the new;
- Development of the medical and health care science and technology base;
- The exploitation of the intangible asset base – such as design – to deliver better services at lower cost;
- The role of educational and creative and cultural institutions such as museums, art galleries, libraries, and design and art schools, and the BBC;
- The pioneering of low cost initiatives through users and communities aimed at changing public and private behaviours and outcomes – from making places safer to better health outcomes to supporting the development of the low carbon economy;
- Meeting the regeneration challenge through developing the knowledge based economy at city and city region level;
- Extending global reach of higher education as part of the drive to increase knowledge service exports and increase the UK's world standing and reputation as a leading knowledge economy.

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### **The challenge of widening social divides**

At the beginning of this statement we said the big challenge came in two parts. We have so far addressed the first part – we have identified the new activities and the new jobs that will lead the recovery. The second part is how this can be accomplished without widening significant gaps between the well educated and the less well educated and declining areas and growing areas of the national economy.

Some challenges were there before the recession hit. In the past, the growth of the knowledge economy was associated with growing polarisation with more jobs at the top, more jobs at the bottom and fewer jobs in the middle. Our work showed that in the decade before the recession, the gap between the well-educated and the less well educated in terms of employment and wage rates was stable, except at the very top.<sup>44</sup> So while the divides were not getting any worse, nor were they getting any better.

The recession has widened out some of those divides. So far over 80 per cent of the jobs lost have been for manual, administrative, and unskilled workers and these jobs do not come back in recoveries.<sup>45</sup> By 2009 over 80 per cent of the population with a degree was in work compared with less than 40 per cent of those with no qualification.<sup>46</sup>

The expansion of the knowledge based industries creates many more jobs than those we think of as 'knowledge workers'. Over the past decade, about two thirds of jobs created in these industries fell outside the conventional definition of knowledge workers.<sup>47</sup> But their skill sets – including soft skills – are different to those required for many of the jobs being lost. The knowledge based sectors offer few new jobs for those with more traditional manual skills or the unskilled and many routine administrative functions are being eliminated by technological advances. Opening up as many of the remaining jobs in the knowledge based economy in both the private and public sectors to those who might otherwise have been excluded will be a key priority over the next decade.<sup>48</sup>

The geographical impact of the recession has been to drive a further wedge between places that were struggling before and those who were doing well. The impending cuts in public spending will further widen those divides as the worst performing areas have often been dependent on expanding jobs in public based knowledge services. Building stronger private sectors in those areas will be a major challenge. People will move to places with more jobs as they always have done. But it is a selective movement that weakens the places they leave and strengthens the destination places. The most mobile are the young, the best educated and those with private resource.

Some of the work we are undertaking as part of the knowledge economy programme – especially on skills – will give us more insights into solutions. But The Work Foundation is also launching a new research programme *The Bottom 10 Million* to focus on this very problem and, with others, develop a set of recommendations. There are however some key benchmarks against which a successful and socially inclusive 2020 knowledge economy should be judged:

- A return to full employment with ILO unemployment rates at or below their 2007 levels;
- A significant improvement in the employment rate gap between the well-educated and the less well educated;
- A significant narrowing of the economic performance gap between the less well performing localities and the better performing;
- A more mobile society and economy – so people can move more easily from declining to expanding areas of activity.



## 4. Conclusions and recommendations

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In this statement we have set out our vision of what the UK's 2020 economy should look like. We think a future government should focus relentlessly on four major recovery groups of economic activity supported by a robust innovation system:

- Advanced manu-services;
- Low carbon economy;
- Creative and cultural activities;
- High tech and business services.

The 2020 knowledge economy will see productive high value sectors such as advanced manufacturing (manu-services) enjoy the same prestige and importance as the City did before the recession. It will have emerged as a world leader in the extent and sophistication of the low carbon economy. It will have paid equal attention to both the science and technology base and the arts, design and creative base and as a result the UK will have consolidated its role as a world leader in cultural and creative services. The high tech and business service sector will be a major job and export generator, supplying services and expertise across the world. There will be more higher education institutions in the world top 50, and the UK will be a world leader in advanced health care and the associated life-sciences. And the finance sector will be refocused on its key role of financial innovation in support of rather than the destruction of the productive sectors of the economy.

This vision is based on the possible – all the outcomes described above build on what we know the economy is good at and where we already have some advantage. Many of the underlying trends are already in play and will re-emerge once the recovery gathers strength. But without intelligent and focused intervention, we will at best see a pale shadow of what could have been and at worst an economy still racked with economic imbalances that condemn it to continued low growth and high unemployment.

A key objective must be on developing the right institutional, regulatory and legal frameworks to provide the right incentives for individuals, organisations and investors and reward innovation and entrepreneurship. The innovation system framework outlined here builds on solid foundations in many areas. But the challenges of the next decade require the next government to review and refocus and build a truly robust innovation system for 2020. As part of our continuing work on the knowledge economy we will be publishing a more developed set of proposals in time for the 2010 Spending Review.

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