

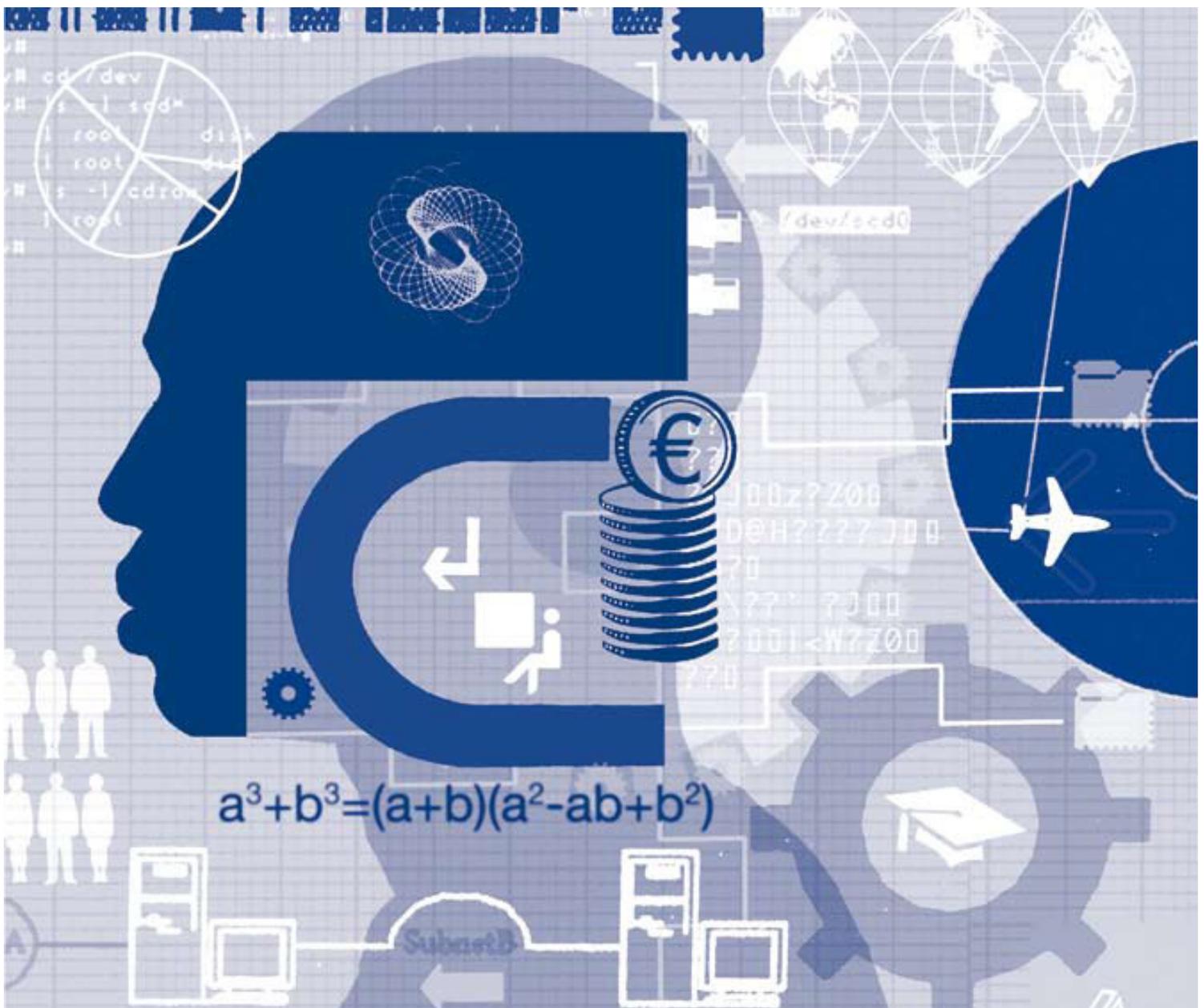
# Making the most of public services

## A systems approach to public innovation

A Knowledge Economy programme report

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## Executive Summary

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While our economy is showing tentative signs of recovery, the public sector is facing almost unprecedented challenges. An innovation miracle is being demanded from the centre – services are facing a triple lock of shrinking public spending, expanding service demands and a broad reform agenda. Looking at two case studies – international higher education and the NHS – this paper highlights that the government is struggling to understand how to support innovation within public services, and that this will impact on the future performance of both public and private sectors.

The 2010 Spending Review has confirmed public spending cuts of £81bn by 2014/15. Public sector employment is now predicted to fall by 310,000 over this period.<sup>1</sup> Pressures from an ageing population and other broad social characteristics of change, such as shifting identities and rising citizen expectations, are placing greater needs on public services just as resources to meet these are being withdrawn. Complicating the picture further still, the government is planning broad changes in the ways in which the public sector relates to the private.

The government is committed to better leverage its credit rating and scale to pool large contracts in order to drive down prices. It is however, also keen to award more contracts to small and medium sized enterprises. Perhaps of greatest significance however is the ambition to open all public services (save the judiciary and security services) to private competition – with a view to drive innovation through increased marketisation. Changes on this scale will demand careful management, and more often than not, additional resources to aid transitions. Unfortunately these changes will be implemented at a time of massive upheaval in the public sector.

### **The public innovation challenge**

Over the coming decade, despite this upheaval, three key asks will remain for the public sector; it will still need to deliver world class public goods and services, pressure will remain to do this in a way which places the minimum cost burden on private enterprise, and the public sector will continue to play a major role in the wider UK economy – particularly in the knowledge economy through the position of the public sector within the wider innovation system. This last role is often undervalued, yet public activities connect directly to the wider economy in much more than financial terms.

Success in this challenging environment will depend on the public sector rapidly finding ways to better deliver public services, and to better leverage its support for the wider economy. Unfortunately the public sector has a poor recent productivity record – in the past decade, dramatic expansions in public investments have failed to boost productivity in the public sector. Our best measurements suggest that public sector productivity actually fell between 1998 and 2008<sup>2</sup>.

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<sup>1</sup> OBR (2011) Economic and Fiscal Outlook, March 2011

<sup>2</sup> ONS UK Centre for the Measurement of Government Activity (2010) Total Public Service Output, Inputs and Productivity

It is in this context that this paper looks to consider how public sector organisations invest in innovation and support wider public-private innovation networks. Despite often looking to the private sector to understand innovation, two important areas of thought on innovation are conspicuously absent from the study of the public sector. The first is the understanding of innovation as driven by investments in intangible assets – the knowledge based assets that which are understood to be central to performance in the knowledge economy (R&D, software, design, brand equity and human or organisational capital). The second is the notion of an innovation system – the set of institutions, relationships and interactions through which innovations emerge and develop.

As we identified in The Work Foundation’s previous research on the topic, *Accounting for Intangibles*, private sector understanding of intangible assets has been poorly translated into the public sector. This is an issue since the evidence confirms that the activities of the public sector are highly knowledge intensive and therefore depend particularly on these intangible assets – compared to private industry, public sector employment is characterised by a greater share of employment in knowledge intensive services, a larger share of the workforce qualified to degree level, employment is more concentrated in the three most knowledge intensive occupations (managers and senior officials, professionals and associate professional and technical occupations), and a higher percentage of workers describe their work as including at least some knowledge tasks.<sup>3</sup> Our initial assessment suggests that public investment in these intangible assets is in excess of £50bn each year, yet we poorly understand how this supports the operation of public services, or supports public-private innovation networks.

This research paper looks to address this gap through two case studies. The first focuses on the public sector intangible assets bound up within the UK’s higher education sector – exploring how these are managed and exploited through international education exports. The second looks at how the NHS connects to the private sector and how well it supports public-private innovation ecosystems within its supply chains.

### **Case One – The UK’s international education market, managing public sector intangible assets**

In recent years the UK has been exceptionally successful in creating value from international education. Direct international revenues are close to £3bn, and off campus expenditure totalled £2.2bn in 2007/08,<sup>4</sup> though some have valued the broader contribution of these activities much more strongly. Together, this trade should be viewed as a highly knowledge intensive export activity. Its performance depends on the management and exploitation of the public intangible assets bound up within our higher education institutions.

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<sup>3</sup> See figure 3 for further details

<sup>4</sup> Universities UK (2009) ‘The impact of universities on the UK economy’ accessible at: <http://www.universitiesuk.ac.uk/Publications/Documents/EconomicImpact4Full.pdf>

Prospects for growth in the coming decade are mixed. The UK performs strongly in a number of growing markets, but is also facing increasingly stiff international competition for students and transnational education arrangements. In such a context strong management and effective activity to exploit these public intangible assets will be essential. Question marks over the future funding of our higher education institutions (especially when compared to other international responses to the economic climate) represent a significant risk here.

While the UK has invested strongly in marketing our higher education sector abroad, and individual institutions appear to pursue strong international strategies, recent government action on visa arrangements threatens to undermine this work. The tightening of arrangements risks impacting on pathways into higher education and negatively impacts on the overall attractiveness of the UK as a destination. Overall therefore, in the case of international education, there are significant limitations in terms of how well we are exploiting our existing strong public sector intangible asset base.

### **Case Two – The NHS and the healthcare sector, managing a broad innovation ecosystem**

The NHS is already facing many of the challenges that the wider public sector will soon be forced to confront. It represents a highly knowledge intensive area of activity where productivity growth has been poor in recent years. Significant financial constraints are being imposed on its activity at a time when demands for its services are increasing and it is facing significant reform in terms of how it connects to the private sector. The NHS therefore represents an opportunity to study how our public sector connects to private industry to drive innovation at a time of particular stress.

The NHS has a poor record on innovative procurement. It is patricianly damning that the dramatic increase in spending here has not translated into any productivity improvements. The NHS appears to be poor at presenting demands for and purchasing innovative products and services. This acts as a barrier to innovation across the UK's public and private healthcare sectors.

Our research identified that a number of highly positive initiatives were introduced in recent years specifically targeting this issue. Unfortunately, current spending constraints and the reform agenda appear to have stifled progress, just when it is most needed. The analysis paints a picture of a system at risk of stasis – funding for many of the building blocks of the public-private healthcare innovation system appear to be being transformed or cut, and reforms appears to be blocking central activity here. There is an urgent need for clarity and certainty about who will have the responsibility for building this public-private innovation system in the future.

Overall, within the NHS it appears that reform programmes are distracting attention from, and even retarding progress on how the NHS drives and supports innovation within its supply chain. The case illustrates the need to create or refocus bodies to build intermediary institutions capable of supporting a broad innovation ecosystem.

### Reflections and policy messages

In the cases studied here it is clear that an innovation miracle is being demanded of the public sector, but it appears that innovation is not being adequately supported. There appears to be a weak understanding of how the public sector invests in and exploits its intangible assets. Equally worryingly there appears to be a limited awareness of how public spending supports innovation – either directly, or through broad innovation systems. There is a significant risk that without this knowledge, innovation will be cut along with spending.

The current reform agenda appears to focus on driving innovation in the public sector through market mechanisms alone. Public services could benefit from taking a broader view of how to build external networks that are capable of supporting innovation. Building intermediary institutions capable of supporting relationships which can nurture innovations and strengthen public-private innovation ecosystems would drive performance (and efficiency savings) across the public sector, and could boost the growth of our private economy.

Making the most of our public services will demand a fuller understanding of how public resources can build supportive innovation ecosystems, and a broad change in how innovation is considered and invested in within the public sector:

- **Public services need to develop a better understanding of how they invest in innovation** – central guidance on valuing and managing investments in intangible assets would aid this;
- **Public services must learn from private sector best practice** of how to support the development of ecosystems capable of driving innovation across many organisations. Central to this will be continued efforts to support the development of intermediary institutions with the capacity to nurture broad innovation systems;
- **Public services should focus on fostering new types of relationships** with private sector partners – a shift from adversarial engagements towards more collaborative arrangements would better support the co-development of innovative new products and services as well as the easier transfer of best practice.

Our public services must be viewed as part of the knowledge economy. Only with this understanding can the government ensure public funds are being invested in a way that drives innovation and boosts performance across the public and private economy. In the face of mounting challenges for public services, it is critical that we continue to priorities support for the public-private innovation ecosystems that lie at the heart of our knowledge economy.

## Introduction

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The public sector is facing almost unprecedented challenges. It is under pressure to dramatically curtail spending while also meeting increased demands for services, all in the context of a broad public reform agenda. Together these three asks imply a need for a productivity miracle. Unfortunately, our analysis suggests that, while dramatic increases in productivity are being demanded of the sector, not enough is being done to support processes of innovation, particularly in terms of how public and private sector organisations connect.

The current public reform agenda appears to focus on driving innovation in the public sector through market mechanisms alone. This analysis suggests that public services could learn from successful private sector experience of how to invest in innovation and how to support the development of ecosystems capable of driving innovation across many organisations.

The term knowledge economy is rarely associated with the public sector, and yet the knowledge economy is hard wired into its operation. Public sector employment is dominated by knowledge work<sup>5</sup> and the sector connects directly to the private knowledge economy through its £243bn annual procurement budget<sup>6</sup>. If the public sector is to successfully respond to the exceptional pressures of fiscal reduction in the context of new demands on its services, then it must be correctly thought of and supported as a knowledge economy sector.

The broad size, scale and reach of the public sector will be determined by various government and democratic decisions. However, common to the rest of the knowledge economy, its future performance will depend on conditions such as the availability of skills, investment decisions, the ability of managers to motivate their workers and the successful development of ecosystems which can support innovation. These are equally relevant considerations across the knowledge economy.

The importance of getting this context right goes far beyond the confines of the public sector. Public activities connect directly to the wider economy in much more than financial terms. In the past, The Work Foundation have illustrated the breadth of ways in which the public sector can help to drive forward the knowledge based economy. Public procurement can encourage innovation and acceptance of the new as well as the development of innovative new technologies and products. Publicly supported educational and creative and cultural institutions such as museums, art galleries, libraries, design and art schools and the BBC play a major role in the knowledge economy through the creation of expressive value and their position as knowledge hubs. Public institutions play an important role in meeting the regeneration challenge through developing the knowledge based economy at city and city-region level. Also, higher education institutions can directly

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<sup>5</sup> Compared to private industry public sector employment is characterised by a greater share of employment in knowledge intensive services, a larger share of the workforce qualified to degree level, employment is more concentrated in the three most knowledge intensive occupations and a higher proportion of workers describe their work as including at least some knowledge tasks. See figure 3 for further details.

<sup>6</sup> HM Treasury (2010) Public Expenditure Statistical Analysis – Total gross current and gross capital procurement, 2009/10 estimated outturn.

drive the export of knowledge service exports and increase the UK's world standing and reputation as a leading knowledge economy.

It is clear therefore that making the most of our public services demands a broad appreciation of how they drive innovation across the economy.

### **The 2010s – a decade of disruptive change for public services**

In 2010/11 public spending totalled £696.8bn<sup>7</sup>. The 2010 Spending Review has confirmed public spending cuts of £81bn by 2014/15. Over this period the Office for Budgetary Responsibility forecasts predict public sector employment will fall by 310,000.<sup>8</sup> If the public procurement budget is cut by the same proportion as total spending noted above, then this would imply a withdrawal of approximately £30bn to the private sector.

This reduction in resources is occurring at a time when the demands placed on public services are increasing. Set out in the box below, the 2020 Public Services Trust have identified five major challenges facing public services in the future. Taken together, our ageing population and other broader social characteristics of change will place significant pressures on public service delivery.

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<sup>7</sup> HM Treasury (2010) Spending Review 2010 –Total Managed Expenditure measure. Accessible at [http://cdn.hm-treasury.gov.uk/sr2010\\_completereport.pdf](http://cdn.hm-treasury.gov.uk/sr2010_completereport.pdf)

<sup>8</sup> OBR (2011) Economic and Fiscal Outlook, March 2011

### Key challenges facing public services in the 2010s

- **Demographic driven demand:** increased demand for public service because of ageing and, potentially, a larger than expected number of young families in the population.
- **Shifting identities:** individuals have more complex identities and affiliations at the family, community, local and national levels, presenting challenges to identify the mix of services required, and how they should be organised.
- **Meeting diverse demands:** the problem of reconciling individualism and public good in policy areas where there is no consensus and where fundamental differences in values and priorities remain between sections of society.
- **Rising citizen expectations:** we will expect more from public services, particularly service standards that meet the best that the private sector can offer.
- **Technology:** is changing the way we live, work, and interact with each other in fundamental ways. This has implications both for the types of public services that will be needed and the ways that they are delivered. Technology presents clear opportunities to deliver services more efficiently and in ways that better meet the needs of service users, but at the same time, problems of access to technology can exacerbate inequalities.

Taken from 2020 Public Services Trust (2009) Drivers for Change Citizen Demand in 2020

Complicating the picture further still, the government is also planning broad changes in the ways in which the public sector relates to the private. They have committed to implement the recommendations of the Efficiency Review conducted by Sir Philip Green<sup>9</sup>. This will result in a tightening of procurement procedures across government. Central to Sir Philip's review was the criticism that "The Government is failing to leverage both its credit rating and its scale". It identified shortcomings in procurement data, and significant variations in the prices paid for common items across government. He concluded that this was a result of the government not sufficiently pooling contracts across public sector organisations, and instead letting too many small contracts.

In many instances this approach may promote greater efficiency. The tightening of procedures will be unwelcome however, if it reduces flexibility and curtails the ability of public sector organisations to pursue innovative (and perhaps by definition individual) procurement strategies. Equally, if such a policy cut the numbers of suppliers which rely on public sector contracts, this change could inadvertently impact negatively on competition in the long run. The approach is also potentially at odds with the coalition's

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<sup>9</sup> Green (2010) Efficiency Review by Sir Philip Green. Accessible at: <http://download.cabinetoffice.gov.uk/efficiency/sirphilipgreenreview.pdf>

commitment to drive innovative delivery in public services by increasing the proportion of public procurement which is accessible to small and medium sized businesses – the Coalition Agreement contained an aspiration to award 25 per cent of government contracts to SMEs, an aspiration repeated in the 2010 White Paper ‘Modernising Commissioning’<sup>10</sup>.

However, more significant than changes in the nature of procurement practices is the commitment from the coalition to open up more public services to private competition. David Cameron outlined in February this year a vision for public services within which there is a presumption “that public services should be open to a range of providers competing to offer a better service.”<sup>11</sup> This could potentially represent the opening up of all public services (save the judiciary and security services) to competition from private companies, voluntary groups and charities. Change on this scale will demand careful management, and more often than not, additional resources to aid transition. Unfortunately these changes may be being implemented at a time of considerable public sector upheaval.

Finally, changing government structures will have significant implications for how public and private institutions connect. In particular, the Coalition Government have committed to broad changes in how central and local institutions relate to one another. As set out with the Localism Bill there is a general commitment to devolve responsibility down to lower levels of governance. These changes will have far reaching implications for how such public institutions engage with the private sector. Greater freedoms may allow local institutions the opportunities to tailor how they engage with the private sector to meet local needs. However, the fragmentation of national systems and commissioning arrangements may complicate how public and private organisations interact.

### **The public innovation challenge**

The fundamental challenge for the new government will be to develop the capacity of public services to respond positively to these challenges. Over the coming decade three key asks will remain for the public sector:

- To deliver world class public goods and services;
- To do this in a way which places the minimum cost burden on private enterprise; and
- To support the wider UK economy – particularly the knowledge economy through the position of the public sector within the wider innovation system.

Achieving these goals in the context of tight public spending will certainly represent a major challenge. In effect, spending increases are hard-wired into the operation of the

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<sup>10</sup> Cabinet Office (2010) Modernising Commissioning: Increasing the role of charities, social enterprises, mutuals and cooperatives in public service delivery. Accessible at: <http://download.cabinetoffice.gov.uk/green-paper/commissioning-green-paper.pdf>

<sup>11</sup> Daily Telegraph (2011) Releasing the grip of state control. Accessible at: <http://www.telegraph.co.uk/comment/8337239/How-we-will-release-the-grip-of-state-control.html>

public sector – there has not been a year-on-year fall in spending since 1947<sup>12</sup>. Governments have historically found it very difficult to cut current public spending as a proportion of GDP.<sup>13</sup> Instead, capital and other forms of long term investment have tended to be cut disproportionately.

But success will depend not on cutting spending where it is easiest or where spending is least popular with the public, but on supporting innovation to better achieve these three goals with fewer public resources. Success will depend on supporting a mix of incremental improvement innovations as well as many far more disruptive and transformative changes. Indeed, viewed from this perspective cuts represent a driver of change which could create an important opportunity to reconsider the operation of much of the public sector.

In recent times the public sector has looked to private enterprise to understand innovation.

For example this was the rationale which drove the far reaching changes in the structure of the civil service in the 1980s and 1990s. However, two important areas of thought on innovation are conspicuously absent from the study of the public sector. The first is the understanding of innovation as driven by investment in intangible assets – the knowledge based assets which are understood to be central to performance in the knowledge economy. The second is the notion of an innovation system – the set of institutions, relationships and interactions through which innovations emerge and develop.

This research looks to consider the application of these concepts in the context of public services. To explore both of these further it focuses on two areas of highly knowledge intensive public sector activity – areas where intangible assets and the innovation system are of particular relevance:

- The UK's strong international education sector can be best understood as a highly knowledge intensive, public sector dominated<sup>14</sup> area of export activity. Study here allows for consideration of how well the UK manages and exploits the public intangible assets of the Higher Education sector – the analysis suggests that there are significant limitations to how well these assets are exploited; and
- The healthcare sector is dominated by the public sector. Study here allows for an understanding of how the public sector connects to private industries. In particular, the ways in which it can build a robust and effective ecosystems for innovation which succeeds in connecting the full range of healthcare consumers, providers and commissioners – the case study highlights that the current political agenda is poorly supporting innovation here.

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<sup>12</sup> Consolidated historical public sector spending data is available from <http://www.ukpublicspending.co.uk/>

<sup>13</sup> Public current spending was 38.2% of GDP in 1978/79 and 37.6% in 1996/97 according to the Treasury (table 4.1 PESA (2009)) – a very small contraction for a government renown for 'rolling back the state'.

<sup>14</sup> While higher education institutions are not classified as part of the public sector in national accounts this research treats them as public sector organisations, reflecting general perception and the fact that their activities are dominated by public funding and are heavily reliant on government decisions. The research is not however intended as a comment on the autonomy or role of UK higher education institutions.

### Understanding Innovation in the Private Sector

#### Defining Innovation

Innovation represents the creation and application of new knowledge. In the private sector this can be easily understood as the commercialisation of a new product or services to meet a market demand, or the creation and implementation of processes which improve the productivity of existing activities.

In this way innovation represents more than invention or discovery. It is a much broader concept which depends on the ability to derive value from an invention. As Corrado notes, “innovation goes beyond the upstream discovery of new inventions and technologies by scientists and engineers, beyond the creation of new ideas and designs by other workers, and beyond the turning of those inventions and ideas into new products and services. Inventions, ideas, new products, and new services are worthless without a downstream process that turns them into something that convinces people and firms to become customers.”<sup>15</sup>

#### Innovation as the Product of Investment in Intangible Assets

At its core, the knowledge economy story is a description of the transition from a reliance on physical capital and low cost labour for competitive advantage and organisational performance to an economy where advantage increasingly comes from investment in knowledge based intangibles – R&D, software, design, brand equity, and human and organisational capital.

Changing consumer demand, new “general purpose” technologies and globalisation, have together facilitated profound economic changes across all of the economies for which comparable statistical information exists. These are affecting all sectors, all sizes of firms, and both the public and private sectors:

- A shift in business investment priorities from investment in physical assets to knowledge based intangible assets;
- The rise of knowledge based services<sup>16</sup> as major generators of value added, exports, and new jobs; and
- The growth of an increasingly well-educated and qualified workforce.

The first of these phenomena has been of particular relevance for understanding innovation. The importance of investment in intangible assets builds on the idea at the

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<sup>15</sup> Federal Reserve Board (2007) Comment Submitted to the Advisory Committee on Measuring Innovation in the 21<sup>st</sup> Century Economy.

<sup>16</sup> As defined by the OECD. KE services include business, financial, communication and high tech services and education and health services. KE industries also include high to medium high tech manufacturing.

heart of endogenous growth theories, that innovation is the product of investments in innovation. Understanding innovation therefore demands an appreciation of investment in new knowledge, intellectual assets, intellectual capital, knowledge capital, or as the concept is now commonly termed, intangible assets.

Understanding investment in these intangible assets is increasingly appreciated as key to understanding the development of the knowledge economy. By the mid 1990s, policy makers realised it was increasingly hard to describe how modern economies worked without also taking account of investment in intangible assets. Since then, many researchers across the OECD have adopted the same methodology to produce estimates of intangible investment. Although there is no official definition of intangibles, the way intangibles are defined in these studies is emerging as the “de facto” international economic measure of intangible assets. Intangibles are typically grouped by economists into three broad areas – computerised databases (software and databases); innovative property (copyright, R&D, design); and economic competencies (firm specific training, brand equity, organisational capital). A comparison of tangible and intangible assets is set out below (Table 1).

**Table 1: Intangibles and tangible forms of investment**

Tangibles	Intangibles	
Buildings	Computerised information	Software and databases*
Plant and machinery	Innovative property	Scientific and non-scientific R&D Mineral exploration, copyright, licence costs* New products from the finance industry New architectural and engineering designs
Vehicles	Economic competencies	Brand equity (strategic advertising plus market research) Firm specific human capital (employer provided training) Organisational structure (share of management time spent on strategy plus cost of external consultants)

As summarised within our recent report *Accounting for Intangibles*<sup>17</sup>, this understanding of intangible assets has supported much research on intangible assets within the private sector. This has focused on:

- **Accounting for investment in intangible assets within reporting practices** – Investment of this nature can not be readily handled within standard accounting practices. These allow only for the inclusion of intangible assets where they are identifiable, separable and reasonably expected to generate future economic

<sup>17</sup> Lekhi, R. (2010) *Accounting for Intangibles*, The Work Foundation

benefit. However significant progress has been made on how to develop consistent complementary information describing corporate intangible assets;

- **Identifying the scale of investments in intangible assets across the private sector** – Initiatives such as the NESTA Innovation Index aim to aggregate all business investment in intangible assets. They calculate that this investment totalled £141bn in 2008 (NESTA 2011);
- **Intangible asset growth accounting** – A number of authors have gone beyond the identification of assets and investment to identify what proportion of economic growth can be attributed to investments in intangible assets and innovation – Barnes and McClure (2009) offer an international review of this work. Recent NESTA estimates suggest that between 2000 and 2008 intangible capital deepening accounted for 23 per cent of labour productivity growth (NESTA 2011).

### **Innovation as the Product of a System**

Innovation outcomes can not be fully understood from the perspective of investment in intangible assets alone. In the case of investments in tangible assets (such as new machines in a factory) it is possible for the entrepreneur to make a reasonably well judged estimate of the likely impact of investment in the tangible assets on output. This is rarely the case with intangible assets. High levels of uncertainty surround investment in groundbreaking R&D, spending on branding or corporate images, or novel training to improve the innovative capacity of the workforce.

Innovation depends on a wide range of external conditions and relationships which shape the outcomes from investments in intangible assets. In the private sector, the innovation process is increasingly understood from a systems perspective. Lundvall (1992), Nelson *et al.* (1993) and Braczyk *et al.* (1997) describe national and regional systems of innovation based on interactions and relationships in the production, diffusions and use of new and economically useful knowledge. This networks approach offers a particular focus on the linkages, interactions and complementarities between individuals, firms and institutions which support and condition the innovation process.

The system can perhaps most readily be understood based on the notion of the building blocks of knowledge creation, entrepreneurship, the selection of potential innovations and the mobilisation of resources to support the process. Investments in intangible assets represent inputs into this system, and innovation its self is the output. The efficiency of the system (its ability to generate innovations from investment) is determined by the condition of the system – how the building blocks operate, and how they link and interact with each other.

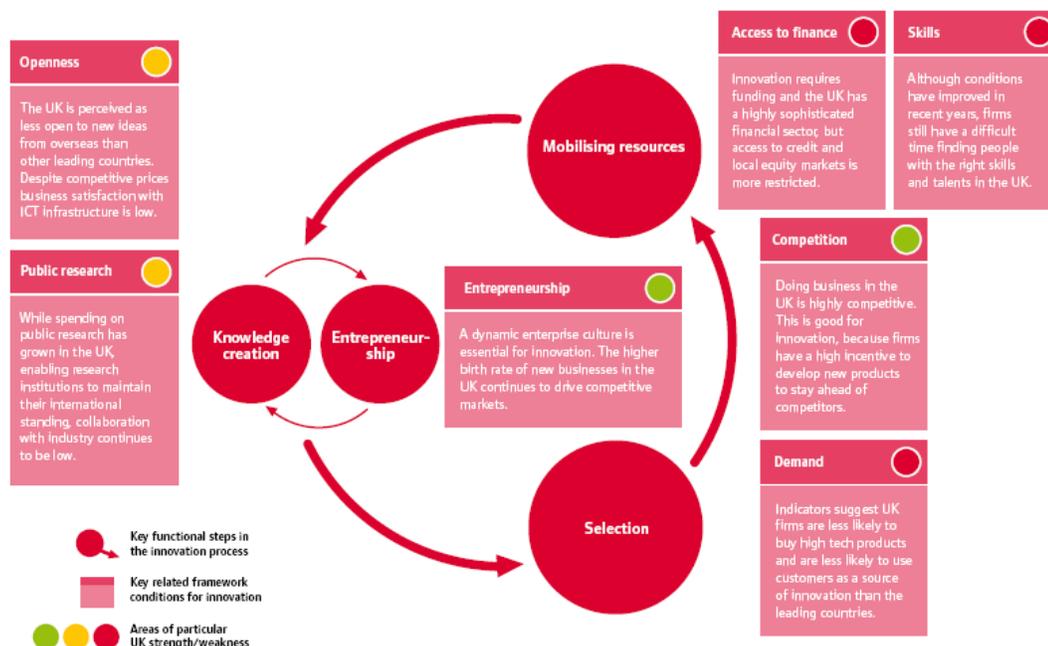
Work by NESTA (2009) identifies a number of these conditions (summarised in Table 2: Enabling Conditions of the Innovation System) and illustrates the circular nature of this process (Figure 1: The Innovation System).

**Table 2: Enabling Conditions of the Innovation System**

	Description	Enabling Conditions
Knowledge Creation	Firms innovate by creating and adopting new knowledge	<p><b>Public Research.</b> Both the amount spent on public research, and the strengths of business-industry links.</p> <p><b>Openness.</b> How quickly and effectively good ideas can diffuse and be absorbed. This includes both the physical infrastructure for openness (such as broadband infrastructure) and its social underpinnings (such as how hierarchical workplaces are).</p>
Entrepreneurship	The commercial exploitation of this new knowledge	<p><b>Entrepreneurship.</b> How effectively new businesses spring up to take advantage of innovative opportunities, and how willing people are to take the risks necessary to innovate.</p>
Selection	The refining of applied new knowledge to the most effective and efficient projects	<p><b>Demand.</b> Whether customers are willing to buy innovative products. An important part of this is government's willingness to produce innovative products.</p> <p><b>Competition.</b> The overall level of competition in the economy.</p>
Mobilising resources	It takes resources to generate ideas and to take existing ideas forward	<p><b>Access to Finance.</b> Whether risky, innovative businesses can attract funding, in particular venture capital, but also other forms of finance such as business credit.</p> <p><b>Skills.</b> Whether skilled workers are available to work in an innovative venture, and whether workforces have the necessary skills to innovate themselves.</p>

Source: Drawn from NESTA (2009) The wider conditions for innovation in the UK: How the UK compares to leading innovation nations

Figure 1: The Innovation System



Source: Adapted from NESTA (2009)

The key strength of the systems approach is that it allows for the consideration of questions about individual blocks, links or institutions within the context of the wider system of support for innovation. For example, with a systems approach it is possible to consider how financial institutions support the mobilisation of resources for innovation within the context of how such institutions interact with other components of the system – such as product markets and research boards (the key constituents of the selection component of the system).

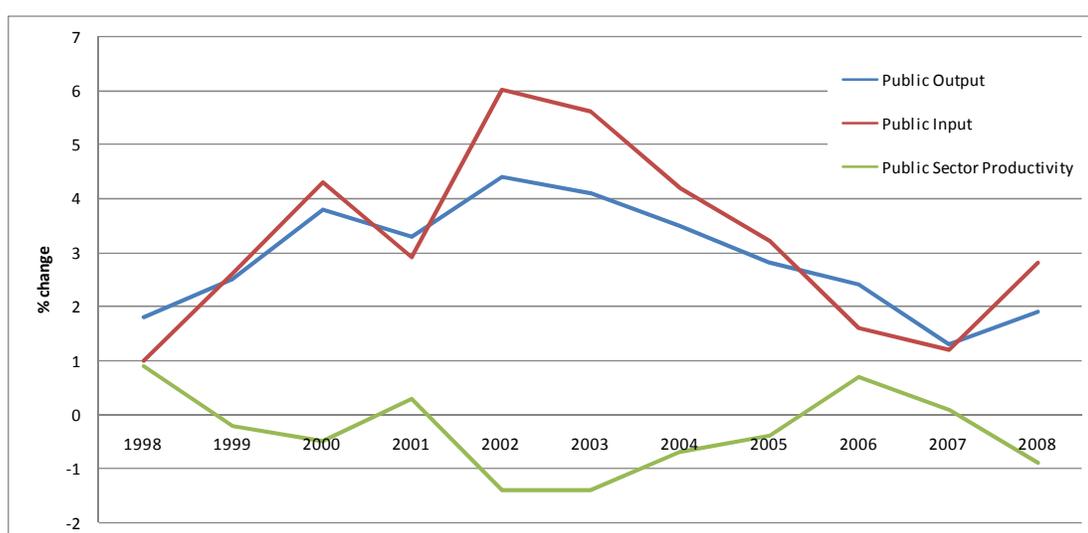
The traffic lights and descriptions included in Figure 1 above reflect the application of the innovation systems approach to national level analysis. An additional strength of this system’s approach however, is that it can be considered at any economic level (a whole economy, an individual sector, a single firm, a single team or even an individual worker) as well as at any geographic level (global, national or within a local labour market).

### Understanding Innovation in the Public Sector

The study of innovation in the public sector is complicated by the fact that the outputs are typically not sold through market mechanisms. This makes the task of valuation a challenge. Historically Gross Value Added (GVA) and productivity in the public sector has been calculated based on spending. This input measure however is unable to capture any increases in the benefits arising from any innovation.

However, in considering the public sector Mulgan and Albury (2003) note, “innovation is the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in outcomes efficiency, effectiveness or quality”. In recent years there has been an attempt to apply this outcomes approach to measure the activities of the public services. Work by the UK Centre for the Measurement of Government Action has looked to calculate changes in public sector productivity based on quality and quantity factors such as pupil attendance and the number of healthcare procedures performed – see Figure 2.

**Figure 2: Growth in total public service output, inputs and productivity, 1998-2008**



Source: ONS UK Centre for the Measurement of Government Activity (2010) Total Public Service Output, Inputs and Productivity (<http://www.statistics.gov.uk/articles/nojournal/tpsopjuly2010.pdf>) and EUKLEMS

It is a concern that this sophisticated approach shows that productivity has not increased with the expansion in public spending over the past decade. We might have hoped that increased investment in public services could have supported innovation and productivity growth within these services. It is in this context of low productivity growth that we will be asking our public services to innovate to dramatically improve their economic performance.

Given that an understanding of investments in intangible assets and a systems approach to innovation appear to be powerful in understanding and helping to explain differences in innovation in the private sector, their relative absence from the study of the public sector is conspicuous.

### **Intangible assets within the public sector**

Although we know an increasing amount about the scale, composition and economic impacts of intangibles in the private sector, we know relatively little about intangibles in the public sector. In particular, as we identified within *Accounting for Intangibles*:

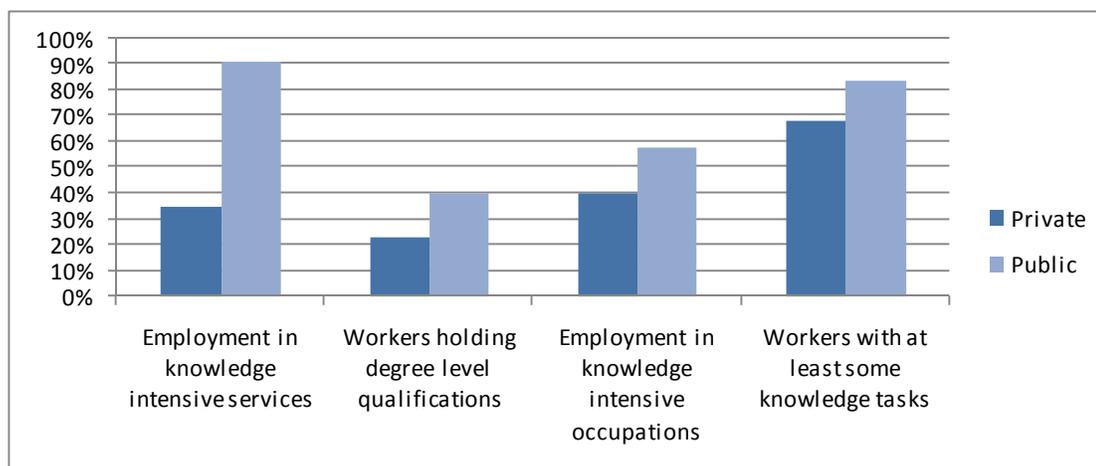
- Advances in accounting practices have been poorly translated into the public sector – the state of the debate around models of intangible asset exploitation in the public sector is beset by recurrent conceptual and definitional problems and a marked lack of coherent research;
- Growth accounting has not been possible – the lack of clarity and available data has complicated the analysis of the implications of investments in intangible assets;
- The management of intangible assets within the public sector has been poorly researched; and
- Current debates about the use and exploitation of public sector intangible assets are often characterised by a worrying lack of clarity about what public organisations should actually be trying to do.

### **Understanding the scale of intangible assets within the public sector**

Measured by employment and value added, the public based knowledge services of education and healthcare account for about 40 per cent of the UK's knowledge economy and have historically been large providers of jobs. Analysis of data from the Labour Force Survey and The Work Foundation's 2007 Knowledge Worker Survey confirms that public sector activities are highly knowledge intensive. Compared to private industry, public sector employment is characterised by a greater share of employment in knowledge intensive services, a larger share of the workforce qualified to degree level, employment is more concentrated in the three most knowledge intensive occupations (managers and senior officials, professionals and associate professional and technical occupations), and a higher percentage of workers describe their work as including at least some knowledge tasks.<sup>18</sup>

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<sup>18</sup> It is worth noting that the high knowledge intensity of public sector work identified does not appear to be a simple result of the fact that public sector employment is concentrated in sectors which are thought to be particularly knowledge intensive – healthcare and education. Public sector activities were identified as particularly knowledge intensive across a broad range of industrial areas.

**Figure 3: Knowledge Intensive Activity in the Public and Private Sector**

Source: LFS Q4:2010 and The Knowledge Worker Survey (2007)

Given this knowledge intensity, we can expect intangible assets to play a major role in the operation of the public sector. While no data exists on the scale of investment in intangible assets, it is possible to identify categories of public spending which match closely to investments in various intangible asset classes<sup>19</sup>. Examples of such spends include government information creation, tertiary education and public spending on research and development. Together our analysis indicates that the annual public sector investment in intangible assets is in excess of £50bn<sup>20</sup>.

While this figure is considerably greater than the £45bn invested by the public sector in Gross Fixed Capital Formation in 2009<sup>21</sup> (broadly equivalent to tangible assets), as noted above, we know relatively little about how this spending supports innovation. Filling this gap is important. Given the scale of knowledge intensive activities in the public sector, intangible assets are certainly central to much of its operation. Better understanding this spend will be central to a stronger understanding of public sector innovation. In the current climate it is particularly important to understand what this spend is supporting so that the implications of any cuts can be anticipated and managed to protect the investments that will support innovation.

In addition, as in the private sector, public intangible assets are often sources of additional revenue – for example some information assets (such as the electoral roll) are sold directly, and there are a growing number of examples of public sector brands being

<sup>19</sup> We have conducted this analysis following the methodology developed by Jarboe (2009) in his analysis of US Federal spending.

<sup>20</sup> Note that this analysis draws on an extensive list of public data sources including time series public datasets, departmental annual reports as well as the results of one-off pieces of analysis. We have presented the most recent data available from each source. This does mean however, that some data items are aggregated across different years. For example departmental spending on research and development is available from 1981 to 2007. In contrast, data on public sector spending with consultants is only available for 2005, via a one-off National Audit Office report the following year.

<sup>21</sup> ONS (2010) Blue Book

exploited commercially. This is an area of increasing interest, but very little is known about how the value of these public sector intangible assets can be maximised. A stronger understanding of how intangible assets are supported may have important implications for how such assets are viewed.

### **The absence of a systems approach to innovation**

Understanding public sector innovation has been an important area of research. The text box below summarises some of the core themes within this work:

#### **Trends of public sector innovation:**

- Organisational structure – a focus on the organisation structures which promote innovation;
- Partnerships – the advantages of arrangements such as Public Private Partnerships;
- Horizontal integration – cutting across departmental silos to foster co-operation;
- Good fiscal management – budget reform and fiscal management;
- Performance-based management and budgeting;
- Public service revitalisation – a focus on organisational capacity building;
- Devolution and decentralization – advantages of devolving powers to local/ regional organisations;
- Service improvement – a focus on the benefits of client-centred services;
- Systems and process improvement – the streamlining of business processes;
- Regulatory change – such as deregulation, simplification, and voluntary compliance; and
- Use of IT for both front and back office operations – such as providing on-line “e-enabled” services, investing in customer relationship management and service-orientated architecture technology.

Drawn from IDeA (2005) Innovation in Public Services Literature Review

However, compared to the innovation systems approach these all focus on individual components of what is understood to be the innovation system in the public sector. While detailed analysis of each component of the system is absolutely vital, there is also a need to seat it within a wider framework of understanding.

Recent research published by NESTA<sup>22</sup> looks to respond to this gap by providing a consistent dataset describing innovation in the public sector. Through a survey methodology it offers broad metrics identifying particular strengths and areas of concern across public innovation activities, organisational innovation capabilities, wider conditions for innovation and the impact of innovation in the public sector. It also allows for a statistical comparison between organisations. However, surveys of this kind can only offer headlines for how investment in innovation is viewed. More detailed analysis is required to unpick the subtle details of how innovation systems are supported or stifled within the public sector.

The strongest attempt to date to understand the operation of the public sector innovation system is reported within the background analysis which underpinned the *'Innovation Nation'* white paper produced by the Department for Innovation, Universities and Skills in 2008. However, as illustrated in the box below, this was a very high-level analysis of the strengths and weaknesses of public services as part of a broad analysis of the UK innovation system. It does not consider the operation of the system within the public sector, and offers no comment on how or why the system works well or where it could be strengthened. The potential power of applying a fine grained innovation systems approach to the public sector is illustrated in the second detailed case study below.

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<sup>22</sup> Hughes, Moore and Kataria (2011) Innovation in Public Sector Organisations

### **Innovation Nation background analysis – strengths and weaknesses of the UK innovation system**

The White Paper identified the following strengths and weaknesses from public services within the UK innovation system:

#### **Strengths:**

- Substantial investment in a high quality research base – as a share of GDP government funded research and development is broadly in line with leading OECD economies, although this remains below the figure in France, United States, Germany and Canada;
- Some world leading examples of new delivery of services and innovative policy making – such as e.g. Companies House electronic incorporation scheme, HM Land Registry e-conveyancing);
- Builds on strong culture of public management and efficiency – the UK was reported to be one of the earliest and most prominent adopters of the New Public Management;

#### **Weaknesses:**

- Incentives often work against innovation – in particular there appears to be an imbalance between risk and reward for innovating in public service delivery;
- Insufficient skills to innovate successfully;
- Weaknesses in spreading good practice – identification of significant barriers to dissemination;

Source: Innovation Nation background analysis (2008) Strengths and weaknesses of the UK innovation system

[http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/i/innovation\\_nation\\_background\\_analysis.pdf](http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/i/innovation_nation_background_analysis.pdf)

A limited appreciation of investment in intangible assets reflects a weak understanding of how the public sector invests in innovation, and how we can maximise the benefits from existing public sector assets. Equally, the poor application of the notion of an innovation system implies that there may be shortcomings in how support for innovation is understood within the public sector.

If we do not fully understand how current public spending supports innovation (either directly through investment in intangible assets or through support for the innovation

system) then there is a real risk that spending cuts may impact on this negatively. Also, without a strong understanding of the public sector innovation system we will find it difficult to invest effectively in the innovation required to respond to the changing circumstances of public services.

The following case studies aim to address this. The first focuses on the public sector intangible assets bound up within the UK's higher education sector – exploring how these are managed and exploited through international education exports. The second looks at how the NHS connects to the private sector and how well it supports a public-private innovation ecosystem within its supply chain.

## Case one – The UK’s international education market, managing public sector intangible assets

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In recent years the UK has been highly successful in attracting international students. In 2007/08 universities directly earned international revenues of £2.9bn and off-campus spending by international students totalled £2.2bn<sup>23</sup>. A report by Lenton (2007) suggested that a broader interpretation of international education boosted the UK economy by £28 billion in 2003/04 – though more recent estimates suggest that this figure could be as high as £40 billion<sup>24</sup>. If correct, this activity would be comparable to the income we receive from financial services, which stood at £43.9 billion in 2009.<sup>25</sup>

With a range of world-renowned educational institutions and international links forged through the Commonwealth, the UK stood to benefit in this growth market and, is now second only to the US in terms of the number of international students attracted each year. Given its clear importance, the UK must focus on remaining one of the key players in international education provision worldwide.

This trade should be viewed as a highly knowledge intensive, public sector dominated export activity. Success is based on the exploitation of public intangible assets – the brands, research expertise and intellectual and organisational capital embodied within our higher education institutions. This case study looks at the performance of the UK international education sector and its prospects for further growth. In this context it considers how well the public asset base is currently being managed and exploited.

### **The strength of the UK International Education Market**

Data from the Higher Education Statistics Agency (HESA) shows that in 2009/10 there were 405,800 non-UK students in the UK, accounting for 16.3 per cent of all students enrolled in higher education courses in the UK. Non-UK students play a particularly large role in postgraduate education, making up 35.5 per cent of all postgraduate students, compared to only 10.5 per cent of all undergraduates.

However, the number of international students studying within the UK dramatically underestimates the reach and significance of our international education exports. The UK is also a major player within Transnational Education (TNE) programmes. TNE reflects all forms of delivering educational programmes, award or credit bearing, by Higher Education Institutions (HEIs) in countries other than their own.<sup>26</sup> It covers twinning arrangements, franchising degrees, distance learning programmes and the collaborative delivery of dual degrees. Estimates for TNE programmes identify individuals registered on UK overseas campuses and students on twinning programmes registered with UK provider whilst in their home country. On this measure 200,600 students were enrolled in Transnational

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<sup>23</sup> Universities UK (2009) 'The impact of universities on the UK economy' accessible at: <http://www.universitiesuk.ac.uk/Publications/Documents/EconomicImpact4Full.pdf>

<sup>24</sup> Navitas (2011) Written evidence submitted to the Home Affairs Committee. Accessible at: <http://www.publications.parliament.uk/pa/cm201011/cmselect/cmhaff/773/773vw29.html>

<sup>25</sup> ONS (2010) Pink Book. Accessible at: <http://www.statistics.gov.uk/statbase/product.asp?vlnk=1140>

<sup>26</sup> For a detailed discussion of TNE please see DIUS (2008) Trans-national Education and Higher Education Institutions: Exploring Patterns of HE Institutional Activity. Accessible at: [http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/d/dius\\_rr\\_08\\_07.pdf](http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/d/dius_rr_08_07.pdf)

Education (TNE) programmes in 2009/10; 129,100 at undergraduate level and 71,400 at postgraduate. However, the true figure for TNE is likely to be significantly higher.

The UK Council for International Student Affairs (UKCISA) suggest that universities earned £2.5 billion from international student fee income alone, representing between 10 and 30 per cent of the majority of universities' income in 2008/09. A further £2.5 billion is spent on goods and services in local communities while accounting for private sector colleges would increase these figures significantly<sup>27</sup>. Hence, the direct impacts of international students on universities and the wider economy are sizeable and offer a significant incentive for the UK to guard and improve its market share.

### **Success maintaining share in a growing market**

Historical data on TNE is currently unavailable, but international student numbers collected by the OECD<sup>28</sup> show that the UK has performed well and succeeded in maintaining its position through a period of significant market expansion.

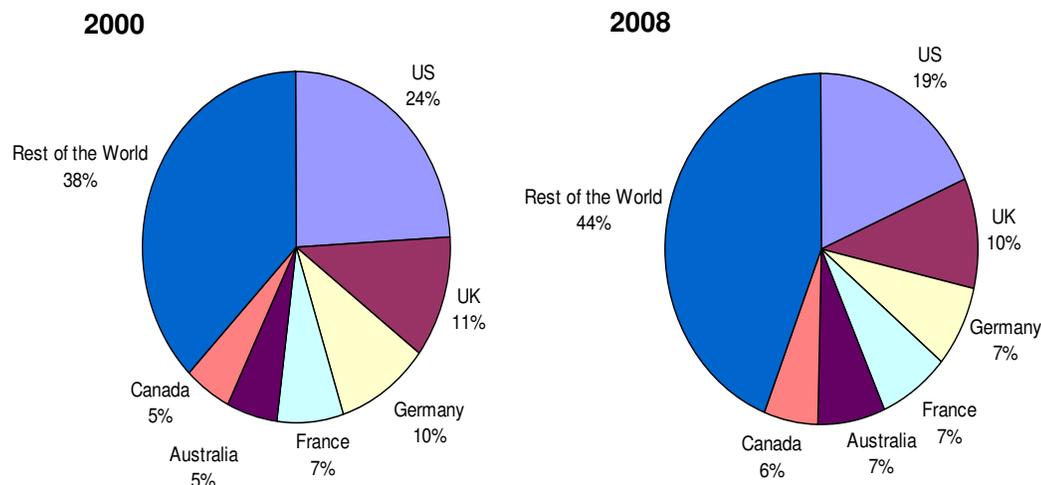
The international education market has traditionally been dominated by Anglophone countries, with 4 of the 6 largest providers being the US, UK, Australia and Canada. However, the strong growth (70 per cent between 2000 and 2008) has attracted new entrants – particularly from East Asia. For example, the number of international students in Korea has risen from 3,400 in 2000 to 40,300 in 2008, implying a staggering annual growth rate of 40.6 per cent.

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<sup>27</sup> UK CISA (2010) International students in the UK: Facts, figures – and fiction. Accessible at: [http://www.ukcisa.org.uk/files/pdf/about/international\\_education\\_facts\\_figures.pdf](http://www.ukcisa.org.uk/files/pdf/about/international_education_facts_figures.pdf)

<sup>28</sup> OECD (2010) Education at a Glance. Accessible at: [http://www.oecd.org/document/52/0,3746,en\\_2649\\_39263238\\_45897844\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/52/0,3746,en_2649_39263238_45897844_1_1_1_1,00.html)

Figure 4: Market share of international students by destination (2000 and 2008)



Source: OECD (2010) Education at a Glance

Over this same period the market share of the six largest providers of international education has fallen from 62.1 per cent to 55.7 per cent (see Figure 4). Despite this, the UK's position has remained reasonably consistent, with a slight drop from 11.3 per cent in 2000 to 10.0 per cent in 2008. By comparison the US has seen its market share reduce rapidly from 24.1 per cent to 18.7 per cent over the same period.

More up to date data available from HESA suggests that UK is continuing to perform strongly with admissions of non-UK students up 10.0 per cent in 2009/10 on the year before. EU domiciled students had increased 6 per cent and admissions from non-EU countries (predominantly Asian countries) rose by 12 per cent. TNE also showed an increase of 5.2 per cent between 2008/09 and 2009/10. This suggests that the UK international education sector is in good health.

### Explaining the UK's strong performance

A number of explanations have been offered for why the UK has performed quite so well while destinations in other advanced destinations have faltered. The performance appears to relate to the complementary combination of the following factors:

- Brands** – The UK is blessed with a wide range of educational institutions, some of which have been established for hundreds of years and have developed reputations of excellence. Of the Top 200 World University Rankings, the UK has 29 institutions, far exceeding Germany, France, Canada and Australia – although

the UK is dwarfed by the US which has 72 institutions in the top 200<sup>29</sup>. Therefore, the UK may have a distinct advantage over its main competitors in terms of brand equity as these universities may “sell themselves” to international students wishing to study in institutions at the forefront of their subject areas.

- **Research excellence** - In 2008, 87 per cent of research undertaken in UK institutions was deemed of international significance, with 150 of the 159 participating institutions having some work of world-leading quality<sup>30</sup>. Furthermore, a report by Evidence found that the UK was second only to the US in terms of academic citations, receiving 11.8 per cent of formal references by other academics and reflecting the superior quality of UK research output<sup>31</sup>. As a result, successful institutions may attract more international students as research statistics act as a form of signalling of a quality, vibrant research environment while favourable RAE ratings also allow the institutions to receive more research funding. As could be expected, research quality was reported to have a particularly large influence over the destinations of postgraduate research students.<sup>32</sup>
- **Institutions** - The UK's mature institutional environment may be beneficial for providing education to international students. For instance, the UK has the Quality Assurance Agency (QAA), the Higher Education Funding Council for England (HEFCE), the British Council and the UK Council for International Student Affairs (CISA) amongst others. These institutions support, encourage and provide information for prospective international students to allow them to make an informed decision regarding the destination of their studies.
- **Course offer** – The length of courses may be a particular benefit of a UK education. When studying full-time, the majority of undergraduate courses in the UK are expected to take 3 years to complete while the average Masters Degree will take 1 year to complete. In other competitor countries, these courses can last for 4 and 2 years respectively and act to delay the students' transition to working life. Thus, the greater study intensity means that it costs less for students to complete their studies in the UK while the quality of provision is still very high<sup>33</sup>.
- **Specific host characteristics** - The international student experience is about more than just the degree, with international students wanting to develop intellectually while also having the opportunity to access a high class “student experience”. 51.5 per cent of international students cited the opportunity to live overseas and experience a new culture as a key determinant in the choice of

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<sup>29</sup> Times Higher Education (2010) World University Rankings. Accessible at:

<http://www.timeshighereducation.co.uk/world-university-rankings/2010-2011/top-200.html>

<sup>30</sup> Research Assessment Exercise (2008) Accessible at: <http://www.rae.ac.uk/news/2008/results.asp>

<sup>31</sup> Evidence (2009) International Comparative Performance of the UK Research Base. Accessible at:

[http://www.bis.gov.uk/assets/biscore/corporate/migratedD/publications/I/ICPRUK09v1\\_4](http://www.bis.gov.uk/assets/biscore/corporate/migratedD/publications/I/ICPRUK09v1_4)

<sup>32</sup> Universities UK (2008) The UK's competitive advantage: the market for international research students. Accessible at:

<http://www.international.ac.uk/resources/The%20UK's%20Competitive%20Advantage.The%20Market%20for%20International%20Research%20Students.pdf>

<sup>33</sup> Source: [http://uk.internationalstudent.com/study\\_uk/why\\_study\\_uk/](http://uk.internationalstudent.com/study_uk/why_study_uk/)

location. With a rich cultural and historical heritage that offers the student the ability to broaden their social and cultural horizons, the UK may have a notable advantage in this area. Improving career prospects is also important when factoring study destinations, influencing the decisions of 53.8 per cent of international students. Therefore, the option to work in the UK post-study may also be of significance here. In addition, the UK has a strong and easily accessible transport networks, affording international students the ability to experience neighbouring countries at a low cost, and is a multicultural society that is open to other cultures and traditions – this may be an attractive prospect for international students.

### Prospects for growth

As a consequence of the rapid growth in the developing world, particularly in China and India, we have seen the emergence of the “global middle class” – a group of individuals who can afford, and demand access to, the standards of living previously reserved mainly for the residents of developed countries (Bussolo *et al*; 2007). A key manifestation of this demand is in the desire to send their children to globally renowned universities. There is potential for the number of international students to increase very strongly in the near-term as this group expands.

Analysis of the destinations of students from growing markets suggests we can be optimistic about the UK's future prospects. Table 3 shows the destinations of students from the countries which saw the greatest expansion between 2001 and 2008. The UK is seen to perform well in attracting international students from these markets, particularly in Malaysia, Nigeria and Pakistan. However, perhaps due to geographical proximity, Australia outperforms the UK in the major markets of China and India.

**Table 3: The destinations of international students from**

		Destination						
		Australia	Canada	France	Germany	UK	US	Rest of the world
Origin	<b>China</b>	11.3	7.1	4.1	5.0	8.9	21.6	42.1
	<b>India</b>	14.4	5.6	0.6	2.0	14.0	51.2	12.3
	<b>Iran</b>	2.9	14.9	4.3	10.1	6.0	7.7	54.1
	<b>Malaysia</b>	36.1	1.6	1.2	1.7	22.8	10.6	26.0
	<b>Nigeria</b>	0.6	6.7	0.6	2.0	43.5	23.0	23.6
	<b>Pakistan</b>	7.5	14.8	1.6	4.0	28.3	16.3	27.6
	<b>Saudi Arabia</b>	7.8	4.6	1.1	0.3	14.3	40.1	31.8
	<b>Thailand</b>	17.6	1.6	3.0	3.7	16.1	34.7	23.2
	<b>Vietnam</b>	14.3	3.0	13.5	9.5	4.7	23.1	31.9
	<b>Zimbabwe</b>	4.0	1.3	0.0	0.2	5.5	3.9	85.1
	<b>Total (growth markets)</b>	<b>12.3</b>	<b>6.5</b>	<b>3.2</b>	<b>4.2</b>	<b>12.1</b>	<b>26.1</b>	<b>35.5</b>
	<b>Total (World)</b>	<b>6.9</b>	<b>5.5</b>	<b>7.3</b>	<b>7.3</b>	<b>10.0</b>	<b>18.7</b>	<b>14.2</b>

Source: OECD (2010) Education at a Glance

Forecasts suggest that the number of international students enrolled on HE programmes will reach 7 million in 2025 while the demand for HE programmes from the UK is forecast to grow from 200,000 in 2003 to 1.4 million in 2025<sup>34</sup>. Therefore, these forecasts show clear potential for the UK to benefit on an increasing scale in the international education market looking forward.

However, the potential of the UK to attract students is likely to be tempered by the focus of these countries towards developing their own educational facilities. China has recently focused on promoting ten “elite” universities, which receive significant public sector

<sup>34</sup> British Council (2004) Vision 2020: Forecasting International Student Mobility – A UK perspective. Accessible at: [http://www.britishcouncil.org/eumd\\_-\\_vision\\_2020.pdf](http://www.britishcouncil.org/eumd_-_vision_2020.pdf)

funding in order to elevate them to world-class institutions. All Chinese institutions are also now subject to extraordinary pressures to move up the objective world rankings tables through increasing publications, citations and international cooperation. Research spending in China and India is growing rapidly and already impacting on performance – China's share of world publications increased from two per cent in 1996<sup>35</sup> to nearly ten per cent in 2008.<sup>36</sup> The concern is that in the long term, fewer students in countries such as China will feel the need to travel for higher education as the quality of domestic provision will be adequate. Programmes of TNE, where established universities (predominately British and American) link to and support the development of international partners, may accelerate this process.

At the same time, the quality of international competition for students appears to be increasing. As set out in the box below, many countries have actively invested in their higher education institutions as a response to the economic crisis. Others have been focusing on how to make their offer more attractive - for example Germany (identified recently has the most supportive environment for international students) has been actively looking to increase its attractiveness by proving a greater proportion of programmes in English<sup>37</sup>.

### **The Global Picture – the international response to the global recession**

The Global Economic Crisis has left governments severely restricted, as countries many countries are experiencing burgeoning budget deficits and mounting debts. Against this backdrop, the governments have to perform a difficult balancing act between cutting public expenditures to satisfy capital markets and encouraging economic growth. With education sector relying heavily on government funding, this has had a profound effect upon different countries' HE policies.

- The US and Canada have targeted HE as an area for budget cuts at state/provincial level. As a result, US universities in some states have been unable to meet the increasing demand for places and are operating under full capacity and cutting staff numbers.
- Some countries, including China, India and Malaysia, have continued to accelerate pre-recession HE investment levels. In India, the government's aim is to increase its GDP spend on HE from 0.4 per cent to 1 per cent while China continues to focus money on the HE sector which has seen massive growth in the last decade. As part of its economic stimulus package, in 2009 the Malaysian Government launched the MyBrain15 Initiative, aiming to produce 60,000 PhD holders by 2020 and encouraging postgraduate study.

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<sup>35</sup> Universities UK (2007) Global Opportunities for UK Higher Education. Accessible at: <http://www.international.ac.uk/resources/Global%20Opportunities%20for%20UK%20Higher%20Education.pdf>

<sup>36</sup> Times Higher Education (2009) China ousts UK in academic research ranking. Accessible at: <http://www.timeshighereducation.co.uk/story.asp?storycode=408525>

<sup>37</sup> BBC (2011) Germany top for foreign students. Accessible at: <http://www.bbc.co.uk/news/business-12610268>

- The UK's main competitors – Australia, Canada, France, Germany and the US – all have increased public sector funding for HE to stimulate economic growth. For instance, the US federal stimulus package provided £25.25 billion to lessen spending cuts in healthcare and education, Canada promoted a £2.5 billion Knowledge Infrastructure Programme to improve critical research and teaching infrastructure in HE institutions and France allocated £10.7 billion to HE and research activities.

Source:

<http://www.universitiesuk.ac.uk/Publications/Documents/TheGlobalPicture20100907.pdf>

Investment in higher education also appears to be a development focus of many oil rich states. For example Qatar has recently invested billions of pounds of its hydrocarbon earnings to develop a 2,500 acre educational hub for 80 educational, research, science and community development organisations. This hub has developed links with leading international universities.<sup>38</sup> In such locations the business model of higher education can be fundamentally different – for instance, the United Arab Emirates University offers monthly stipends for those studying engineering and science degrees that increase throughout the duration of the programme, while also waiving tuition fees and accommodation costs<sup>39</sup>.

Looking forward, there is great potential for the UK to continue to build on current strengths and continue to create value as a provider of international education by meeting growing demand for high quality higher education. However, it is also clear that competition for students has increased substantially over the past decade and will continue to strengthen – Universities UK have concluded that in the face of this competition “it is inevitable that there will be some decline in UK market share”<sup>40</sup>. Maintaining the position of the UK as a leading provider of international education is likely therefore to demand increased investment and strong management. The remainder of this case study assesses the extent to which this is being put in place.

### **How well is the UK managing the intangible assets in its educational establishments?**

The ability of universities to maintain their stock of intangible assets and remain competitive in the global market is contingent upon sustained investment in the resources available to the higher education sector.

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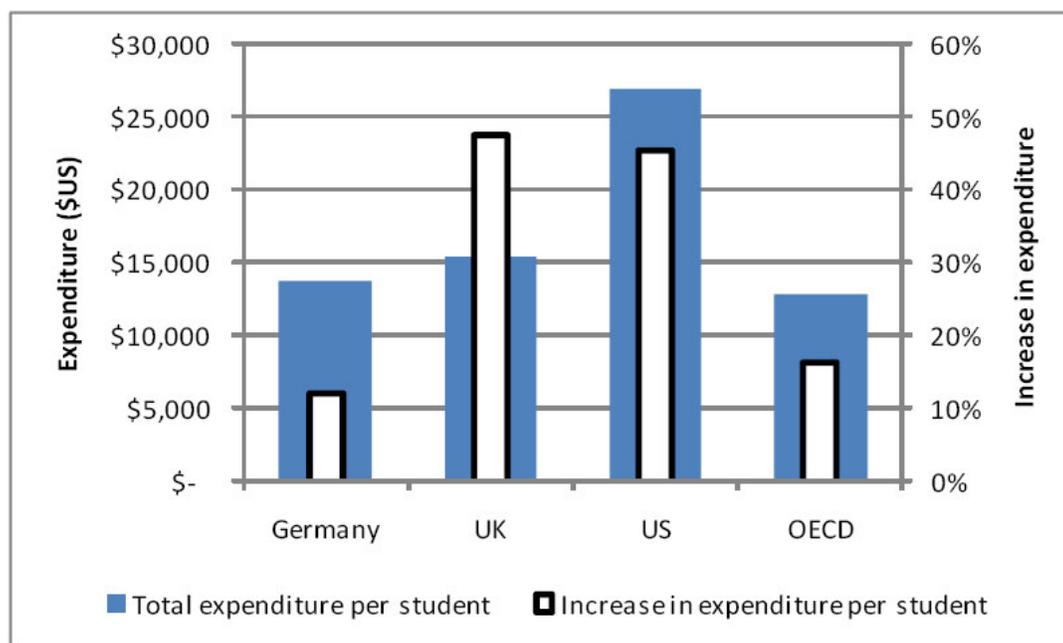
<sup>38</sup> BBC (2011) Turning knowledge into the new oil. Accessible at: <http://www.bbc.co.uk/news/business-12680358>

<sup>39</sup> Jones (2009) Attracting engineering students to oil-rich Middle East countries. Accessible at: [http://www.worldexpertise.com/attracting\\_engineering\\_students.htm](http://www.worldexpertise.com/attracting_engineering_students.htm)

<sup>40</sup> Universities UK (2008) The UK's Competitive Advantage: The Market for International Research Students. Accessible at: <http://www.international.ac.uk/resources/The%20UK's%20Competitive%20Advantage.The%20Market%20for%20International%20Research%20Students.pdf>

As illustrated in Figure 5 and explored in detail within the recent Knowledge Economy paper *Shaping Up for Innovation*<sup>41</sup> UK institutions have enjoyed strong funding growth in recent years, and expenditure per student increased strongly between 1995 and 2007.

**Figure 5: Expenditure on tertiary education in Germany, UK and US (per student and increase per student between 1995 and 2007)**



Note: Expenditure in 2000 US\$ adjusted by purchasing power parity

Source: OECD

While it is clear that these funding increases will not be sustained in the current fiscal climate, unpicking the details of current and future funding for the sector is a highly complex task – the box below sets out the most important recent changes:

<sup>41</sup> Levy, C. and Hopkins, L. (2010) *Shaping Up for Innovation*, The Work Foundation. Accessible at: <http://www.theworkfoundation.com/Assets/Docs/Publications/Skills%20report%20-%20FINAL.pdf>

### Recent Changes to Higher Education Funding

- **The Higher Education Funding Council (HEFCE)** have now confirmed a reduction in their overall grant of £940m (12.6 per cent) for 2011/12 compared to the previous year<sup>42</sup>. Capital funding is to be hit especially hard (58.1 per cent), teaching will be asked to find savings of 8.2 per cent while in comparison, research will be shielded from the deepest cuts (only 2.8 per cent). This reduction is in addition to a cut of £190m for the current academic year<sup>43</sup> and an £82m reduction on allocations for 2009/10 announced last June<sup>44</sup>.
- **The Spending Review** –The Spending Review outlined a reduction in the HE budget (excluding research) from £7.1 billion in 2010/11 to £4.2 billion in 2014/15 – a 40 per cent reduction. Spending on science and research was ring-fenced up to 2014/15 at £4.6 billion, although when allowing for inflation this implies a 9 per cent fall over the period<sup>45</sup>. The Government will provide £200 million a year by 2014/15 to support manufacturing and business development, of which a significant amount will be used to form an elite network of R&D intensive technology and innovation centres.
- **The 2011 Budget** – the government announced £100 million for 2011/12 in science capital development, with a view to provide facilities for the commercialisation of research, accommodation for innovative SMEs and new research capabilities.
- **Tuition Fee increases** – from 2012/13 onwards there will be a dramatic shift in the balance of funding for higher education away from grant funding towards tuition fees. The final impact of these reforms on the income of all higher education institutions is hard to predict – it will depend on the final mix of fees charged and the generosity of packages to promote access<sup>46</sup>. However, it does now seem likely that the change may increase the income of many of the most prestigious universities in the sector. This may correspond closely to the universities which have traditionally drawn income from international education.

On balance therefore, it is very hard to predict the final scale of reductions in the funding available to higher education institutions. This should be viewed as a cause for concern – if our international education sector is to be sustained then we need to have strong, stable

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<sup>42</sup> Note: figures include the ending of £255m of special one-off payments as part of the University Modernisation Fund. Source: HEFCE (2011) Press Release: £6.5 billion announced for universities and colleges in England. Accessible at: <http://www.hefce.ac.uk/news/hefce/2011/grant1112/>

<sup>43</sup> Also confirmed in HEFCE (2011) Press Release: £6.5 billion announced for universities and colleges in England

<sup>44</sup> HEFCE (2010) Higher Education Funding 2010-11 Grant Letter. Accessible at: <http://www.hefce.ac.uk/news/HEFCE/2010/grant1011/revised.htm>

<sup>45</sup> Universities UK (2010) The future funding of higher education: A briefing for Parliamentarians. Accessible at: <http://www.universitiesuk.ac.uk/ParliamentaryActivities/Documents/UUKFundingHigherEducation.pdf>

<sup>46</sup> See for example HEPI (2010) The government's proposals for higher education funding and student finance – an analysis, for a detailed investigation of the issue.

and predictable funding in our higher education institutions. In the medium term, it is a particular worry that capital investment appears to be being cut sharply. This is in sharp contrast to our main competitors in Australia, Canada, France, Germany and the US who have all increased public sector funding for HE in response to the Global Economic Crisis<sup>47</sup>.

### **How well is the UK exploiting the intangible assets in its educational establishments?**

Maintaining the UK's position within increasingly competitive international education markets will depend not only on the continued development of higher education assets, but also on the successful marketing and packing of the broad UK higher education offer for international students. The government also plays a central role here.

The UK Government has acknowledged the importance of international education on cultural, political and financial grounds by launching the two waves of the Prime Minister's Initiative (PMI), the first of which happened in 1999. The PMIs have looked to encourage more international education through several channels: marketing UK education under an umbrella brand, streamlining entry procedures into UK institutions, providing numerous scholarships, developing strategic overseas partnerships and diversifying and consolidating markets. All the while, the PMIs have strived to hit targets for increasing the number of international students in higher and further education institutions in the UK, through which the stock of intellectual capital in UK educational establishments may increase. This can be seen as facilitating greater research and development, technological growth and innovation.

Under the Prime Minister's Initiative the Department for Universities, Innovation and Skills (DIUS, now BIS) set up Education UK, a marketing strategy to encourage students considering an overseas education to choose the UK as their destination. Through Foreign and Commonwealth Office funding and management by the British Council, the Education UK brand has been licensed to 370 institutions and is marketed in 85 countries.

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<sup>47</sup> PWC (2010) The Global Picture. Accessible at:  
<http://www.universitiesuk.ac.uk/Publications/Documents/TheGlobalPicture20100907.pdf>

### **Universities UK International Strategy**

Through their international remit, Universities UK seeks to maintain and build on UK institutions' success in international education provision in a number of ways:

- Engage in European HE policy decision making – Due to the degree of integration between the UK and the EU, policy legislation passed in the EU has a direct effect upon UK education. Education UK therefore seeks to engage in the policy-making process and act as an observatory on behalf of UK institutions, through which there may be greater opportunities for collaboration and funding options.
- Ensure that the good reputation, quality and international success of UK institutions are sustained, strengthened and developed by promoting the UK institutions' international activities worldwide through media activities, events and promotions.
- Continuation of national marketing strategy – Work with a range of institutions to ensure that the advantages of the PMIs and the Education UK brand are built upon, and that the UK meets the challenges posed by the projected increases in international student numbers. This may be through: promoting the exchange of staff/students internationally, encouraging academic transfers and engaging with public/private international bodies.
- Develop and promote good practice in recruitment and admission of international students – support universities in providing an excellent “student experience” – educationally, socially and culturally – for international students.
- Maintain and develop strong links with key external partners and stakeholders - Improve communications and sharing of information to foster mutually beneficial relationships, ensuring maximum value and effectiveness for UK HE.

Source: <http://www.universitiesuk.ac.uk/Publications/Documents/intlstrategy.pdf>

Research conducted by CHEMS Consulting identified that UK universities are increasingly focusing upon the implementation of effective management structures to maximise the benefits of internationalisation. The role of senior leadership in developing and promoting the importance of the international strategy is widely recognised within institutions. An effective top-down international strategy may have a significant effect on the institutional culture, embedding internationalisation at the heart of the universities' activities. HE establishments are also exploiting their intangible assets through internationalising the curriculum, ensuring that the modules are inclusive, culturally responsive and placing subjects in a global context. However, the research concluded that, for a culture of internationalisation to become embedded, universities must invest a considerable amount

of time and resources, and have effective communication strategies in place to ensure clarity.<sup>48</sup>

In this sense, the UK does seem to be marketing itself well as a destination for international students. Although there are concerns over the future of this funding - significant funding from the second wave of the Prime Minister's Initiative due to end in 2011 and development-focused funding from DFID will also be coming to an end soon.<sup>49</sup>

However, attracting international students depends on more than a marketing strategy. As noted above, the attractiveness of the UK as a place to study depends on a broad range of factors which together represent the package offered by a single location. Recent changes to UK visa policy may impact negatively on this package, and therefore the attractiveness of the UK to foreign students.

The recent announcement of a reduction in the number of Tier 4 visas may make it harder to maximise the potential from international students. Tier 4 visas allow entry for tuition in the UK. Allowances had previously been generous, and two waves of the Prime Minister's Initiative had looked to streamline the visa process to allow easier access to a UK education. However, under the new restrictions, the government is seeking to reduce the number of non-EU students receiving Tier 4 visas significantly from the 180,000 issued in 2009<sup>50</sup>. Other changes also include more rigorous language requirements and only permitting only postgraduate and government-sponsored international students on programmes lasting longer than 6 months to bring their families across with them<sup>51</sup>.

These restrictions may have a great effect on students on pre-university pathway courses. HEPI have suggested that this could result in a loss of £1 billion in fee income before other contributions to the economy are considered<sup>52</sup>.

The government have also announced changes to Tier 1 visas – known as the Post-Study Work Route. A key directive of the Prime Minister's Initiatives was to increase post-study work options for international students, as these were found to be a major determinant of the destination of international students. However, under the changes announced by the Home Secretary on March 22<sup>nd</sup> <sup>53</sup> the Post-Study Work Route will be closed from April

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<sup>48</sup> CHEMS Consulting (2008) The Practice of Internationalisation: Managing International Activities in UK Universities, Published by Universities UK. Accessible at: <http://www.international.ac.uk/resources/The%20Practice%20of%20Internationalisation.%20Managing%20International%20Activities%20in%20UK%20Universities.pdf>

<sup>49</sup> Million+ (2011) International Education: A Missed Opportunity? Accessible at: <http://www.millionplus.ac.uk/research/index>

<sup>50</sup> BBC (2011) Education leaders unite against student visa cuts plan. Accessible at: <http://www.bbc.co.uk/news/education-12296161>

<sup>51</sup> House of Commons Home Affairs Select Committee (2011) Student Visas: The seventh report of the session 2010-11. Accessible at: <http://www.parliament.uk/documents/commons-committees/home-affairs/Studentvisas.pdf>

<sup>52</sup> Acton (2011) The UKBA's Proposed Restrictions on Tier 4 visas: implications for University recruitment of overseas students. Accessible at: <http://www.hepi.ac.uk/466-1934/The-UKBA%E2%80%99s-Proposed-Restrictions-on-Tier-4-visas-implications-for-University-recruitment-of-overseas-students.html>

<sup>53</sup> Statement on student visas. Accessible at: <http://www.parliament.uk/business/news/2011/march/statement-on-student-visas/>

2012 and only international students who have obtained jobs with government-sponsored employers with a salary of £20,000 or above will be allowed to remain in the UK<sup>54</sup>.

Cancelling the Post-Study Work Route may have a profound effect on the attitude of international students towards a UK education. The London School of Business Finance propose that students decide where to study based upon: the quality of programme, the benefits of the location and the prospects for employment. Therefore restrictions on the Post-Study Work Route may cause international students to favour competitor countries who offer better, less restrictive employment prospects.

These changes are occurring against a backdrop of a broad tightening of immigration policy. In response to a Conservative election manifesto pledge to cut net migration from around 200,000 to tens of thousands by 2015,<sup>55</sup> other visa requirements are being increased. A cap on the total number of skilled workers allowed to seek work in the UK of 20,700 has been introduced. Skilled workers from outside the EU on intra-company transfers are now also subject to a minimum salary threshold of £24,000 for the first year<sup>56</sup>.

Considered together, these visa restrictions may have a detrimental effect on the UK educational brand. Along with the US, the UK was previously perceived to be the most difficult country in which to obtain a visa to study<sup>57</sup>. Changes here could result in the brightest students increasingly being drawn towards more welcoming countries such as Canada and Germany. The scale of the risk here is highlighted by Australian experience – enrolments of Chinese students fell by between 10 and 20 per cent when the government imposed stricter immigration controls based upon financial status and English proficiency. It was estimate that this represented a loss of approximately \$5bn.<sup>58</sup>

Taken together, there are worrying signs for international education in the UK. The Government state an awareness of the importance of international education – indeed David Willetts, the Minister of State for Universities and Science, recently professed: “I am very clear that our commitment to reduce net migration has to be implemented without putting at risk our higher education exports – a business which Vince Cable and I regard as a major British success story and testament to the international reputation of our

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<sup>54</sup> UKBA (2010) The student immigration system: A consultation. Accessible at: <http://www.ukba.homeoffice.gov.uk/sitecontent/documents/policyandlaw/consultations/students/student-consultation.pdf?view=Binary>

<sup>55</sup> BBC (2011) MPs warn student visa proposals could 'cripple' sector. Accessible at: <http://www.bbc.co.uk/news/education-12764476> Speaking recently David Cameron also restated his “aim to reduce net migration to the levels seen in the 1980s and 1990s” BBC (2011) In full: David Cameron immigration speech. Accessible at: <http://www.bbc.co.uk/news/uk-politics-13083781>

<sup>56</sup> Home Office (2011) Press Release: Government outlines visa reforms for workers. Accessible at: <http://www.homeoffice.gov.uk/media-centre/press-releases/visa-reforms>

<sup>57</sup> Universities UK (2008) The UK's competitive advantage: The market for international research students. Accessible at: <http://www.international.ac.uk/resources/The%20UK's%20Competitive%20Advantage.The%20Market%20for%20International%20Research%20Students.pdf>

<sup>58</sup> The Australian (2010) Decline in China numbers to persist. Accessible at: <http://www.theaustralian.com.au/higher-education/decline-in-china-numbers-to-persist/story-e6fgcix-1225971169872>

institutions”<sup>59</sup>. However, the government actions set out above appear to contradict this positive message. The think-tank Million+ have gone as far as to argue that such a fragmented and contradictory approach from the government towards international education risks undermining the reputation of UK higher education overseas<sup>60</sup>.

### Implications

The international education sector must be viewed as a highly knowledge intensive export sector, one in which we have been particularly successful in the recent past. The sector creates value by exploiting the public sector intangible assets bound up within our higher education institutions. How we choose to manage and exploit these assets will determine the future strength of this activity.

Unfortunately, there are significant limitations on our current performance here. Despite public recognition of the importance of international education, policy does not appear to be offering clear backing for these activities – future funding of the sector remains uncertain, and action on visas risks sending the wrong signals to prospective students. Making the most of these public services will demand a truly unambiguous commitment to support the management and exploitation of the public sector intangible assets within our higher education system.

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<sup>59</sup> David Willetts (2011) Speech at Universities UK Spring Conference. Accessible at: <http://bis.gov.uk/news/speeches/david-willetts-uuk-spring-conference-2011>

<sup>60</sup> Million+ (2011) International Education: Missing an Opportunity

## Case two – The NHS and the healthcare sector, managing a broad innovation ecosystem

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The NHS is already facing many of the challenges that the wider public sector will soon be forced to confront. It represents a highly knowledge intensive area of activity where productivity growth has been poor in recent years. Significant financial constraints are being imposed on its activities, and it is facing significant reform in terms of how the NHS connects to the private sector. The NHS therefore represents an opportunity to study how our public sector connects to private industry to drive innovation at a time of particular stress.

### The NHS / healthcare sector in numbers

By way of context the following data points illustrate the scale of the NHS, its spending power, and its significance for the wider economy:

- **Public Spending** – public sector expenditure on health (National Statistics grouping) in the financial year 2008-09 was £109.97 billion (PESA (2010)). Available at: [http://www.hm-treasury.gov.uk/d/pesa\\_2010\\_tables\\_chapter5.xls](http://www.hm-treasury.gov.uk/d/pesa_2010_tables_chapter5.xls)). For the calendar year 2009 the ONS have recently identified a significant increase in spending to £114.8bn, up from £104.6bn in 2008 (ONS (2011) Expenditure on healthcare in the UK. Available at <http://www.statistics.gov.uk/articles/nojournal/healthcare-expenditure-may2011.pdf>);
- **Private Spending** – private sector expenditure on healthcare stood at £21.6 billion in 2009 (ONS(2011) Expenditure on healthcare in the UK. Available at <http://www.statistics.gov.uk/articles/nojournal/healthcare-expenditure-may2011.pdf>);
- **NHS Staffing** – in September 2010 NHS staff totalled 1.4m headcount and 1.2m on a full time equivalency basis. (DoH <http://www.ic.nhs.uk/statistics-and-data-collections/workforce/nhs-staff-numbers>);
- **Wider employment in healthcare** – 3.5m employed in the human health, residential care and social work sectors in Great Britain during 2009 (BRES data. Available at [www.nomisweb.com](http://www.nomisweb.com));
- **Public procurement** – the following data points offer snapshots of public procurement from different perspectives:
  - The Department of Health's Innovation Strategy estimated that procurement in 2009/10 totalled £34bn (DoH (2009) National Innovation Procurement Plan);
  - ONS data estimates that spending on goods and services within politically funded healthcare was £46.9bn in 2010 (ONS (2011) Public Service Output, inputs and productivity:

### Healthcare

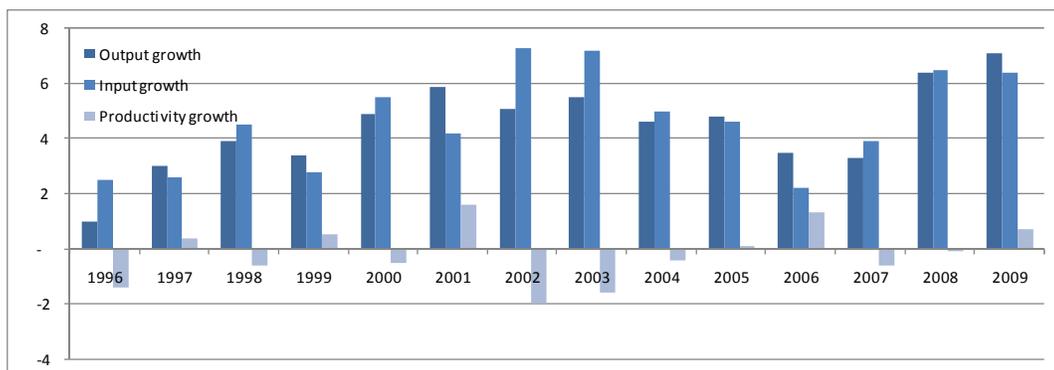
<http://www.statistics.gov.uk/articles/nojournal/HP11-summary.pdf>);

- The Treasury PESA tables suggest that in 2008/09 £71bn was spent on gross capital and gross current procurement (HM Treasury (2010) [www.hm-treasury.gov.uk/d/pesa2010\\_tes\\_interactive\\_tables.xls](http://www.hm-treasury.gov.uk/d/pesa2010_tes_interactive_tables.xls)); and
- Treasury Combined On-line Information System (COINS) data identifies purchases of goods and services by the Department of Health totalling £54bn in 2008/09 (HM Treasury data access via the Guardian on-line tool - <http://coins.guardian.co.uk/coins-explorer/search>).

### The NHS's productivity challenge

Data from the ONS shows that publically funded healthcare provision has performed poorly in productivity terms in recent years. Figure 6 below illustrates that, as for wider public services, the increased investment and spending on public healthcare over the past decade does not appear to have boosted productivity. The raw data does appear to suggest that labour productivity has increased in recent years. However, the ONS suggest that this is likely to be due to the increasingly technical and product oriented nature of healthcare and the greater embodiment of labour inputs within the goods and services purchased by public healthcare, rather than efficiency gains made by the NHS.<sup>61</sup>

**Figure 6: Growth in healthcare output, inputs and productivity, 1995-2008**



Source: ONS (2011) Public Service Output, inputs and productivity: Healthcare  
<http://www.statistics.gov.uk/articles/nojournal/HP11-summary.pdf>

<sup>61</sup> Established through telephone contact with ONS officials from the UK Centre for the Measurement of Government Activity (UKCeMGA).

A number of alternative factors appear to have contributed to this generally poor performance. Much of the increased spending appears to have fuelled price increases – KPMG reflect “that 45% of the new money was consumed by self-inflicted inflation, where more was paid for the same output”<sup>62</sup>. McKinsey attribute much of the productivity challenge to variations in performance across the NHS – they estimate that savings of £1.9-£3bn could be made if acute providers who are currently performing below the median reduced this gap by 50-80 per cent.<sup>63</sup> Finally, it appears that NHS managers are still not particularly focused on driving innovation. In a study of NHS hospital productivity, the National Audit Office reported that NHS managers “concentrated on meeting national performance targets whilst maintaining financial balance, and not specifically on optimising productivity”<sup>64</sup>.

The modest spending increases provided for the NHS in the Spending Review<sup>65</sup> will present a significant challenge for the organisation. Figure 7 below illustrates how dramatic a break with the past this will represent. It is a particular issue since forecasts show sustained increasing demands being placed on NHS services. Predicting similarly modest increases in NHS budgets, the Chief Executive of the NHS, Sir David Nicholson forecast a shortfall in spending of £15-20bn across the service to “deal with changing demographics, the implementation of the regional visions and cost pressures in the system”.<sup>66</sup> These cost pressures relate to the costs of complying with guidance from the National Institute for Health and Clinical Excellence (NICE), assumptions about workforce and pay, and the costs of policies recently announced, but not yet implemented.<sup>67</sup> Research conducted by the King’s Fund has also identified a potential shortfall similar in scale<sup>68</sup>.

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<sup>62</sup> Downey, Kirby, and Sherlock (2010) Payment for Success, KPMG

<sup>63</sup> McKinsey (2009) Achieving World Class Productivity in the NHS 2009/10 – 2013/14: Detailing the size of the opportunity. Accessible at <http://www.guardian.co.uk/society/interactive/2010/jun/02/mckinsey-report-future-nhs>

<sup>64</sup> National Audit Office (2010) Management of NHS hospital productivity

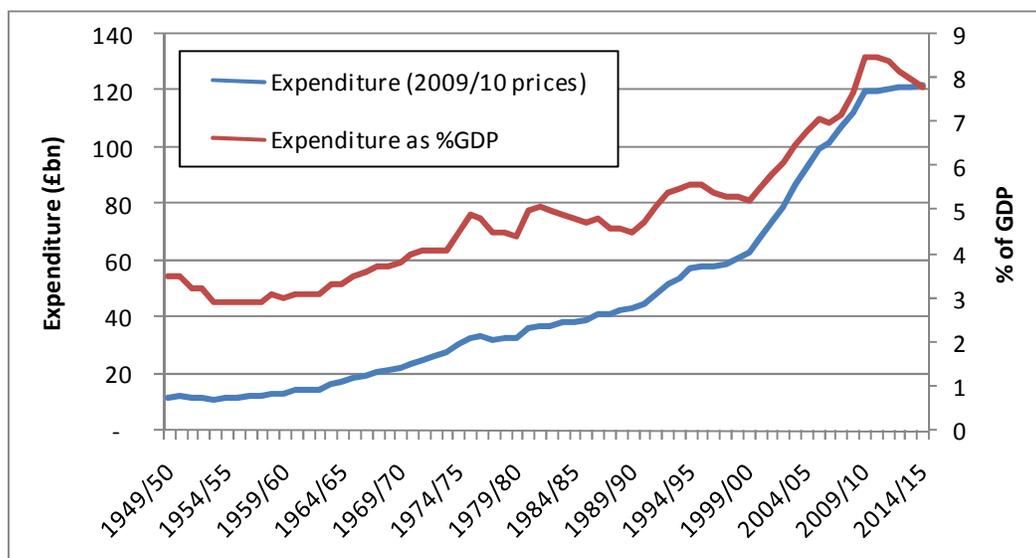
<sup>65</sup> The Department of Health’s final settlement within the Spending Review allows for a 0.4 per cent increase in real terms between 2010/11 and 2014/15. This includes a 1.3% increase in the resource budget, and a 17% decrease in capital spending. The administration budget will be reduced by 33%, and reinvested to support the delivery of NHS services. Source: [http://www.dh.gov.uk/en/MediaCentre/Pressreleases/DH\\_120676](http://www.dh.gov.uk/en/MediaCentre/Pressreleases/DH_120676)

<sup>66</sup> Nicholson (2009) The Year: NHS Chief Executive’s annual report 2008/09

<sup>67</sup> Health Select Committee (2010). Minutes of Evidence HC269-ii (2010–11).

<sup>68</sup> Appleby, Crawford and Emmerson (2009) How Cold Will it Be? Prospects for NHS funding 2011-2017: The King’s Fund / Institute for Fiscal Studies

**Figure 7: Spending on the NHS 1950/01 – 2010/11 and forecast 2010/11 – 2014/15**



Source: House of Commons Library (2011) NHS funding and expenditure. Forecasts based on Spending Review (2010) and OBR forecast data.

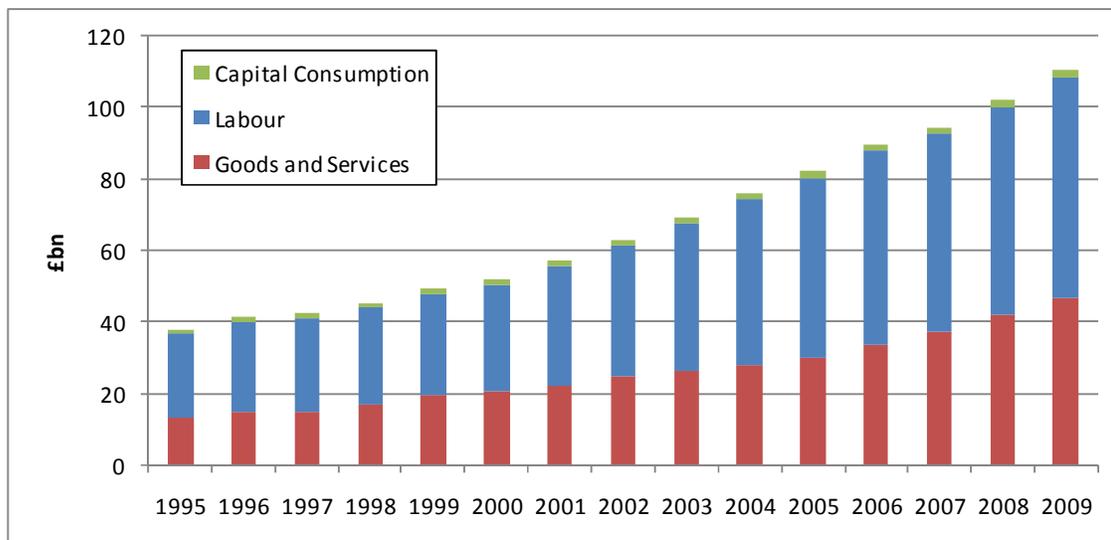
### A poor record on innovative procurement

Overall, the NHS appears to have performed poorly at deriving value from its procurement programmes. The recent House of Commons Health Committee report on Commissioning<sup>69</sup> was highly critical. It described commissioning as “a highly adversarial system” characterised by “tensions between purchasers and providers”. It criticised the Department of Health for the poor quality of its information on resources dedicated to commissioning and billing. Within commissioning bodies there appears to be a general lack of skills to analyse data, a lack of the clinical knowledge or the management skills needed to drive procurement. It also presented evidence of commissioners who were highly “passive” or even “disengaged” from specialist commissioning.

It is perhaps damning for NHS procurement that the expansion in spending on goods and services by the NHS has not translated into productivity improvements. As Figure 8 below illustrates, between 1995 and 2008 the greatest growth in public healthcare expenditure was on goods and services (this saw an average annual expansion of 9.3 per cent compared to labour (7.2 per cent) and capital consumption (3.3 per cent)). This procurement spending should therefore be seen as at the heart of the NHS’s productivity challenge.

<sup>69</sup> House of Commons Health Committee (2010) Commissioning: Fourth Report of Session 2009-10 Volume 1

**Figure 8: Expenditure on publically funded healthcare inputs 1995-2009**



Source: ONS (2011) Public Service Output, inputs and productivity: Healthcare  
<http://www.statistics.gov.uk/articles/nojournal/HP11-summary.pdf>

A clear message through the research was that NHS procurement appears to be slow to adapt and is very poor at sending out the 'innovative' buy signals which are needed to drive forward the supply chain. A number of nightmare examples of procurement blockages were highlighted.

The model of the innovation system set out in Figure 8 above illustrates the importance of demand within our understanding of what drives innovation. If the NHS fails to demand and purchase innovative new products and services then this will represent a major block on the healthcare innovation system. There will be less incentive for suppliers to invest in better understanding the needs of the NHS. Suppliers may be less willing to fund research into meeting these needs, or perhaps would be more wary of forming risky joint ventures to develop products and services which exploit new insights into care approaches. Ultimately the procurement signals sent out from the NHS will impact on its ability to deliver better or more cost effective goods and services.

This represents a major issue. If the NHS is to achieve its ambitious efficiency targets without compromising its service offer, then it will need to draw on new ideas, products and services from its supply chain. However, the analysis above suggests that the NHS poorly supports innovation here. Given its scale, this poor performance from the NHS will hold back innovation across the whole healthcare sector. The NHS must act as an anchor for its supply chain and actively consider how it creates an ecosystem within which innovation can flourish. Getting these conditions right would not only be positive for the NHS, but could represent a major boost to the private sector knowledge economy.

### Signs of promise

It would be misleading to write off all NHS procurement as static and un-innovative. Despite apparently systemic issues, our research has identified a number of highly positive initiatives. It appears that considerable effort has been made in recent years to enable the NHS to better connect to industry and for NHS procurement to better support innovation.

The creation of eight regionally based NHS Innovation Hubs represents an example of this work. The hubs were created in response to a perception that the NHS was failing to successfully commercialise innovations and intellectual property developed by NHS staff. NHS trusts are thought to lack adequate knowledge of how to patent or licence any advances that may be made by their staff. They also lack the industry connections needed to work with suppliers to develop licensing agreements. The Hubs were created to offer technical, commercial and legal support to aid this process. They can perhaps most easily be thought of as the NHS equivalent of university technology transfer offices. In this way their introduction can be viewed as a positive initiative to help the NHS better connect to private industry – they help to exploit knowledge developed within the NHS for commercial return, and of course, the NHS can benefit from the use of the products and services developed in co-operation with its own staff. Their introduction should therefore be seen as a positive investment in the NHS / Healthcare innovation ecosystem.

The parent body providing the central funding for these Hubs has also been pursuing this agenda in complementary ways. The NHS National Innovation Centre (which its self is part of the NHS National Institute for Innovation and Improvement) was established in response to the 2004 report of the Health Industries Task Force, *Better Health through Partnership*. It aims to be a focal point, supporting the activities of innovators of healthcare technologies and services across the healthcare sector – working with universities, the healthcare industry and the NHS, the NIC looks to speed up the development of innovations that will benefit the NHS and UK economy. It operates predominantly through an internet platform which links potential suppliers and users of healthcare goods and services – offering information on areas of clinical needs (demands for innovations), presenting metrics on suppliers (the Scorecard) supporting the operation of innovation tournaments and supporting the performance management of innovative contracts. Its help in articulating the needs of healthcare professionals appears to be of particular value to SMEs within the sector. In recent years the organisation has been recognised as an example of how the public sector can successfully support innovation in related areas.<sup>70</sup>

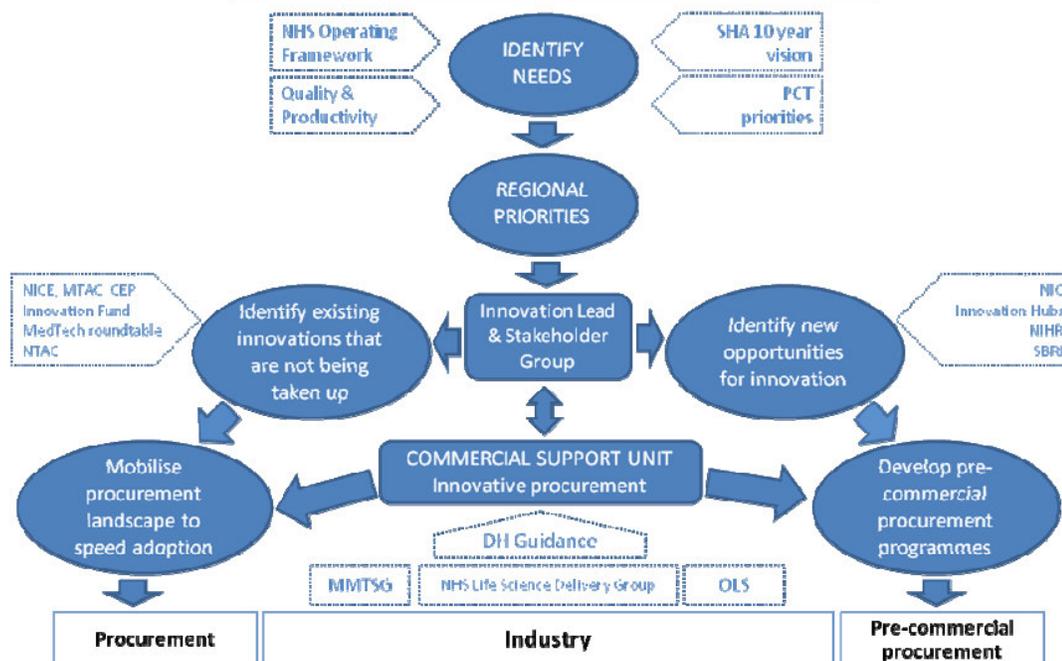
There are also clear signs that the Department of Health were looking to respond to these issues. In 2009 the Department produced a National Innovation Procurement Plan in response to a call for all departments to better consider their commercial strategies. This saw the introduction of Commercial Support Units (CSU) into the NHS. As illustrated in

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<sup>70</sup> See for example decryption of NIC in: Vinnova (2009) Can public procurement spur innovation in healthcare? Accessible at: <http://www.vinnova.se/upload/EPiStorePDF/CanPublicProcurementSpurInnovations.pdf> and OGC, Finding and Procuring Innovative Solutions, accessible at: [http://www.ogc.gov.uk/documents/Finding\\_and\\_Procuring\\_Innovative\\_Solutions\\_\(3\).pdf](http://www.ogc.gov.uk/documents/Finding_and_Procuring_Innovative_Solutions_(3).pdf)

Figure 9 below, the intention was that these bodies could help to better co-ordinate the interface between industry and the NHS.

**Figure 9: The regional approach to NHS technology-led innovation**



Note: This figure has been included here to reflect the complexity of the system and the direction of travel in December 2009. As detailed below it is not a plan of current arrangements

Source: Department of Health (2009) National Innovation Procurement Plan

It was hoped that these units could help to boost the adoption of new products and services across the NHS as well as supporting the development of pre-commercial procurement initiatives. It was intended that each CSU would work with innovation leads in Strategic Health Authorities to produce a Regional Innovation Procurement Strategy covering other NHS organisations with an innovation focus:

- The National Institute for Clinical Excellence (NICE) – provides guidance on promoting good health and preventing and treating ill health;
- The National Technology Adoption Centre – works with the NHS to identify and overcome barriers to adoption of innovative technologies;
- The National Institute for Innovation and Improvement – aims to support the development and dissemination of new ways of working, new technologies and promote leadership that can help to transform healthcare outcomes;

- The Department of Health's Research and Development Directorate – this coordinates a Small Business Research Initiative (SBRI) programme running competitions for new technologies;
- Innovation Hubs – as described above; and
- The National Institute for Health Research (NIHR) – focuses on supporting the health research system.

The Innovative Technology Adoption Procurement Programme (iTAPP) represents a further example of the Department of Health investment to make NHS procurement more receptive to innovative products and services. Under the programme organisations can submit 'solutions' for evaluation by the Department – all submissions will be assessed in terms of their potential net quality and net financial benefits to the NHS. It is a particular positive for SMEs who are considering supplying the NHS that the submission route to iTAPP is very straightforward. It was suggested through our research that the total net financial benefits from the 100 technologies being studied could reach £5bn if implemented fully. It is intended that this centralised evaluation process will ensure that products and services which receive a positive evaluation can readily access all NHS procurement systems.

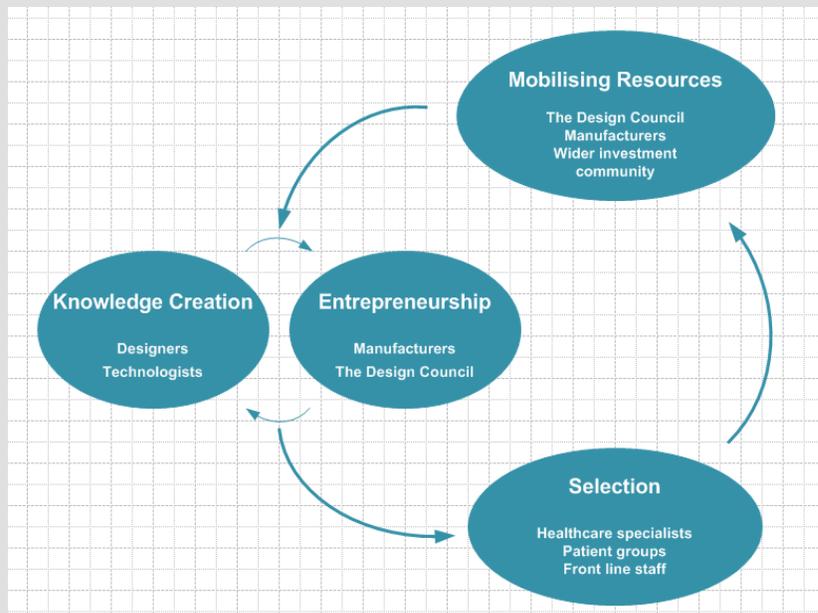
Finally, the Design Council led project, which was run in partnership with the NIC, described below reflects a very positive example of how to commission innovative goods and services. The programme used a design competition to connect a range of healthcare professionals, manufactures and designers to identify and respond to specific challenges faced within the NHS. This programme appears to have benefited from a focus on the outcomes from procurement. It also highlights the potential scale of returns that can be realised from relatively modest investments in the operation of the innovation system around the NHS.

### **Design Bugs Out**

The aim of the Design Council led project was to support innovation and design to reduce the transfer of hospital acquired infections. The Design Council worked with patients, nurses, domestics and other staff in a number of NHS hospitals to identify 51 'design opportunities' where developing furniture and equipment might be an advantage. The programme then used a small amount of seed funding (in the form of a national design competition) to encourage the development of new responses to these challenges.

The project was successful in promoting a dialogue between healthcare specialists, patient groups, front line staff, manufactures, designers and technologists which supported the development of new and improved products. Examples included a bedside cabinet which has fewer-hard-to clean corners and surfaces and an intelligent mattress which changes colour to highlighting if its waterproof plastic coating has been compromised. A number of the new products have received orders and are in production. One example was highlighted of a product developed through this scheme being exported.

Viewed from an innovation systems perspective, this programme represented the use of a relatively small additional investment to support the functioning of the innovation system. The investment appears to have helped to overcome a co-ordination failure and supported better interaction between the core building blocks of the innovation system. A stylised interpretation of the potential operation of this system is illustrated below:



This case also illustrates the important complementarities that exist between the public and private sectors with respect to innovation. It presents the innovation system as operating across this boundary, when supported by open and innovative procurement activities.

The programme has been described by individuals across the NHS as a positive future path for procurement. However, the fact that the scheme seems to have achieved very different outcomes from traditional procurement approaches highlights just how far this form of innovative procurement is from the bulk of commissioning activities within the NHS.

### **A system at risk of stasis**

The government is currently attempting to introduce a highly controversial reform of NHS structures. The bill is currently subject to review, but from the perspective of this research, the most important components reflect a shift in the responsibility for commissioning healthcare services from Primary Care Trusts to new consortiums which are likely to be based on groups of General Practitioners. This overall shift is unlikely to be subject to amendment.

As noted above, commissioning has a poor record, and PCTs appear to have performed weakly. A new commissioning structure could therefore potentially help to improve procurement and make it more innovative. The promise of better connecting patients, clinicians and those who procure services fits well with this agenda. But, from the perspective of the healthcare innovation system, the reforms also present major risks. A more fragmented commissioning system could make it more difficult to establish new procurement arrangements by increasing co-ordination challenges – for example it might be more difficult to develop consistent data on what works best and new competitive pressures could make it more difficult to share knowledge across the service and supply chain.

The debate on healthcare commissioning arrangements, however, represents a distraction from the central question of how to build a supportive innovation ecosystem around NHS activities. In principle, it would be possible to build this around either a PCT or a Consortium based model. But, successfully implementing either will take a strong political commitment. Unfortunately, it is far from clear that such commitment is at the heart of the NHS reform agenda.

It should be cause for concern that the wider efficiency drive within the NHS has seen the funding for the Innovation Hubs described above withdrawn. The role of the National Institute for Clinical Excellence is also to be scaled down to only providing advice and evidence on medical intervention options rather than the current system of guidelines which Trusts must stick to<sup>71</sup>. This is of concern since it is understood that these guidelines have been responsible for pushing the adoption of many innovations across NHS structures. Similarly, cuts in funding to the NHS Information Centre might undermine progress here by limiting important performance management data. While our research would not look to comment in general on these reforms<sup>72</sup>, these changes do imply that the NHS is not prioritising initiatives which will help to connect the service to the private sector.

Critically, the reform programme itself appears to be freezing the progress the NHS has made in recent years on connecting to the private sector – just at the time when this should be a top priority. Since the announcement of the planned reforms last year it has not been possible to predict the structures within which the future NHS (and its procurement systems) will operate. Many of those responsible for advancing and developing these innovative procurement arrangements are counted within the administration budget of the Department of Health where, as noted above, funding cuts of 33% are planned. In such a context it simply does not seem to be possible to establish innovative new systems and arrangements. For example, progress on the implementation of the CSU's appears to have fallen victim to this highly uncertain situation<sup>73</sup>. With no organisation performing their

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<sup>71</sup> Moberly (2010) NICE role change to cause problems for GPs, GP Newspaper, Accessible at: <http://www.gponline.com/News/article/1029656/NICE-role-change-cause-problems-GPs/>

<sup>72</sup> We understand for example, that the decision to cut funding for the Innovation Hubs was in part influenced by a desire to not unduly influence the market in private provision in this area.

<sup>73</sup> Our research identified that in the North East the CSU had been closed. In the West Midlands the organisation has been set up to focus on supporting best practice in commissioning healthcare services and does not have a procurement focus. It was suggested that this was a result of a lack of central direction through the establishment of these organisations.

core function, it remains unclear how the diverse range of innovation oriented bodies identified above plug into procurement processes and drive the healthcare innovation system.

Without constant attention, drive and vision there is significant risk that the progress identified in terms of how the NHS supports its wider innovation system will be lost. While a political settlement over the full reforms is yet to be reached, it does seem highly likely that the future NHS innovation ecosystem will look very different to that represented in Figure 9 – the role of the DoH may be significantly scaled back, many of the institutions mapped here have already lost funding, while more are still negotiating over their future<sup>74</sup>. Given this upheaval seen in the 18 months since the procurement strategy was launched, there is an urgent need for clarity and certainty about who will have the responsibility for building this public-private innovation system in the future.

To this end we should welcome the acknowledgement within the *Plan For Growth* (HM Treasury and BIS 2011) that “more can be done to develop the full potential of the NHS as an engine of innovation in health care and across the economy”. The fact that this agenda is being recognised here is encouraging. So too is the call for the NHS Chief Executive to work in partnership with industry, academia and other partners to produce a report on “how the adoption and diffusion of innovations can be accelerated across the NHS”. However, these issues ought to form the basis of NHS reforms. Instead they are being presented as an issue which must be considered once the broader reforms have been settled.

### Implications

There is currently a fierce ideological debate about how best to deliver the productivity improvements needed by the NHS. This appears to focus on the extent to which activities within the NHS become further marketised<sup>75</sup>. Yet, despite the increasing marketisation of the NHS in the past few decades<sup>76</sup> the organisation appears to still connect particularly poorly to the private sector – the organisation appears to struggle to build a wider innovation ecosystem with its private partners, despite the presence of many market based incentive structures.

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<sup>74</sup> While it remains too early to predict the future shape of arrangements, we can expect a dramatic rationalisation of these institutions. Our consultation suggested that a likely outcome would be a system built on just 4 key institutions – NICE (reformed as noted above), a regulator Monitor, the NHS Supply Chain organisation and the new NHS Commissioning Boards.

<sup>75</sup> This was the subject, for example, of the Liberal Democrat spring conference resolution that “Conference recognises however that all of the above policies and aspirations can be achieved without adopting the damaging and unjustified market-based approach that is proposed.” Source: [http://www.libdems.org.uk/latest\\_news\\_detail.aspx?title=Motion\\_carried\\_with\\_amendments:Updating\\_the\\_NHS:\\_Personal\\_and\\_Local&pPK=dabf4d29-021d-4366-8891-b38f40d44bc8](http://www.libdems.org.uk/latest_news_detail.aspx?title=Motion_carried_with_amendments:Updating_the_NHS:_Personal_and_Local&pPK=dabf4d29-021d-4366-8891-b38f40d44bc8)

<sup>76</sup> House of Commons Health Committee (2010) Commissioning Volume 1, contains a detailed coverage of the history of market reforms within the NHS. Accessible at: <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmhealth/268/268i.pdf>

## Reflections

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An innovation miracle is being demanded of the public sector from the centre. Services are facing a triple lock of shrinking public spending, expanding service demands and a broad reform agenda. But, in the cases studied here it appears that innovation is not being adequately supported:

- In the case of international education, there are significant limitations in terms of how well we are exploiting our existing strong public sector intangible asset base; and
- Within the NHS it appears that reform programmes are distracting attention from, and even retarding progress on how the NHS drives and supports innovation within its supply chain. The case illustrates the need to create or refocus bodies to build intermediary institutions capable of supporting a broad innovation ecosystem.

These case studies, and the evidence presented above reflect a weak understanding of how the public sector invests in intangible assets – this is a particular concern since these drive value in many highly knowledge intensive public sector activities. There appears to be limited awareness of how public spending actually supports innovation – either directly or through the promotion of broad innovation systems. There is a significant risk that without this knowledge, innovation will be cut along with spending.

It is a worry that the current reform agenda appears to focus on driving innovation in the public sector through market mechanisms alone. Public services could benefit from taking a broader view of how to build external networks which are capable of supporting innovation.

If we are to make the most of our public services then we need to be fully aware of on how to exploit public knowledge assets and how they can best investment in innovation. This will demand a focus on how public sector resources can build a supportive innovation ecosystem and a change in the ways in which innovation is considered within the public sector:

- **Public services need to develop a better understanding of how they invest in innovation.** Clearer practical guidance on how to understand and value investments in public sector intangible assets will be important if the public sector is to recognise, manage and effectively exploit its intangible asset base;
- **Public services must learn from private sector best practice** of how to support the development of ecosystems capable of driving innovation across many organisations. Central to this will be continued efforts to nurture the development of intermediary institutions as supportive knowledge nodes; and
- **Public services should focus on fostering new types of relationships with private sector partners.** A shift in the balance from adversarial engagement towards more collaborative arrangements would better support the co-development of innovative new products and services, and would aid the transfer of best practice.

Our public services must be viewed as part of the knowledge economy. Only with this understanding can the government ensure public funds are being invested in a way that drives innovation and boosts performance across the public and private economy. In the face of mounting challenges for public services, it is critical that we continue to priorities support for the public-private innovation ecosystems that lie at the heart of our knowledge economy.

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