

## UNITED KINGDOM

### Hot STI issues

- Encouraging closer relations between universities and business.
- Prioritising strategic investments in technology areas able to exploit their potential in global markets.
- Exploiting the potential to transform the public sector into a major driver of innovation.

**General features of the STI system:** With its large service-based economy, the United Kingdom performs below the OECD median on several headline indicators, including R&D expenditure and patenting. It is a very open economy, and a relatively high proportion of BERD is accounted for by large foreign-owned firms (Panel 2). BERD is below the OECD average at around 1.07% of GDP (Panel 1<sup>(d)</sup>). Almost half is accounted for by high-technology fields: pharmaceuticals (28%), aircraft and spacecraft (9%), and computer and software services (9%). Industry-financed public R&D expenditures as a share of GDP are below the OECD median (1<sup>(o)</sup>). However patents filed by universities and public labs per GDP is well above the OECD median (1<sup>(p)</sup>), an indication of the commercial efforts made by UK universities. The United Kingdom's RTA has remained quite stable over the last decade: it is strong in ICT and biotechnology and weaker in environment-related areas (Panel 3). With 35% of the adult population tertiary-qualified (1<sup>(s)</sup>), the proportion of the labour force employed in S&T occupations is only 28%, below the OECD median (1<sup>(v)</sup>). The 7.6 researchers per thousand employment is close to the OECD median. Researchers are reasonably well integrated in international networks: 45% of scientific articles and 25% of PCT patent applications were produced with international collaboration (1<sup>(q)(r)</sup>). ICT infrastructures are well developed. Fixed broadband subscriptions stand at 33% (1<sup>(k)</sup>); at 44%, subscriptions to wireless networks are around the

median (1<sup>(l)</sup>). The e-government readiness index is one of the OECD's highest (1<sup>(n)</sup>).

**Recent changes in STI expenditures:** The UK GERD (1.76% of GDP in 2010) is below the total OECD and EU27 levels. In 2009 industry funded 45% of total GERD, government funded 32% and 16% was funded from abroad. These figures confirm the relative lack of industrial R&D and the strong presence of international firms. In response to the economic crisis, the government included in its Spending Review 2010 a deficit reduction plan, under which the USD 7 billion science budget will be maintained at its current level until 2014.

**Overall STI strategy:** In December 2011, the government launched its Innovation and Research Strategy for Growth, with four core objectives: strengthen knowledge transfer; improve research infrastructure; foster business innovation, particularly in services and low- and medium-technology sectors; and make the public sector a major driver of innovation. In a broader context, the government launched its Plan for Growth in March 2011; it includes a number of innovation-related measures such as support of SME innovation and knowledge transfer from the public research system.

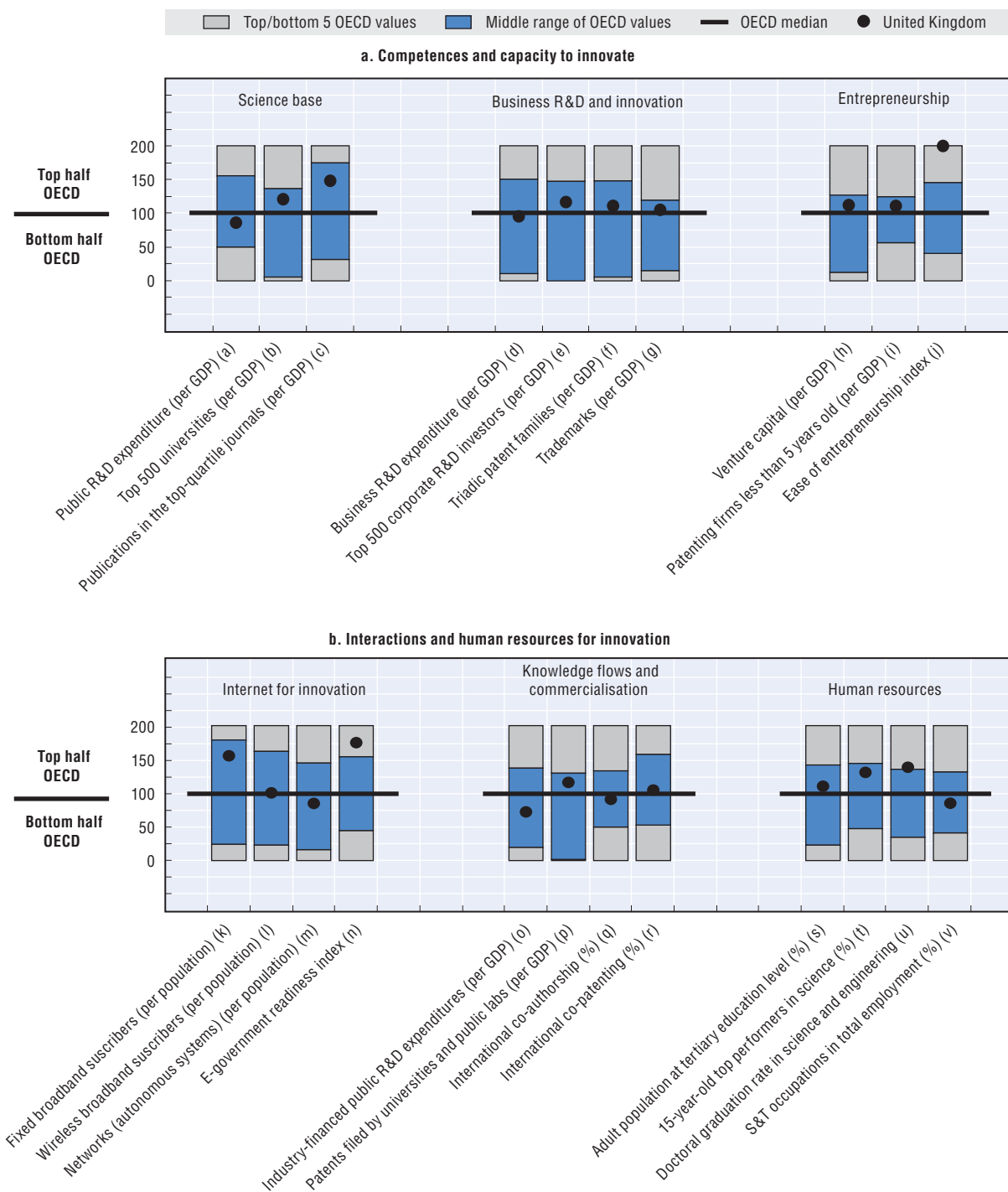
**STI policy governance:** The Department for Business, Innovation and Skills (BIS) is the main policy-making body in the STI area. In delivering its strategic priorities it is supported by a various partner organisations, including some non-

### Key figures

<b>Labour productivity, GDP per hour worked in USD, 2010</b> (annual growth rate, 2005-10)	<b>46.2</b> (+0.5)	<b>GERD, as % of GDP, 2010</b> (annual growth rate, 2005-10)	<b>1.76</b> (+0.9)
<b>Environmental productivity, GDP per unit of CO<sub>2</sub> emitted in USD, 2009</b> (annual growth rate, 2005-09)	<b>4.57</b> (+3.5)	<b>GERD publicly financed, as % of GDP, 2010</b> (annual growth rate, 2005-10)	<b>0.59</b> (+0.6)

Figure 10.42. **Science and innovation in the United Kingdom**

Panel 1. Comparative performance of national science and innovation systems, 2011



Note: Normalised index of performance relative to the median values in the OECD area (Index median = 100).

departmental public bodies, such as the Technology Strategy Board, the Higher Education Funding Council for England (HEFCE), and the Research Councils. At sub-national level, the English regional development agencies have been abolished and their innovation responsibilities transferred to the Technology Strategy Board. The devolved administrations in Scotland, Wales and Northern Ireland have their own science and innovation agendas and measures.

**Science base:** Although levels of public R&D expenditure are below the OECD median (1<sup>(a)</sup>), the United Kingdom is among the top performers in publication counts (1<sup>(c)</sup>) and boasts some of the world's leading research universities (1<sup>(b)</sup>). Although the public research system is university-oriented, most research is applied or experimental development (Panel 4). The government's renewed emphasis on concentrating resources on centres of proven excellence is supported by the Research Excellence Framework (REF), which will be completed in 2014 and replace the Research Assessment Exercise, the system previously used to assess the quality of university research. The new system puts much greater emphasis than its predecessor on measuring research impacts.

**Business R&D and innovation:** The government provides an increasing proportion of its support to business R&D and innovation through indirect funding (Panel 4). This is set to continue, with an increase in the rate of the SME R&D tax relief to 200% in 2011 and 225% in 2012.

**Public-sector innovation:** A key focus of the Innovation and Research Strategy for Growth is exploitation of the public sector's potential to drive innovation, particularly through the use of public procurement. Increased funding has been allocated to the Small Business Research Initiative (SBRI), a public procurement scheme that encourages SMEs to develop innovative solutions to challenges in the delivery of public services.

**Clusters and regional policies:** The regional development agencies have been replaced by consortia of local authorities and businesses in local enterprise partnerships (LEPs) which are expected to work with government to support enterprise, innovation, global trade and inward investment. LEPs cover some of the enterprise zones announced in the Plan for Growth, which offer superfast broadband, lower business tax rates, and low levels of regulation and planning controls, among other benefits.

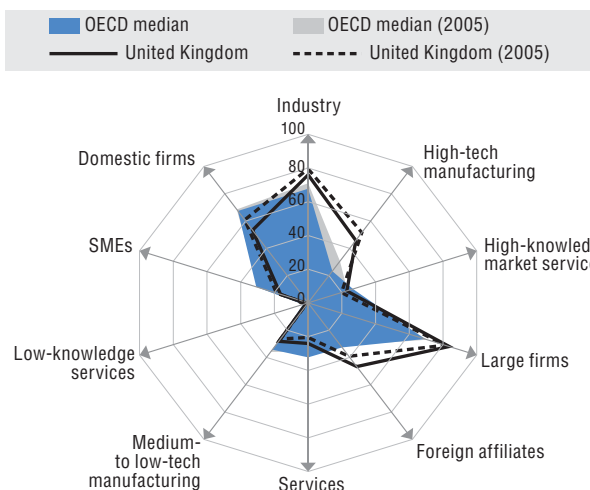
**Knowledge flows and commercialisation:** Improving the economic returns to investments in public research is an important policy goal, and a number of Catapult Centres have recently been announced to bridge the perceived gap between businesses and universities. These centres, which are overseen by the Technology Strategy Board with an investment of over USD 300 million, aim to create a critical mass of resources for business and research innovation. They will allow businesses to access equipment and expertise that would otherwise be out of reach. They focus on specific technologies with a potentially large global market and significant UK capability. The government has also announced the creation of an Open Data Institute to exploit the growth opportunities created by its open data policy.

**Human resources:** Over the period 2011-15, the Department for Education will spend up to USD 200 million to improve education in STEM in schools. Measures include the reform of the primary and secondary school curriculum, with a strong focus on essential knowledge, and incentives to attract the best students to teaching careers.

**Green innovation:** Efforts are being made to encourage investment in the green economy. The Technology Strategy Board has dedicated around 70% of its total investment to the development of low carbon technologies, and a Green Investment Bank has been set up to accelerate private-sector investment to move towards a green economy.

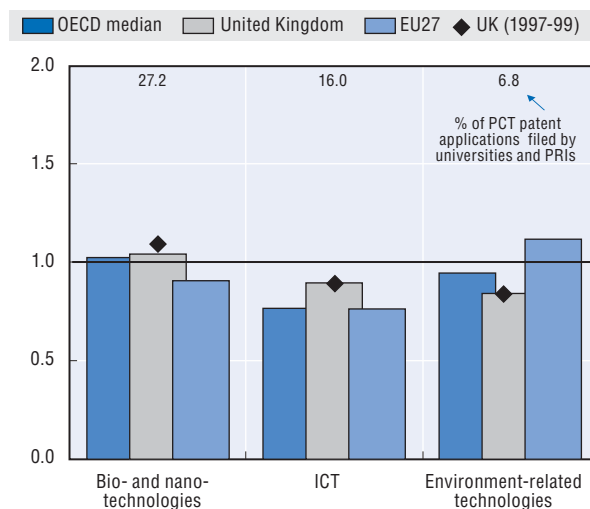
**Panel 2. Structural composition of BERD, 2009**

As a % of total BERD

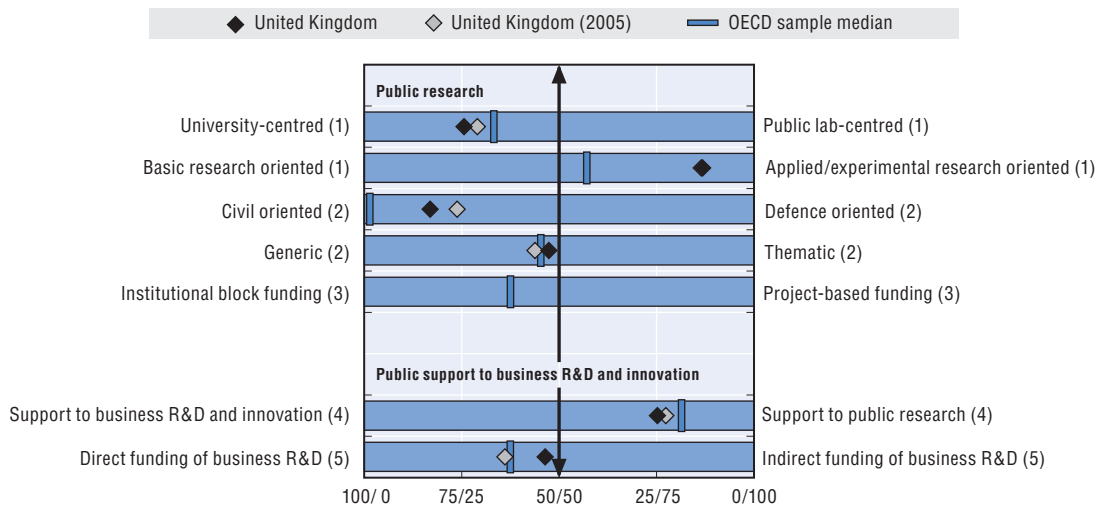


**Panel 3. Revealed technology advantage in selected fields, 2007-09**

Index based on PCT patent applications



**Panel 4. Overview of national innovation policy mix, 2010**



1. Balance as a percentage of the sum of HERD and GOVERD.
2. Balance as a percentage of total GBAORD.
3. Balance as a percentage of total funding to national performers.
4. Balance as a percentage of the sum of HERD and GOVERD funded by government and higher education and components of (5).
5. Balance as a percentage of the sum of indirect funding of business R&D and innovation through R&D tax incentives and direct funding of BERD through grants, contracts and loans.

Source: See reader's guide and methodological annex.

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