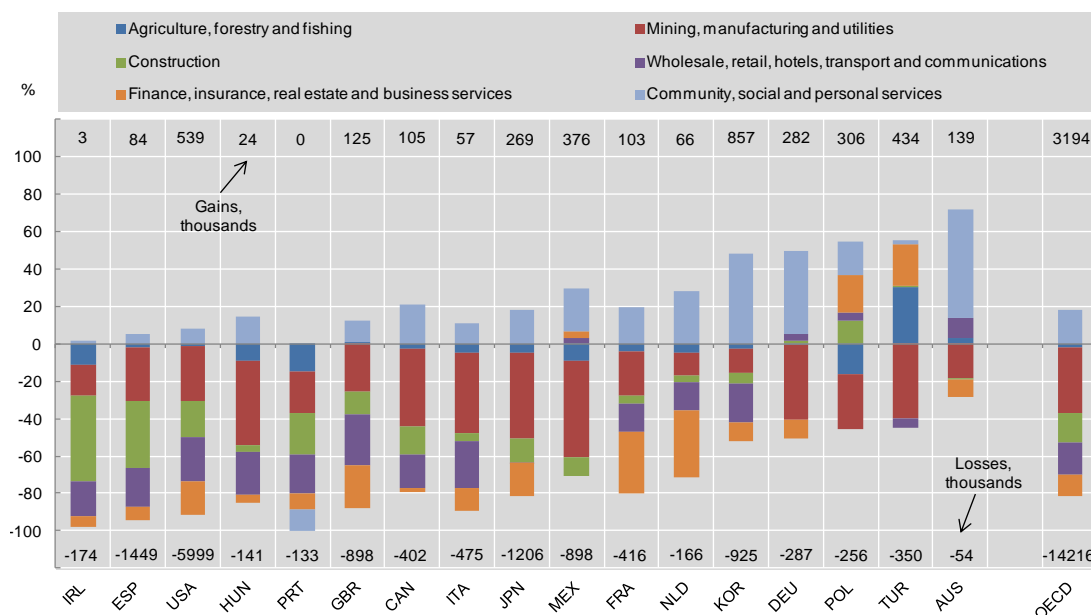


KEY FINDINGS: USA

Between 2008-2010, the OECD as a whole suffered over 13 million job losses – about half of which occurred in the United States. The US faces extraordinary challenges – with national debt levels rising and unemployment high. Innovation is critical for equipping countries to respond to the pace and scale of globalisation and find new and sustainable sources of growth and competitiveness. STI Scoreboard data shows that US government and business investment in knowledge, research and innovation provides strong fundamentals for the future. But with the rise of the BRICS countries, there are a number of innovation policy areas that should be closely reviewed – public and private financing, direct (or indirect) support for business, ensuring continued technological advantage and the competition in the global jobs market for highly skilled science graduates.

Where people lost their jobs, selected countries, 2008-09

Relative contribution to change in total employment by major sectors of economic activity



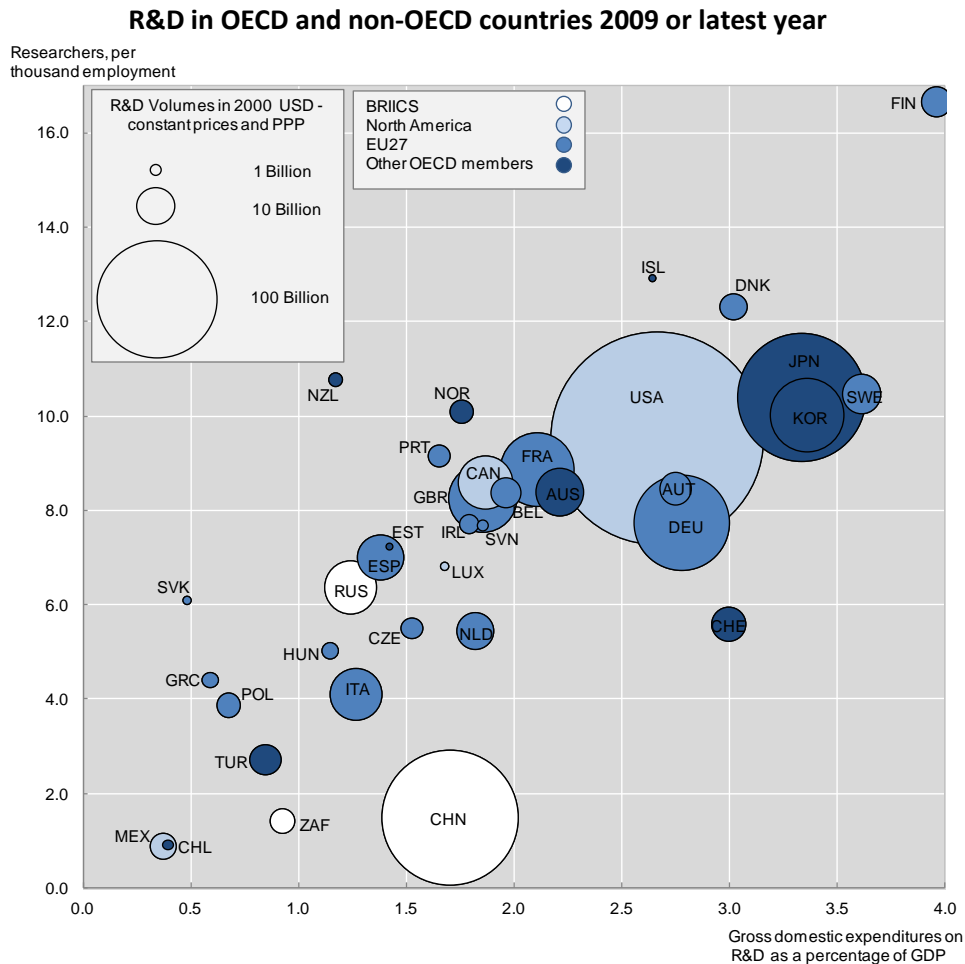
Source: OECD, Structural Analysis (STAN) Database, OECD National Accounts (SNA) Database and national statistical institutes, June 2011.

Statlink: <http://dx.doi.org/10.1787/888932484797>

Continued strong investment – public and private sector

The US has an unmatched national science and innovation system in terms of investment, size and reach. With nearly USD 400bn expenditure in 2009, the United States is the largest performer of research and development (R&D) in the world. Although China has recently become the second largest (USD 154 billion at purchasing power parity - PPP), the share of GDP that the United States devotes to R&D (2.7%) remains much higher than in China (1.7%). Personnel costs, which include researcher costs, in most economies account for the largest share R&D expenditures. This explains the close relationship between R&D as a percentage of GDP and number of researchers as a percentage of total employment.

Beyond government investment in R&D, the business sector in the United States also invests significantly (over 2% in 2008). The high ratio of researchers working in the business sector (over ten per 1000 employees) points to a density of innovation networks. This scale of investment gives the United States a very large critical mass. As scientific discovery increasingly involves the convergence of different fields, this weight of effort acts to attract top-talent from around the world as well as entrepreneurs who want to benefit from the scale that the US market.

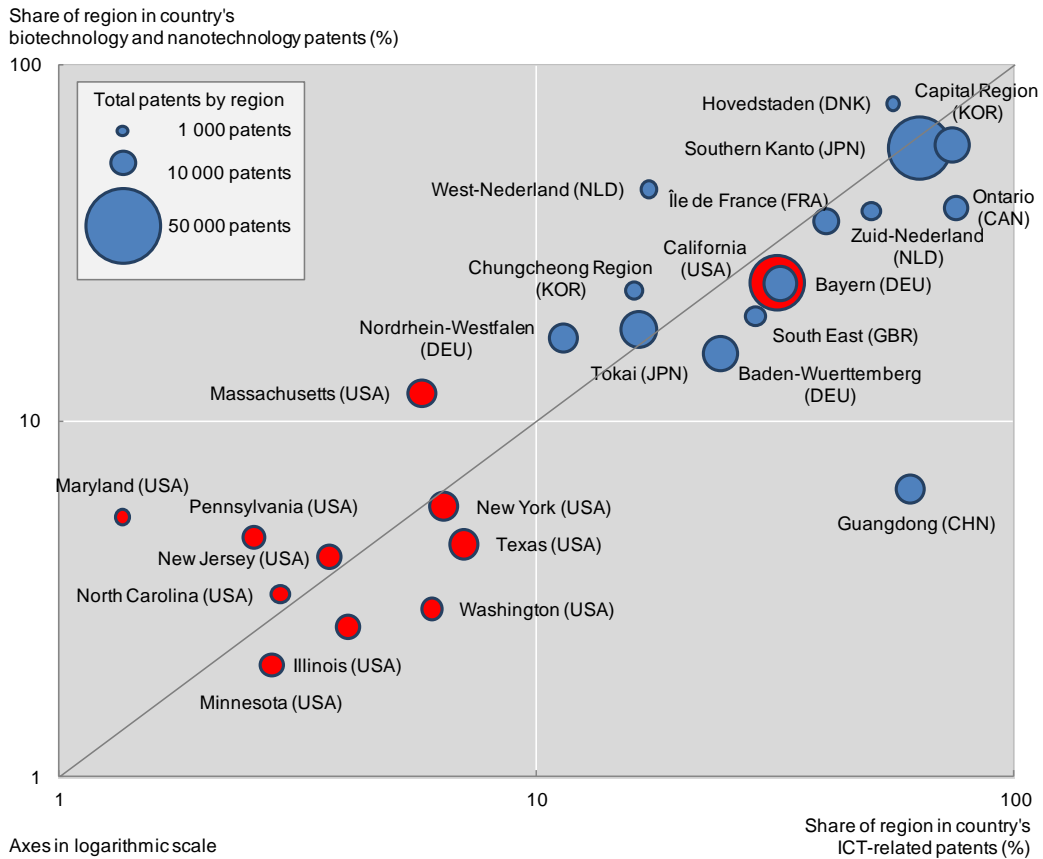


Source: OECD, Main Science and Technology Indicators Database, June 2011
 Statlink: <http://dx.doi.org/10.1787/888932485196>

A good regional spread of innovation activities

Many of the leading firms in knowledge-intensive industries – such as ICT and the life sciences – are also concentrated in a limited number of regions in the world. Charting the world’s top 20 patenting regions for ICT, biotechnologies and nanotechnologies, the United States is unique in having a larger number of smaller hot spots from coast-to-coast as opposed to the concentrated activity that characterises many countries. This reflects a more integrated and widespread national system of innovation.

Innovation hot spots in ICT, biotechnologies and nanotechnologies, 2006-2009
 Top patenting regions by technology field as a percentage of the country's patents in the field

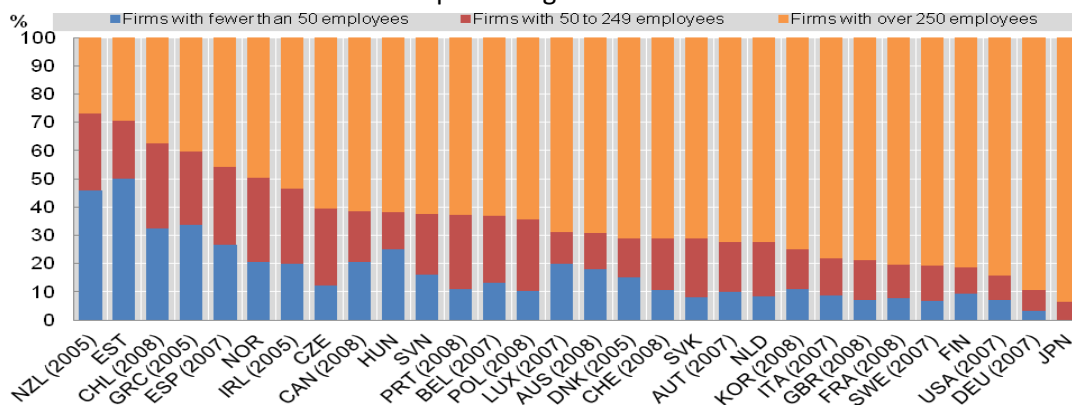


Source: OECD, REGPAT Database, June 2011.
 Statlink: <http://dx.doi.org/10.1787/888932485329>

The business R&D landscape in the United States is still dominated by large enterprises, though smaller entrepreneurial firms actively contribute to overall patenting activity.

Business R&D by size class of firms 2009

As a percentage of total BERD



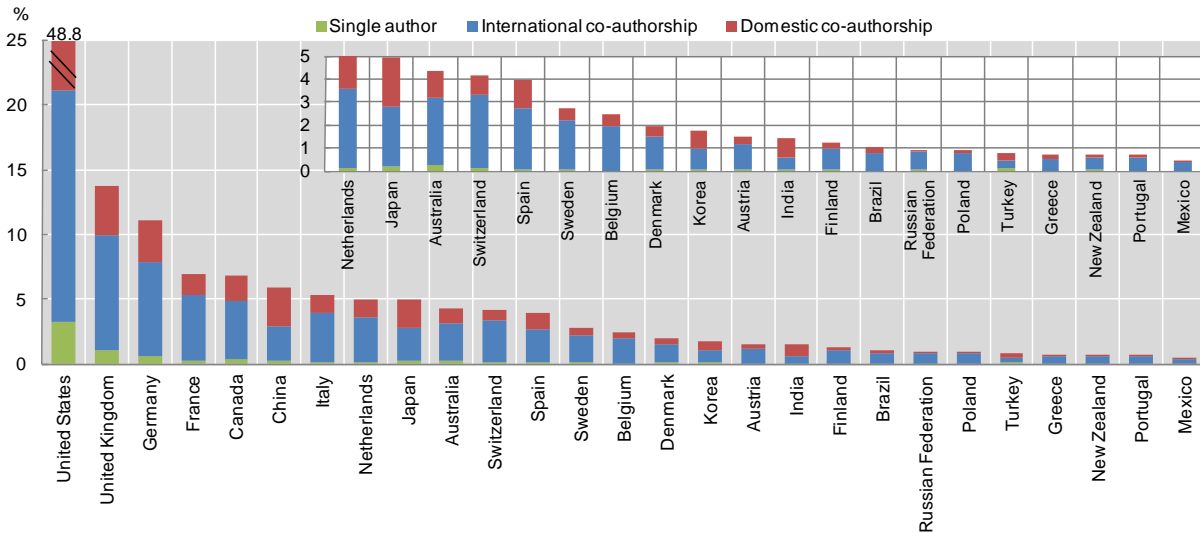
Source: OECD, Research and Development Database, May 2011.
 Statlink: <http://dx.doi.org/10.1787/888932486108>

World class science and research universities

Academic research in the US remains a reference worldwide, as shown by the number of normalised citations to United States academic publications. In absolute numbers the United States is the leading producer of publications in top journals, followed by the United Kingdom. If total publications are considered the United States still leads but China emerges in second position. Despite the rise of new players, the United States remains a key node for excellence in international research networks. The United States accounts for nearly half of the top 1% of most cited scientific papers. 20% of all internationally co-authored publications have an US author – for the closest followers, the UK and Germany, this figure is less than 9%.

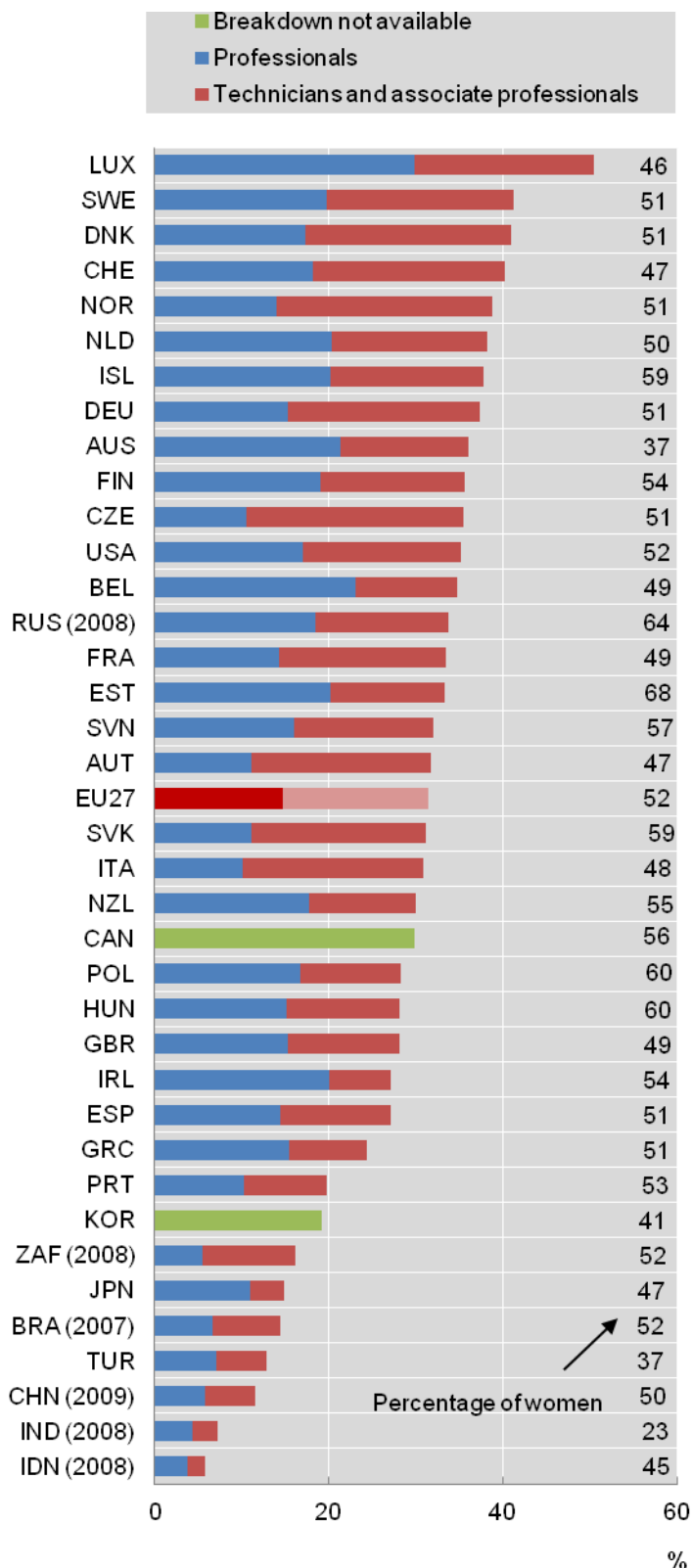
Highly cited (top1%) scientific articles by type of collaboration 2006-2008

As a percentage of highly cited scientific articles worldwide



Source: OECD calculations, based on Scopus Custom Data, Elsevier, December 2009
 Statlink: <http://dx.doi.org/10.1787/836087047406>

Much of this scientific expertise resides in US research universities. 40 of the world top 50 universities with the highest research impact are located in the United States, with the remainder located in Europe. In the United States, some universities excel in a wide range of disciplines. Stanford University features among the top 50 for all 16 subject areas, and 17 other US universities feature in the top 50 in at least 10 scientific fields.



HRST occupations 2010

As a percentage of total employment

The investment in learning and research translates into human resources in science and technology (HRST) who can play a key role in innovation. In the US, HRST account for more than 35% of total employment in 2010 (over 50% women).

HRST employees are more concentrated in services than manufacturing. HRST growth rates in the US between 2003-2008 were around 2% as compared to 1.20% employee growth in all sectors.

In the US, four out of five researchers work in business – over ten per 1,000 employees compared to the OECD average of 6.

Source: OECD, calculations based on EU Labour Force Survey; US Current Population Survey; Australian, Canada, Japanese and New Zealander labour force surveys; Korean Economically Active Population Survey; China Labour Statistical Yearbook 2010; Indian National Sample Survey; and ILO, Laborsta Database, May 2011.

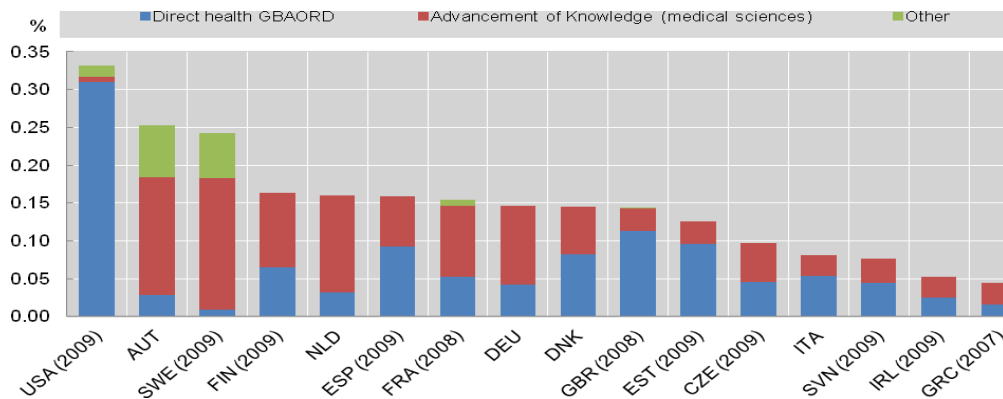
Statlink: <http://dx.doi.org/10.1787/888932485842>

Targeting new areas of growth

The United States has built a significant advantage in the key technologies for the future, although competition is mounting. It is the biggest investor in biotechnology R&D – spending 7% of total US Business Enterprise Research and Development (BERD) and has the highest number of active biotechnology firms – 6213. For the US and France, which spend the most on biotechnology R&D, approximately 88% of biotechnology R&D was performed by firms with over 50 employees.

The US is the largest funder of health-related R&D at just over 0.3% of GDP. In the late 2000s the US led in health patenting with more than 40% of health-related PCT patent applications (EU second with nearly 29% and Japan third at just under 10%).

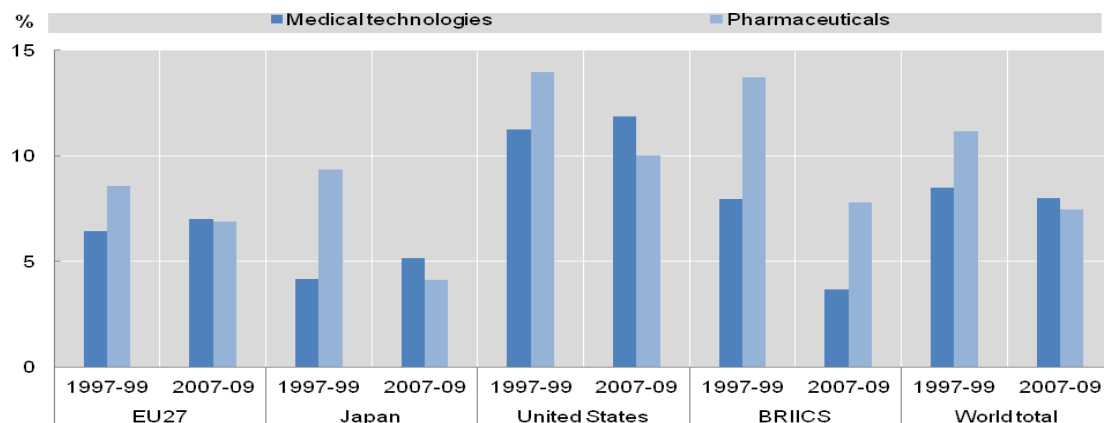
Public funding of health-related R&D, 2010
As a percentage of GDP



Source: OECD calculations based on the Research and Development Database and national sources, May 2011.

Statlink: <http://dx.doi.org/10.1787/888932486735>

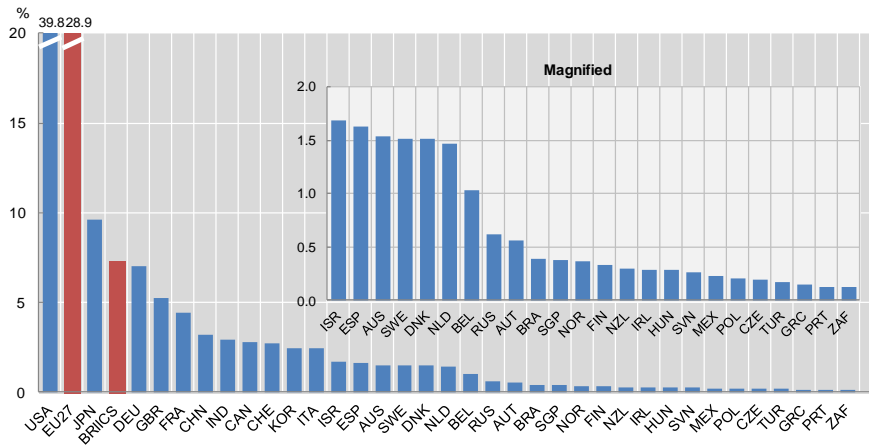
Health-related patents, 1997-99 and 2007-09
As a percentage of total PCT patent applications



Source: OECD, Patent Database, May 2011.

Statlink: <http://dx.doi.org/10.1787/888932486754>

Countries' share of pharmaceutical patents filed under the PCT 2007-09



Source: OECD, Patent Database, May/June 2011.

Statlink: <http://dx.doi.org/10.1787/888932486773>

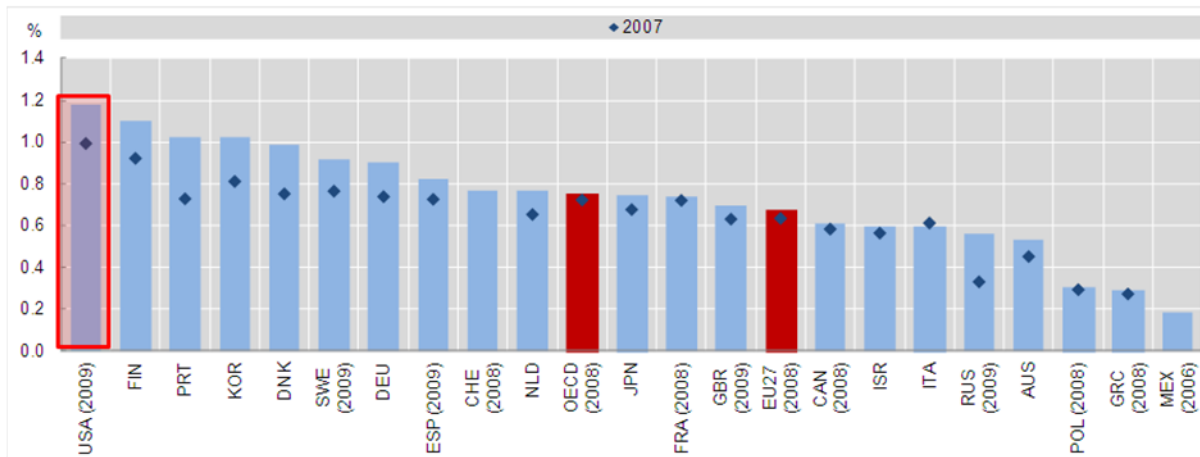
Key issues:

Financing

Given the economic context, high unemployment and the pressures on government spending, a key question is how long can the US maintain its high level of public financing of R&D?

Government budget appropriations for R&D, 2010

As a percentage of GDP



Source: OECD MSTI Indicators Database June 2011

Statlink : <http://dx.doi.org/10.1787/888932486659>

Beyond public funding, private financing (via bank loans, debt or equity financing and venture capital) is critical to stimulating new business and expanding existing ones. An OECD indicator using data from the World Economic Forum shows that bank financing became more difficult to obtain between 2007-2010. In the US, ease of access to bank loans declined significantly from 2007-2008 to 2009-2010.

Venture capital funding in 2009, as a percentage of GDP, was highest in Israel, followed by the United States. However venture capital is increasingly sensitive to market cycles in terms of amounts invested

and stages of investment. Under conditions such as today's difficult financial environment, venture capital funds are investing in later stages, leaving gaps at the pre-seed and seed stages where profit expectations are less clear and risks much higher. Angel investment is the most significant source of outside equity for seed and early stage start-ups – filling the financing gap left by venture capitalists. A forthcoming OECD report High Growth Financing examines this in more detail.

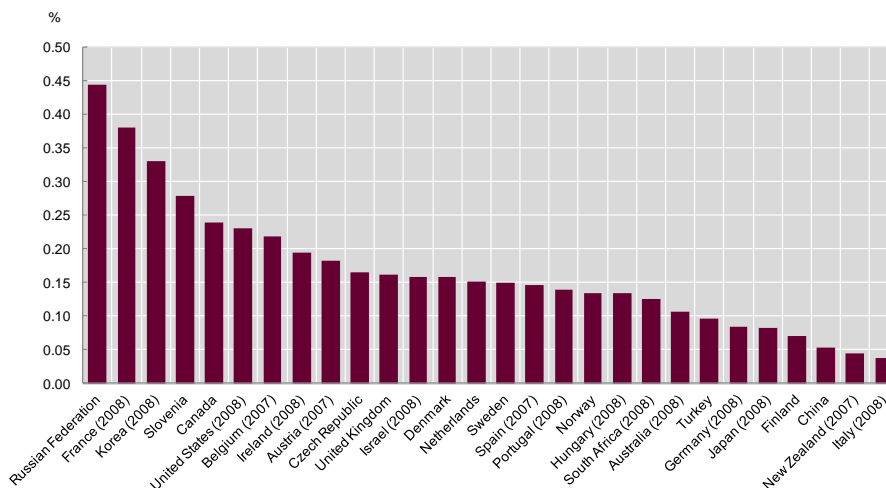
HRST mobility

Over a quarter of all new doctorates in science and engineering in the OECD are from the United States: 26.3% of the nearly 89,000 OECD total in 2009, slightly down from 28.6% in 2007. Higher education and research systems have become more internationalised over the past decades. In 16 out of 28 countries – and in the US in particular - the share of international and foreign students enrolled in science and engineering surpasses that of national students and the pattern is more pronounced at the doctoral level. It highlights a number of challenges for the US - firstly the need to raise domestic interest in key science and technology fields, especially as standards and reputation of universities elsewhere in the world improve. Secondly to ensure that highly skilled science graduates or doctorate holders contribute to research and innovation within the US economy. In the past the US has benefited from science and engineering graduates coming from a range of countries, including emerging economies. As employment and economic opportunities improve in these countries, the US will find itself competing in a much wider global market for these highly skilled science researchers.

Direct and indirect support for business

Tax incentives can be a cost-effective way to boost innovation in the business sector. Many countries, like the United States, Russia, France, fund large mission-orientated R&D in areas such as defense, health and the environment. However, some countries, for example Israel, are increasingly using a mix of direct government funding for R&D and indirect support through tax credits and subsidies. Taking both policy approaches into account the total investment of the United States falls below that of other countries like France, Korea and Canada.

Total government funding - of business R&D and tax incentives for R&D, 2009



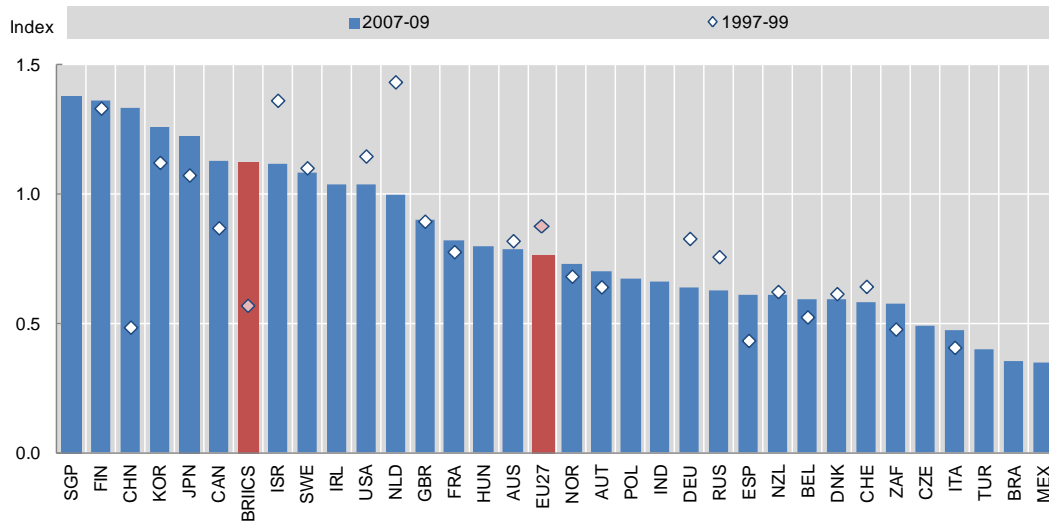
Source: OECD, based on OECD R&D tax incentives questionnaires January 2010 and June 2011 and OECD MSTI Database June 2011

Technology edge

A new indicator on technological advantage in patent applications shows that the United States has begun to lose its technology advantage in ICT, an area previously dominated by the US. In 2007-2009 the share of ICT-related patents applied for by Asian countries (China, Korea, Japan and Singapore) rose – China had the largest increase in ICT-related PCT filings in the 2000s.

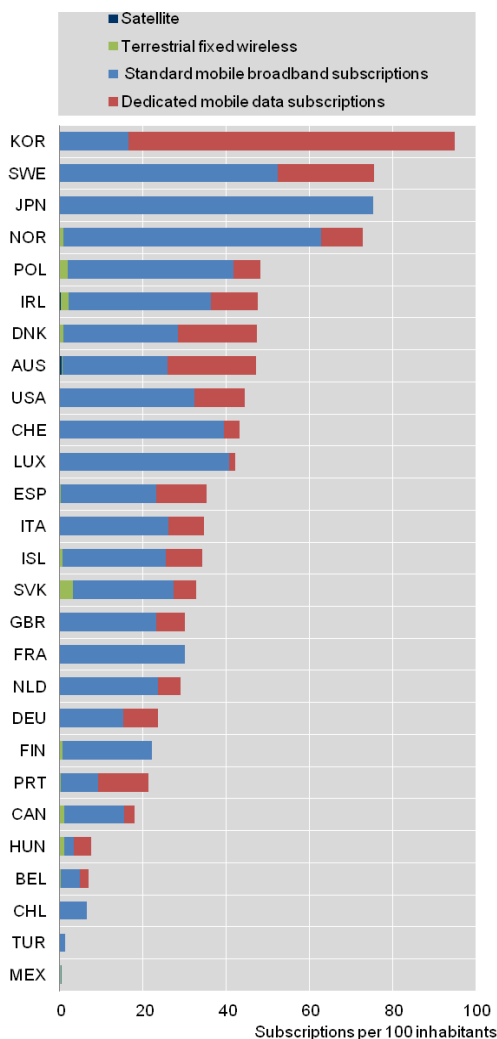
Revealed technological advantage in ICT, 1997-99 and 2007-09

Index based on patent applications filed under the PCT



Source: OECD, Patent Database, May 2011.

Statlink: <http://dx.doi.org/10.1787/888932487970>



OECD terrestrial mobile wireless broadband subscriptions per 100 inhabitants, by technology, June 2010

Wireless broadband is widely recognised as an important platform for innovation given the growing popularity of smartphones and tablet computers in business (and social) activity and an ever increasing market for new content and services from application stores

Wireless broadband subscriptions in OECD countries had exceeded half a billion by the end of 2010, an increase of more than 10 percent on June 2010. The United States falls behind first tier countries like Korea and Japan in wireless broadband connectivity.

Source: OECD, OECD Broadband Portal June 2011
Statlink: <http://dx.doi.org/10.1787/888932486925>

Global environmental challenges

In absolute terms the United States is the second largest funder of R&D into energy and the environment with USD 3.7 billion just behind Japan with USD 4.2 billion. However this represents less than 2% of its overall budget. Finding cleaner, affordable and reliable energy sources and promoting sustainable growth is global area that should not neglected.

Some governments have adopted concerted policy measures in alternative energy areas. For example innovation in alternative fuel vehicle technologies has accelerated thanks to a mix of policy instruments – eg fuel efficiency standards, after-tax fuel prices. The US has increased focus on AFV innovation, contributing 689 AFV patents, but lags behind Germany (965) and Japan (3195). China is also increasing innovation activity in AFV technologies, though its level of patents in absolute terms is still small.

OECD Science, Technology and Industry (STI) Scoreboard - major world trends in knowledge and innovation. It analyses a wide set of indicators of science, technology, globalisation and industrial performance in OECD and major non-OECD countries (notably Brazil, the Russian Federation, India, Indonesia, China and South Africa) and includes some experimental indicators that provide insight into new areas of policy interest.

Contents

Chapter 1. Knowledge Economies: Trends and Features

Chapter 2. Building Knowledge

Chapter 3. Connecting to Knowledge

Chapter 4. Targeting New Growth Areas

Chapter 5. Unleashing Innovation in Firms

Chapter 6. Competing in the Global Economy

www.oecd.org/sti/scoreboard.