

OECD SCIENCE, TECHNOLOGY AND INDUSTRY SCOREBOARD 2007

BRIEFING NOTE ON THE UNITED STATES

Innovation and performance in the global economy

Throughout the world, innovation and globalisation are the two major sources of countries' economic performance. They directly affect productivity, job creation and citizens' well-being, and they help make it possible to address global challenges such as health and the environment. As their role has taken on greater prominence, their characteristics have evolved and policies have had to adapt.

The eighth edition of the *OECD Science, Technology and Industry Scoreboard* explores recent developments in matters relating to science, technology, globalisation and industrial performance. It points to an increasing globalisation of science and technology activities encompassed by more stable trends in investment in knowledge. The pace of diffusion of information and communication technologies has become steadier than in the heady days of the late 1990s, notably in terms of broadband Internet access among households and adoption by businesses for e-commerce. Public policies that seek to foster innovation are being progressively reoriented, from subsidies and procurement to alternative instruments such as R&D tax relief and reinforcement of industry-science linkages.

The United States continues to be at the forefront of innovation...

The **United States** has the highest share of investment in knowledge (as % of GDP), reaching 6.6% in 2004 compared to an average of 4.9% for the OECD as a whole, mainly due to significant expenditure on R&D.

Total R&D expenditure (GERD) in the United States continues to grow steadily in real terms, reaching USD 344 billion in 2006, or 42% of the OECD area total. R&D intensity (R&D expenditure / GDP) remains stable at 2.6% from a peak of 2.7% in 2001. This relative stability hides some changes in terms of funding and performance: for example, between 2004 and 2006, the decline in government-financed GERD (as a % of GDP) was compensated by an increase in the share funded by the business enterprise sector.

With regard to R&D performance, business enterprise remains the main sector in the United States (70% of the total in 2006), although the share of higher education institutions has been steadily increasing (14.3% in 2006 compared to 12.1% in 2001). Since 2003, business enterprise R&D (BERD) has enjoyed positive growth (in real terms), reaching a new peak of USD 208 billion in 2006. In terms of cross-funding of research, in the US, government funding of business R&D is significant (around 10%) although declining, while business funding of R&D in the government and higher education sectors remains very low compared to other OECD countries (less than 3%).

The US has the second highest government R&D budget (GBAORD) as a share of GDP among OECD economies (around 1%), but growth has mainly been driven by defence R&D, which has grown steadily from 56.9% of GBAORD in 2005 to 57.9% in 2006 and 58.3% in 2007.

The United States accounts for the largest share of total venture capital in the OECD area (39%), and ranks among the highest in terms of venture capital investment as a % of GDP (almost 0.2% in 2005). In the US, most of this investment is concentrated in high-tech sectors (almost 90% of total venture capital).

... and the US remains an attractive destination for foreign S&T students.

The United States continues to attract the largest number of foreign doctoral students: about 10 000 obtained a doctorate in science and engineering (S&E) in 2005, or 38% of all S&E doctorates awarded.

In 2005, the number of S&E doctorates awarded by US universities peaked at 28 000, surpassing the previous high of 1998. This is the result of a three-year increase in S&E doctorate awards (2002-2005), following a four-year decrease (1998-2002). This suggests that there has in fact been no decline in the number of S&E doctorates granted to non-US citizens who account for most of the recent growth. Asian students accounted for more than two-thirds of non-US doctorates in 2005 (Chinese students accounted for 30% and Koreans for 10%). Doctorate recipients, particularly from China and India, often remain in the US on a post-doctoral position or take a job.

The population of foreign scholars working in the United States has continued to increase despite a decline during the two post-September 11 academic years, with security-related changes in visa policy. The number of foreign scholars working in the US reached 97 000 in 2005-06 (compared to 60 000 in 1993-94).

Despite being an attractive location for foreign students, the United States faces strong competition for talent from other regions: 31% of all OECD university graduates were in the United States but accounted for only 22% of all OECD S&E degrees, compared to 39% and 43% respectively for the EU. S&E degrees in the United States accounted for less than 15% of all new degrees in 2004, compared to 23% in the EU, 25% in Japan and close to 40% in Korea and China.

Policies to foster innovation have been effective ...

R&D tax credits continue to be an important policy tool: it is estimated that in 2005, government revenue forgone in the United States as a result of R&D tax credits was over USD 5 billion.

The US remains a key player in world science as measured by publications accounting for 30% of the world total (33% for Europe and 8% for Japan). US scientific articles are also heavily cited (2nd after Switzerland in terms of relative prominence).

The US continues to lead in high-tech industries such as ICT and pharmaceuticals supported by successful clusters: among OECD regions, California has the highest number of PCT (Patent Cooperation Treaty) applications for both industries. Other US regions which play a key role include Massachusetts (biotech and ICT), Maryland (biotech), and New York (ICT). In emerging fields such as bioscience, nanoscience, or environmental science, the US maintains strong leadership in terms of scientific articles.

... and ICT remains a driving force for the US economy

Despite a slowdown following the year 2000, ICT investment in the United States is the highest among OECD countries, reaching almost 30% of all investment (GFCF, gross fixed capital formation)

in 2005. Software was the largest component of this investment, followed by communication equipment.

In terms of diffusion, the US is ahead in some technologies, but lagging in others. Communication access in terms of cellular mobile subscribers was relatively low for OECD standards reaching only 72 subscribers per 100 inhabitants in 2005, compared to 80 for the OECD as a whole and more than 100 for the majority of EU countries. In terms of Internet diffusion, broadband uptake in the US has been average with only 20 subscribers per 100 inhabitants in 2006, a lower rate than other large OECD countries including Japan, France, the UK, Canada and Korea.

ICT is transforming the way in which the US economy works: e-commerce continues to grow steadily, from around 1% of total retail sales in 2000, to 2% in 2004, and 3% by the end of 2006. ICT is also a key product in terms of US trade, accounting for around 16% of total trade in 2005, although the role of OECD countries in world ICT exports has been steadily declining since the early 2000s. The US accounted for 16% of the world total in 2000, but for only 10% in 2005, mainly due to the rise of China, the world's top ICT exporter since 2004.

... which maintains high levels of productivity

In terms of productivity levels (GDP per capita), the US is second only to Norway among OECD countries, mainly due to very high rates of labour utilisation. The US has enjoyed strong labour productivity growth of around 2.5% annually between 2000 and 2005, the highest of the G7 countries. GDP growth has mainly been driven by multifactor productivity (MFP) over the last few years (2000-05). Key to this growth are business sector services which account for more than half of the total value added (around 54%), as well as knowledge-intensive "market" services which account for about one-quarter.