Executive Summary

Innovation is a major source of economic performance and social welfare. It directly affects productivity, job creation and citizens' well-being and helps to address global challenges such as the economic crisis, health and the environment. As the role of innovation has taken on greater prominence and its characteristics have evolved, statistical information is necessary to measure these global challenges and to identify directions for responding to them.

The ninth edition of the *OECD Science, Technology and Industry Scoreboard* explores recent developments in matters relating to innovation, science, technology and globalisation. In this regard, it compares characteristics of OECD member and major non-member economies and provides information on the economic crisis and other global challenges. Major findings include:

- Historical data show that research and development (R&D) and venture capital are among the first expenditures to be cut during recessions in OECD countries. Preliminary data confirm this finding for the first half of 2009.
- Foreign direct investment (FDI) inflows to G7 countries decreased by 25% in 2008. In the first quarter of 2009, FDI flows to Canada, Germany, Italy, Japan and the United States dropped by a further 63%. On the contrary, FDI inflows to the United Kingdom more than doubled in the first quarter of 2009, back to the same level as the previous year. As foreign affiliates provide access to new technologies and generate knowledge spillovers for domestic firms, lower inflows of FDI will reduce innovation capabilities in the host country.
- Patents in renewable energy and air pollution control are the most dynamic groups of environmental technologies. Over 1996-2006, they increased more rapidly than total patents filed under the Patent Co-operation Treaty (PCT).
- The United States accounted for over 42% of pharmaceutical patents in the mid-2000s; China and India together for nearly 5%. A decline in productivity of the pharmaceutical sector has been evident since the mid-1990s.
- A decrease in biotechnology patents has been observed in some countries in recent years in relation to the more stringent criteria on the patenting of genetic inventions.
- Inventive activities in nanotechnology have risen substantially since the end of the 1990s but the share of nanotechnology in total patenting remains just above 1% on average. Singapore is the country most specialised in nanotechnology.
- Business is an important source of funding for R&D performed in the higher education and government sectors, with an OECD-area average of 5.3% in 2006.
- High-technology goods have been among the most dynamic components of international trade over the last decade. In 2007 high- and medium-high-technology manufactures accounted for 23% and 39%, respectively, of total manufacturing trade.
- Information and communication technology (ICT) goods and services have been among the most dynamic components of international trade over the last decade. But the share of OECD

countries in total world ICT trade decreased from 75% in 1997 to 52% in 2007 with the rapid rise in trade from non-OECD Asian economies.

- Patent data show a significant degree of internationalisation of research activities. On average, over 15% of the patents filed by an OECD country in 2004-06 under the Patent Co-operation Treaty concerned inventions made abroad.
- International co-authorship has also been growing fast. In 2007, 21.9% of scientific articles involved international co-authorship, a figure three times higher than in 1985.
- The number of foreign students within the OECD area has tripled since 1980, and doubled between 2000 and 2006. The United States hosted the largest foreign doctoral population, with more than 92 000 students from abroad, followed by the United Kingdom (38 000) and France (28 000).
- Emerging countries are expanding their first-stage university system. Graduation rates in Russia (45%) are significantly above the EU average. In China the number of graduates has almost tripled since 2000, although the graduation rate (12%) is still low compared to the OECD average.
- Between 1998 and 2007, employment of tertiary-level graduates rose on average almost three times faster than total employment. Overall, 35% of persons employed in the OECD area had a tertiary-level degree in 2007.