

Highlights from the OECD Science, Technology and Industry Scoreboard 2017 - The Digital Transformation: Germany

Science, innovation and the digital revolution

- **Germany** accounted for 5.8% of the world's top 10% of most-cited scientific publications, behind the United States, China and the United Kingdom [[Scoreboard fig. 1.11](#)].
- **Germany** accounted for over 3.7% of AI-related patent applications during 2010-15, down from 6.3% in 2000-05 [[fig. 1.7](#)].
- The development of AI technologies is fairly concentrated. R&D corporations based in Japan, Korea, Chinese Taipei and China account for about 70% of all AI-related inventions belonging to the world's 2 000 top corporate R&D investors and their affiliates, and US-based companies for 18%. Firms headquartered in **Germany** accounted for 3.2% of all AI-related inventions from 2012 to 2014 [[fig. 1.25 - see below](#)].

Growth, jobs and the digital transformation

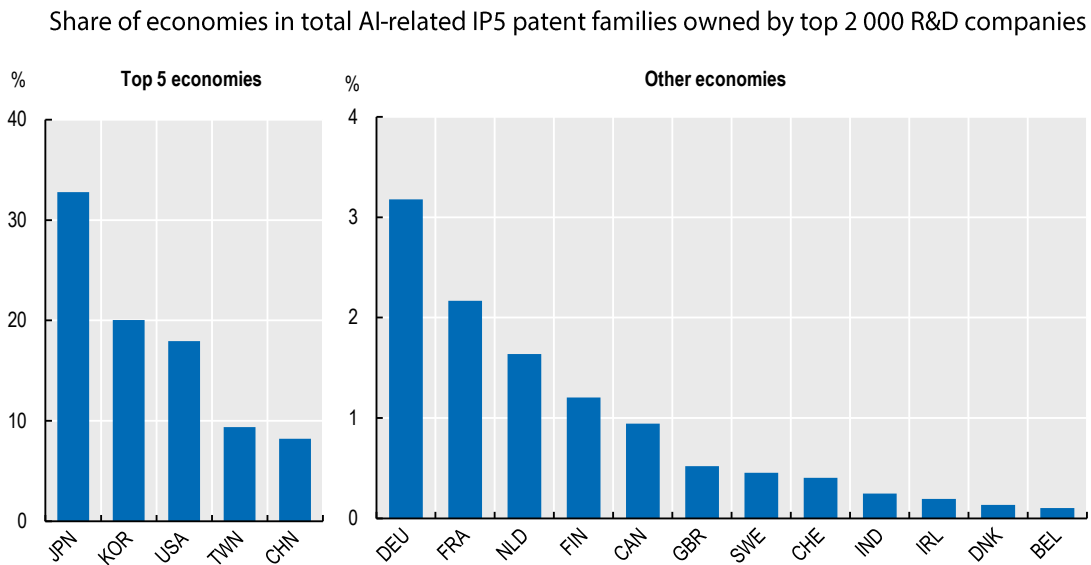
- Data for 2015 on the deployment of industrial robot technologies show that **Germany** leads in Europe (but is behind Korea and Japan in the OECD) in terms of robot intensity i.e. the industrial stock of robots divided by manufacturing value added). Robot intensity in **Germany** is less than half that of Korea, however [[fig. 1.28 - see below](#)].
- From 2010 to 2016, **Germany** had the third-largest net employment gains in the OECD, of over 2.5 million jobs, behind the United States and Turkey [[fig. 1.34](#)].
- In 2014, almost 42% of jobs in **Germany's** business sector were sustained by foreign demand, up from 35% in 2004 [[fig. 1.38](#)].
- Women in **Germany** earn, on average, about 10% less than men, even after individual and job-related characteristics are taken into consideration, among the smallest gender wage gaps in OECD [[fig. 1.41](#)].
- In **Germany** women represented about 27% of all tertiary graduates in natural sciences, engineering and ICT fields in 2015. This share was mainly driven by graduates in science and engineering (24.7%) rather than ICT (2.2%). [[fig. 1.59](#)].
- **Germany** was the fourth-most important hub for IT manufacturing in 2011, after China, the United States and Korea, down from 3rd place in 1995. **Germany** was the 2nd most important hub for ICT services in 2011, as it was in 1995 [[fig. 1.56](#)].
- Almost 90% of persons aged 16-74 in **Germany** used the Internet in 2016, up from 69% in 2006 [[fig. 1.57](#)]. 99% of 16-24 year olds used the Internet in 2016, compared to 74% of 55-74 year olds [[fig. 1.58](#)].

Innovation today - Taking action

- **Germany** was among the OECD countries where government budgets for R&D have increased since 2008, rising 24% from 2008 to 2016 [[fig. 1.62 - see below](#)].

- 12.2% of domestic scientific documents in **Germany** were in the world's top-10% most cited, ahead of the European Union (11.9%), but behind the United States (13.9%) and the United Kingdom (13.6%) [fig. 1.12].
- During the period 2012-15, 5.2% of IP5 patents with inventors from **Germany**, involved women inventors from Germany, lower than comparable shares for the United States (10%) and the EU (7%) [fig. 1.61].
- Experimental indicators of international mobility of scientific authors (based on bibliometric data) reveal that during the period 2002 to 2016, **Germany** experienced a net outflow of scientific authors, with over 5 000 more authors leaving affiliation in Germany than joining [fig. 1.69 - see below].

Figure 1.25 Artificial intelligence patents by top R&D companies, by headquarters' location, 2012-14

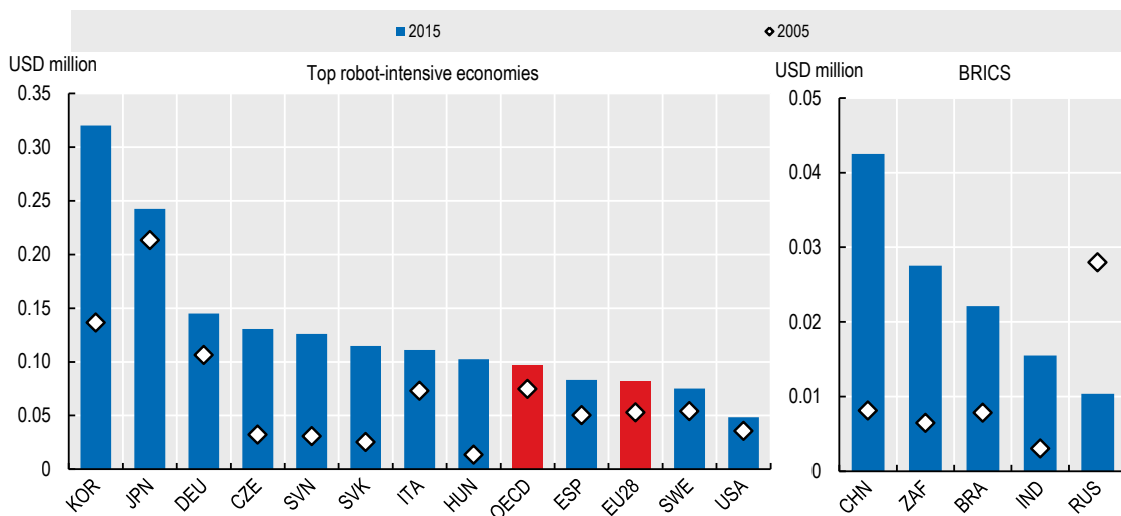


StatLink <http://dx.doi.org/10.1787/888933617320>

Source: OECD Science, Technology and Industry Scoreboard 2017: The Digital Transformation, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_scoreboard-2017-en.

Figure 1.28 Top robot-intensive economies and BRICS, 2005 and 2015

Industrial robot stock over manufacturing value added, millions USD, current values

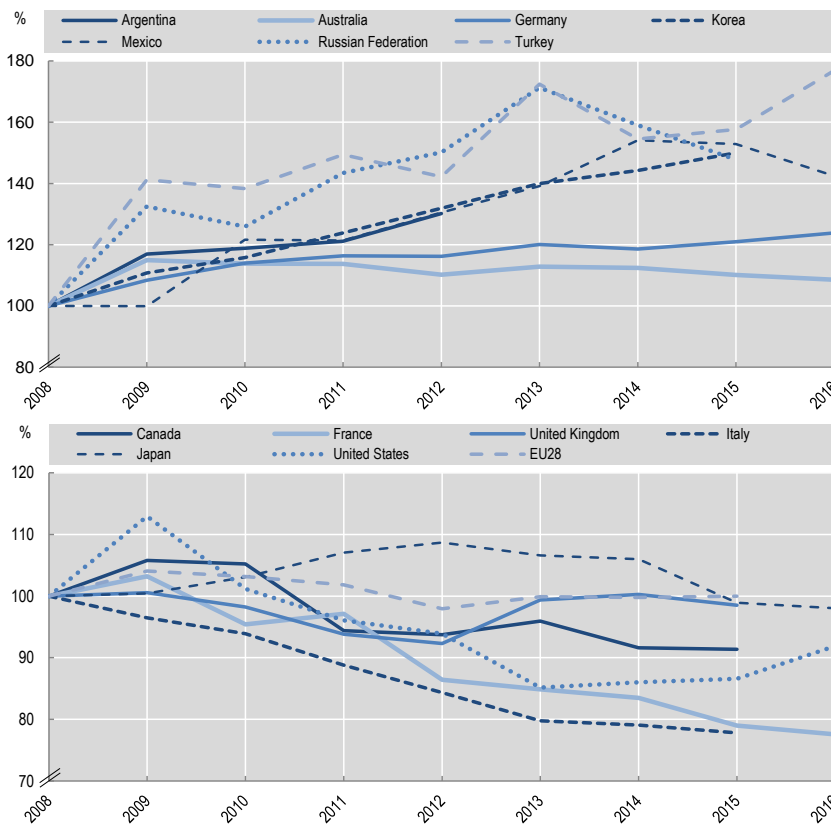


StatLink <http://dx.doi.org/10.1787/888933617377>

Source: OECD Science, Technology and Industry Scoreboard 2017: The Digital Transformation, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_scoreboard-2017-en.

Figure 1.62 Government R&D budgets, selected economies, 2008-16

Constant price index (USD PPP 2008 = 100)

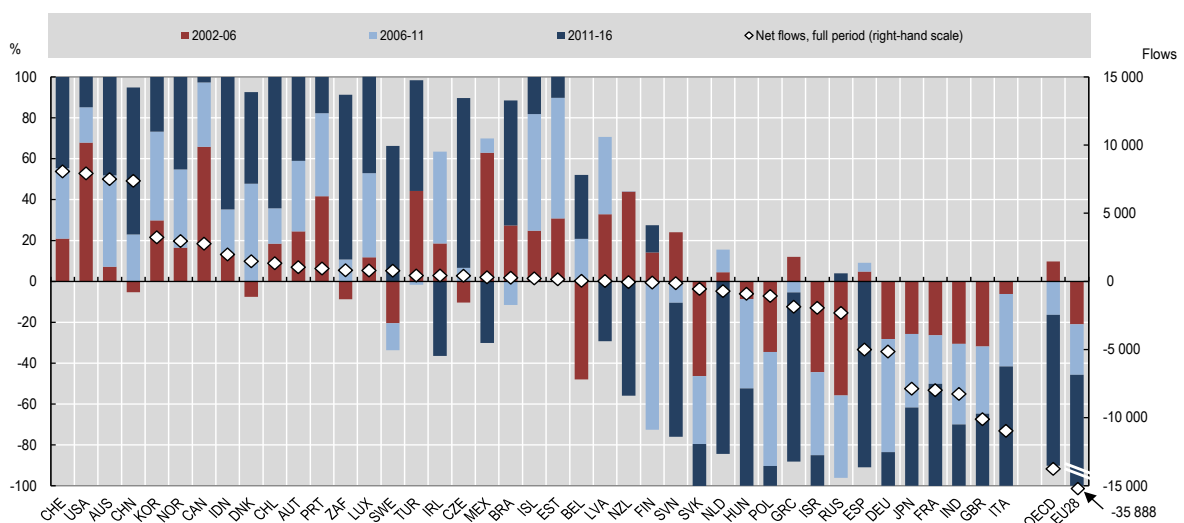


StatLink <http://dx.doi.org/10.1787/888933618023>

Source: OECD Science, Technology and Industry Scoreboard 2017: The Digital Transformation, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_scoreboard-2017-en.

Figure 1.69 International net flows of scientific authors, selected economies, 2002-16

Difference between annual fractional inflows and outflows, as a percentage of total flows



StatLink <http://dx.doi.org/10.1787/888933618156>

Source: OECD Science, Technology and Industry Scoreboard 2017: The Digital Transformation, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_scoreboard-2017-en.

The OECD Science, Technology and Industry Scoreboard 2017: The Digital Transformation



The 2017 edition of the Scoreboard contains over 200 indicators showing how the digital transformation affects science, innovation, the economy, and the way people work and live.

The aim of the STI Scoreboard is not to “rank” countries or develop composite indicators. Instead, its objective is to provide policy makers and analysts with the means to compare economies with others of a similar size or with a similar structure, and monitor progress towards desired national or supranational policy goals.

It draws on OECD efforts to build data infrastructure to link actors, outcomes and impacts, and highlights the potential and limits of certain metrics, as well as indicating directions for further work.

The charts and underlying data in the STI Scoreboard 2017 are available for download and selected indicators contain additional data expanding the time and country coverage of the print edition. For more resources, including online tools to visualise indicators, see the OECD STI Scoreboard webpage (<http://www.oecd.org/sti/scoreboard.htm>).

The OECD Directorate for Science, Technology and Innovation

It is part of the DNA of the Directorate for Science, Technology and Innovation (DSTI) to constantly look for ways of better understanding where our economies and societies are today, and where they are going tomorrow. We pride ourselves on tackling topics at the boundaries of our scientific and technological understanding, such as using biotechnology and nanotechnology to alter modes of production, and how digital shifts like “big data,” earth observation and digital platforms are changing our world.

Discover DSTI at www.oecd.org/sti and the OECD's Going Digital project at www.oecd.org/going-digital.



Further reading

OECD (2017), *OECD Digital Economy Outlook 2017*, OECD Publishing, Paris.
<http://dx.doi.org/10.1787/9789264276284-en>

OECD (2016), *OECD Science, Technology and Innovation Outlook 2016*, OECD Publishing, Paris.
http://dx.doi.org/10.1787/sti_in_outlook-2016-en

This document, as well as any data and any map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. Information on data for Israel: <http://oe.cd/israel-disclaimer>

www.oecd.org/going-digital - goingdigital@oecd.org -  @OECDInnovation - #GoingDigital - <http://oe.cd/stinews>