

## 5. INVESTING IN THE KNOWLEDGE ECONOMY

### 5.2. New doctoral graduates

Doctoral graduates have attained the highest education level and are key players in research and innovation. They have been specifically trained to conduct research. They contribute to the diffusion of knowledge in society.

In 2006, OECD universities awarded 200 000 doctorates to 1.3% of the population at the typical age of graduation. Over 3% of the population at the relevant age obtained a doctorate in Portugal and Switzerland and over 2% in Germany, Sweden, the United Kingdom and Finland. In many OECD countries doctoral degrees have multiplied faster than other university degrees. Since 2000 the number of OECD-area doctorates has increased by 5% a year and the number of first-stage university degrees has grown by 4.6%.

Doctoral programmes have also progressed in emerging countries. In 2006, Brazil, the Russian Federation, India and China combined trained half as many doctoral graduates as OECD countries, taken together. Although graduation rates are lower outside the OECD area, Brazil and the Russian Federation deliver more doctorates per age cohort than the OECD average.

Some countries emphasise doctoral education. In Germany, Portugal, Switzerland and the United Kingdom, graduation rates at doctoral level are high relative to the OECD average while rates at first-stage university level are below the OECD average.

Most doctorates are in science and engineering (S&E), followed by the social sciences. Despite the declining share of S&E doctorates, 40% of OECD doctoral students graduate in scientific fields and more than 50% in Greece, France, Ireland and Sweden. There are proportionally twice as many S&E graduates at doctoral level than at the first-stage university level. The S&E orientation of doctoral programmes is even more pronounced in emerging countries.

More doctorates are awarded in science than in engineering; the opposite holds for the first-stage university level. France and Israel trained almost five scientists for one engineer, Spain and New Zealand four for one, and Germany and Switzerland nearly three for one. However, in Korea doctoral programmes produced twice as many engineers as scientists.

In 2006 EU universities awarded over 99 000 doctorate degrees and half of the total OECD output. The United States and Germany awarded 56 000 (28%) and 25 000 (13%), respectively. The EU's role in doctoral education is even stronger in S&E disciplines. France, Poland and

the United Kingdom had a much higher share of graduates in scientific areas than in other disciplines.

Women are under-represented in advanced research programmes. They are often more present than men at earlier educational levels but fewer pursue doctoral studies. Female participation is weakest in Korea (27.4%), Greece (35.5%) and the Czech Republic (35.7%). In S&E programmes women accounted for just 32% of the OECD total.

#### Advanced research programmes

Doctoral graduates have attained the second stage of university education and obtain a degree at ISCED level 6. They have successfully completed an advanced research programme and gained an advanced research qualification, e.g. Ph.D. They are qualified for faculty posts in institutions offering ISCED 5A programmes. In most countries the theoretical duration of a doctoral programme is three years full-time, although actual enrolment times are typically longer. The completion of an advanced research programme requires the submission of a thesis or dissertation of publishable quality which is the product of original research and represents a significant contribution to knowledge.

#### Sources

OECD, Education Database, 2009

UNESCO, Institute for Statistics, 2009

#### Going further

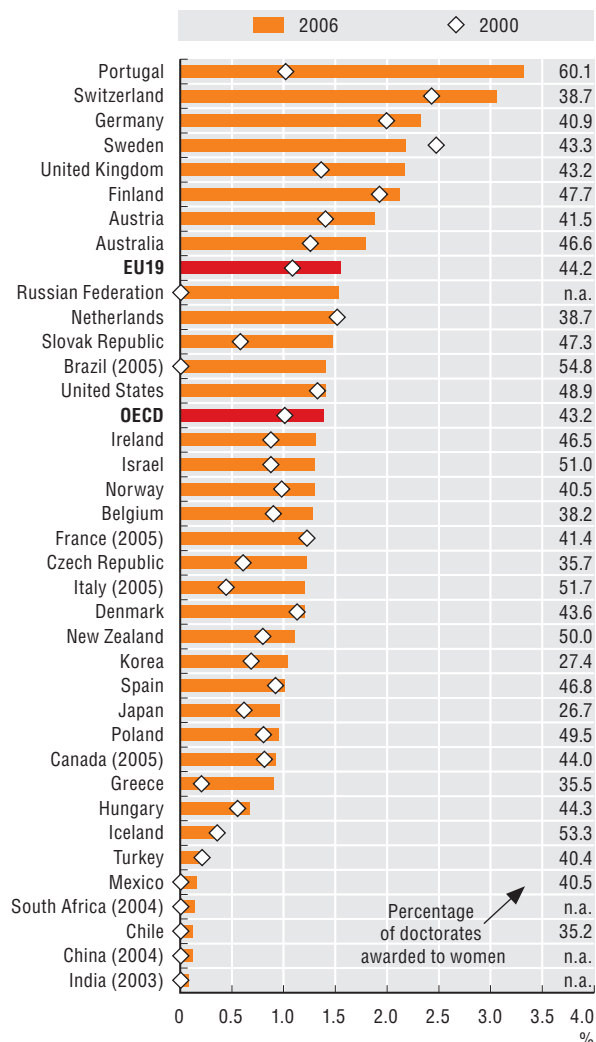
OECD (2008), *Education at a Glance 2008: OECD Indicators*, OECD, Paris, [www.oecd.org/edu/eag2008](http://www.oecd.org/edu/eag2008).

#### Figure notes

Instead of 2000: Iceland, 2001; the Netherlands, 2002; and the United States, 2003.

### Graduation rates at doctoral level, 2000 and 2006

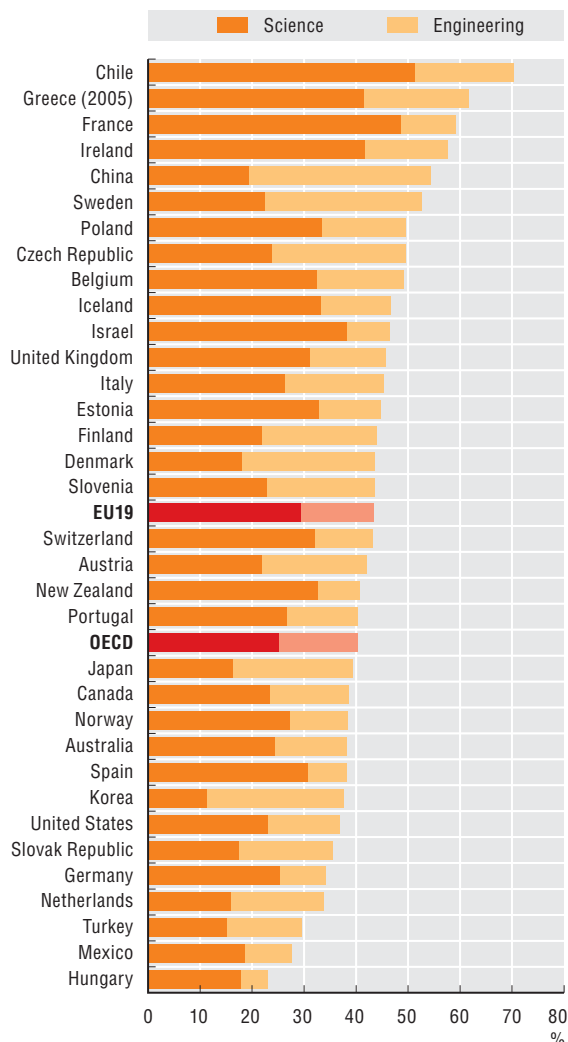
As a percentage of the relevant age cohort



StatLink <http://dx.doi.org/10.1787/746463344715>

### Science and engineering degrees at doctoral level, 2006

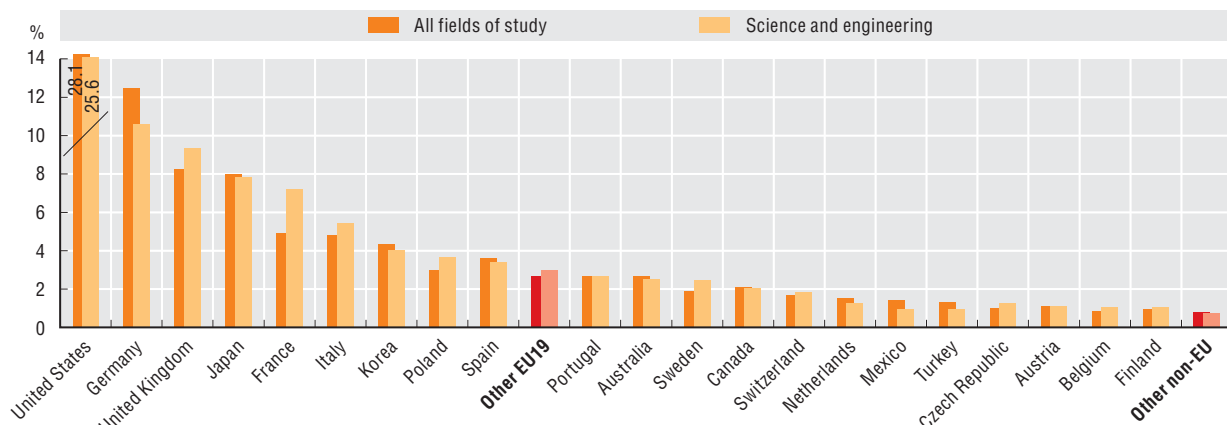
As a percentage of all new degrees at doctoral level



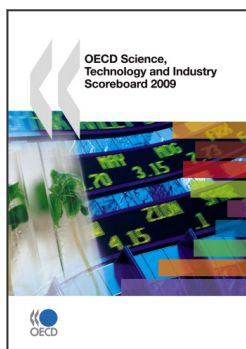
StatLink <http://dx.doi.org/10.1787/746464705616>

### New OECD graduates at doctoral level by main country of graduation, 2006

As a percentage of total OECD new graduates at doctoral level



StatLink <http://dx.doi.org/10.1787/746560622054>



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