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DIRECTORATE FOR EDUCATION
EDUCATION COMMITTEE

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Meeting of the Education Committee at Ministerial Level

BACKGROUND REPORT

This document is a facsimile of the printed document which will be distributed to Ministers. The complete version of this document is available in pdf format only.

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Meeting of OECD Education Ministers

Higher Education: Quality, Equity and Efficiency

27-28 June 2006 / Athens

[Background Report

[Introduction

Higher education has grown and diversified in OECD countries in recent decades. The policies and practices that govern it are developed in a broader social and economic context which influences decision making. This Background Report is intended to provide a statistical and analytical background to support the discussions, based on the questions raised in the issues paper. It contains analysis, findings, description and data related to the topics to be discussed. These include the demographic and economic context; educational attainment and expenditure; employment; and research and innovation. The report draws on existing material and data collection activities in the OECD Directorates for Education (EDU), Employment, Labour and Social Affairs (ELS), Science, Technology and Industry (STI) and Statistics (STD).

Higher Education Terminology

The terms used in this report to denote the different levels of education are defined with reference to the International Standard Classification of Education (ISCED) of 1997, as explained below.

Higher education (Tertiary education, ISCED 5-6) includes Tertiary-type A education (ISCED 5A), Tertiary-type B education (ISCED 5B) and Advanced Research Qualification (ISCED 6).

University-level educational programmes (Tertiary-type A, ISCED 5A) are largely theory-based and are designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements, such as medicine, dentistry or architecture. Tertiary-type A programmes have a minimum cumulative theoretical duration (at tertiary level) of three years' full-time equivalent, although they typically last four or more years. These programmes are not exclusively offered at universities. Conversely, not all programmes nationally recognised as university programmes fulfil the criteria to be classified as tertiary-type A. Tertiary-type A programmes include second degree programmes like the American Master. First and second programmes are sub-classified by the cumulative duration of the programmes, i.e. the total study time needed at the tertiary level to complete the degree.

Advanced vocational education programmes (Tertiary-type B, ISCED 5B) are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labour market, although some theoretical foundations may be covered in the respective programmes. They have a minimum duration of two years full-time equivalent at the tertiary level.

Advanced research qualification (ISCED 6): This level is reserved for tertiary programmes that lead directly to the award of an advanced research qualification, such as a Ph.D. The theoretical duration of these programmes is three years full-time in most countries (for a cumulative total of at least seven years full-time at the tertiary level), although the actual enrolment time is typically longer. The programmes are devoted to advanced study and original research.

Post-secondary non-tertiary educational programmes (ISCED 4) straddle the boundary between upper secondary and post-secondary education from an international point of view, even though they might clearly be considered upper secondary or post-secondary programmes in a national context. Although their content may not be significantly more advanced than upper secondary programmes, they serve to broaden the knowledge of participants who have already gained an upper secondary qualification. The students tend to be older than those enrolled at the upper secondary level.

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1 | Total population

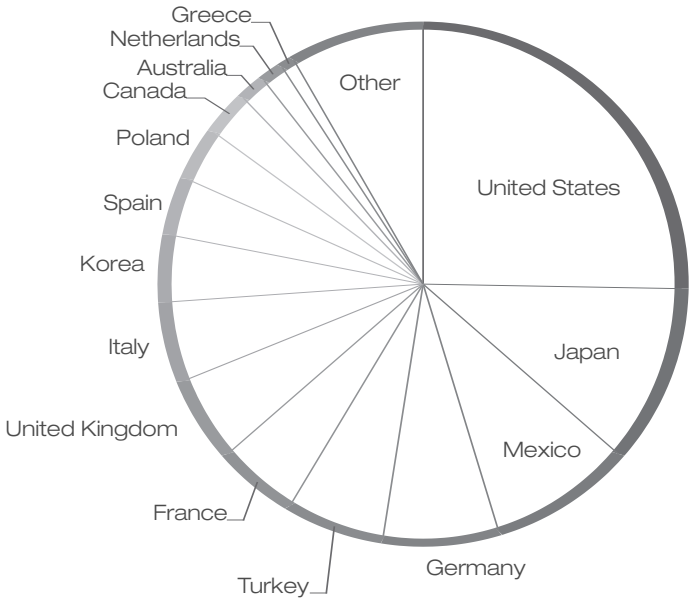
The size and growth of a country's population are both causes and effects of economic and social developments. In 2003, OECD countries accounted for just over 18% of the world's population of 6.3 billion. China accounted for 21% and India for just over 17%. The next two largest countries were Indonesia (3%) and the Russian Federation (2%). Within OECD, the United States accounted for nearly 25% of the OECD total, followed by Japan (11%), Mexico (9%), Germany (7%) and Turkey (6%).

For most OECD countries, population data are based on regular censuses carried out every ten years, with estimates for intercensal years being derived from administrative data such as population registers, notified births and deaths and migration records. In some European countries, including Denmark and the Netherlands, population censuses are no longer carried out and the estimates are based entirely on administrative records.

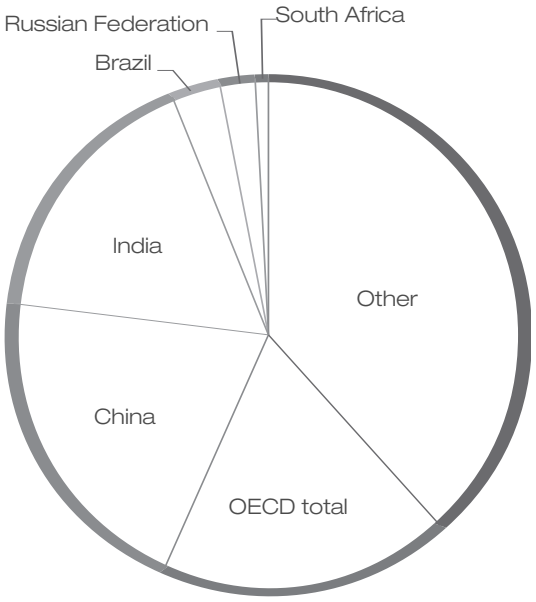
The data refer to the resident population. For countries such as France, the United Kingdom and the United States which have overseas colonies, protectorates or other territorial possessions, their populations are generally excluded.

Total population

OECD population



World population



Source: OECD Factbook 2006: Economic, Environmental and Social Statistics.

2 | Population growth rates

Growth rates are the annual changes in the population and are the result of births, deaths and net migration during the year. The natural increase in population (births minus deaths) has slowed in all OECD countries, resulting in a rise in the average age of populations. In several countries, falling rates of natural increase have been partly offset by immigration from outside the OECD area.

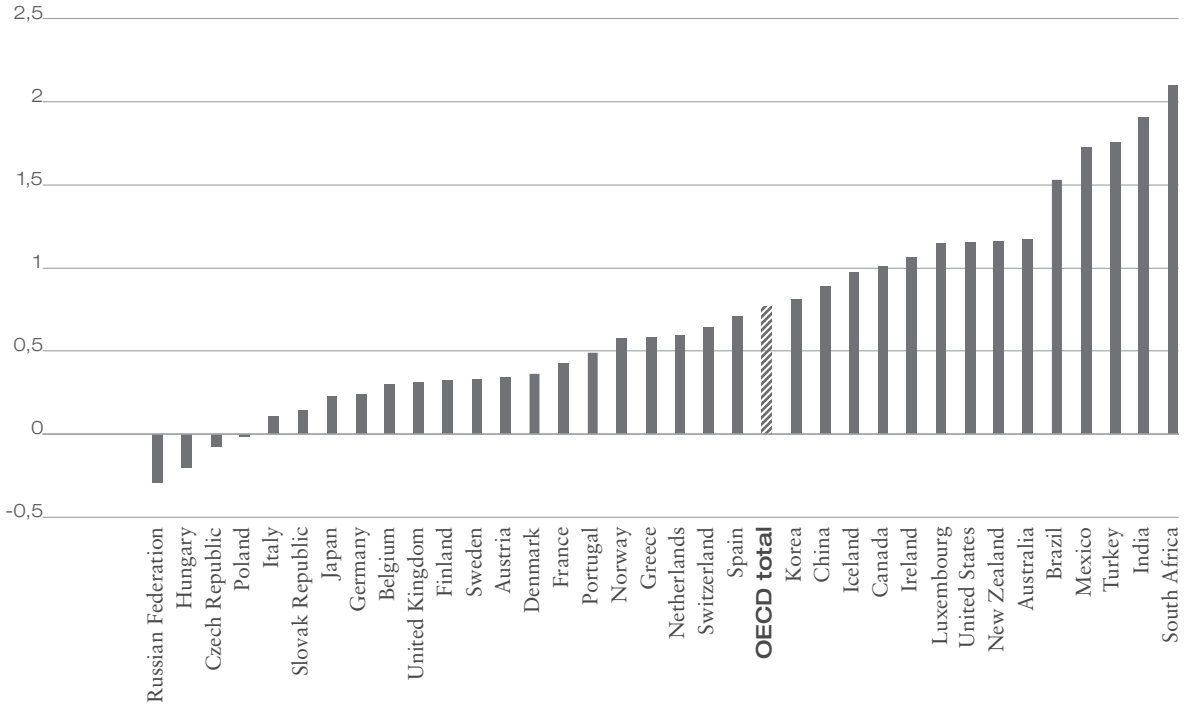
Between 1991 and 2004, population growth rates for all OECD countries averaged 0.8% per annum. Growth rates much higher than this were recorded for Mexico and Turkey (high birth rate countries) and for Australia, Canada, Luxembourg and New Zealand (high net immigration). In the Czech Republic, Hungary and Poland, populations declined from a combination of low birth rates and net emigration. Growth rates were very low, although still positive, in Italy and the Slovak Republic.

The total fertility rate is the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in that period in agreement with the prevailing age-specific fertility rates.

Total fertility rates have declined dramatically over the past few decades, falling on average from 2.7 in 1970 to 1.6 children per woman of childbearing age in 2002. By 2002, the total fertility rate was below its replacement level of 2.1 in all OECD countries except Mexico and Turkey. In all OECD countries, fertility rates have declined for young women and increased at older ages, because women are postponing the age at which they start their families.

Population growth rates

Average annual growth in percentage, 1991-2004 or latest available year



Source: OECD Factbook 2006: Economic, Environmental and Social Statistics.

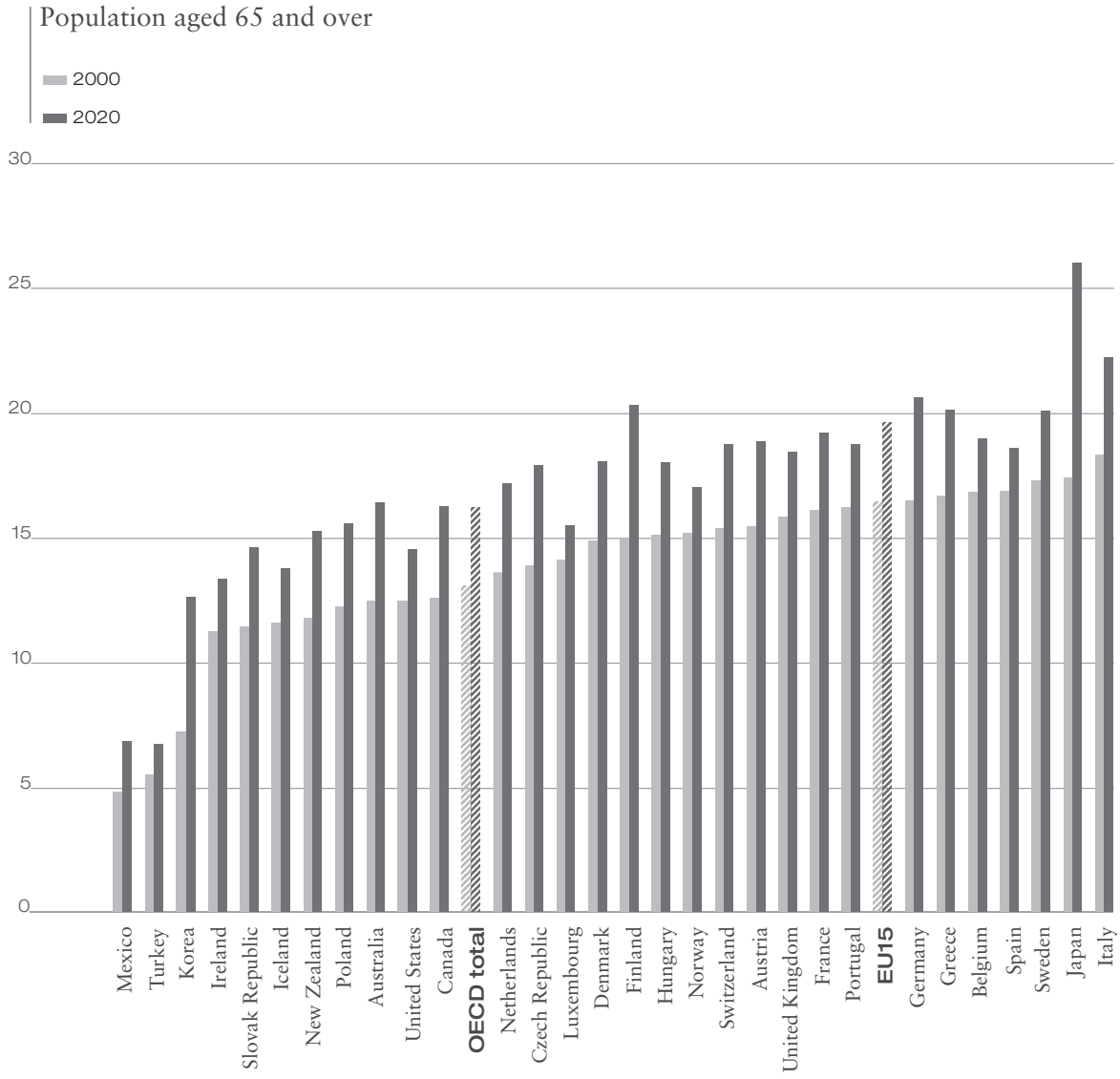
3 | Ageing societies

The percentage of the population that is 65 years or older is rising in all OECD countries and is expected to continue doing so. Dependency ratios are the number of persons 65 or older as a ratio of the numbers in the labour force. These ratios are also increasing throughout OECD countries. These trends have a number of implications for government and private spending on pensions and health care and, more generally, for economic growth and welfare.

The youngest populations (low shares of population aged 65 or over) are either in countries with high birth rates such as Mexico, Iceland and Turkey or in countries with high immigration, such as Australia, Canada and New Zealand. All these countries will, however, experience significant ageing up to 2020.

The dependency ratio is projected to exceed 50% in Hungary, France, Italy and Japan by 2020. This means that, for each elderly person, there will be only two persons in the labour force. The lowest dependency ratios, under 30%, are projected for Mexico, Iceland, Turkey and Ireland.

Over the period from 2000 to 2020, dependency ratios are forecast to rise particularly sharply in the Czech Republic, Finland, Japan, Korea and Turkey; growth of dependency ratios will be lowest in Greece, Ireland, Portugal and Spain.



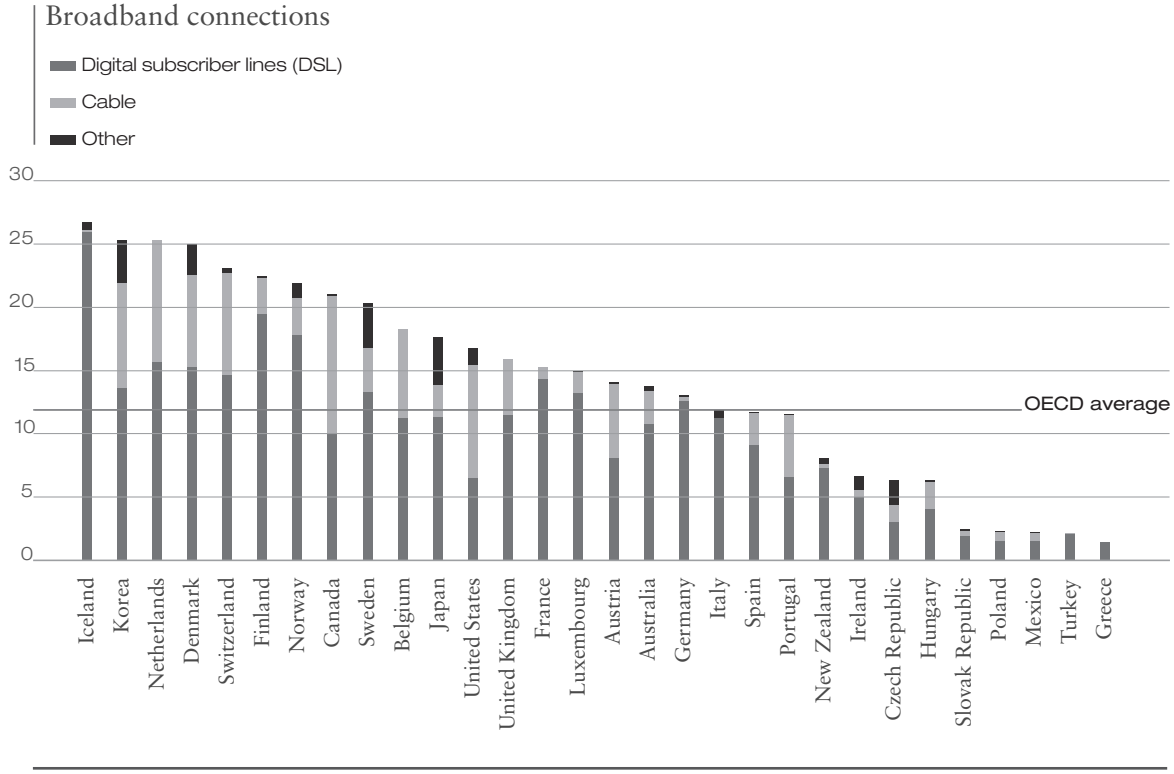
Source: OECD Factbook 2006: Economic, Environmental and Social Statistics.

4 | Broadband connections

The rapid development and diffusion of information technology has led to new ways of learning and scientific research, allowing researchers to engage in more complex and data-intensive areas of research, and has also changed the innovation process, e.g. in allowing greater international co-operation and networking. This process has already been underway for some time, but looks set to continue for some time to come. The uptake of information technologies continues to increase across the OECD, notably in terms of the growth of broadband.

The number of broadband subscriptions in the OECD area increased during 2005 from 136 million in June 2005 to 158 million by December 2005. Broadband penetration growth in the OECD held steady at 15% in the second half of the year reaching 13.6 subscribers per 100 inhabitants in December. In December 2005, four countries (Iceland, Korea, the Netherlands and Denmark) led the OECD in broadband penetration, each with more than 25 subscribers per 100 inhabitants. Iceland now leads the OECD with a broadband penetration rate of 26.7 subscribers per 100 inhabitants.

DSL (digital subscriber lines) is still the leading platform in 28 OECD countries. Cable subscribers outnumber DSL in Canada and the United States. The United States has the largest total number of broadband subscribers in the OECD at 49 million. US broadband subscribers represent 31% of all broadband connections in the OECD. Canada leads the G7 group of industrialized countries in broadband penetration.



Source: OECD, Broadband Statistics, December 2005, see www.oecd.org/sti/ict/broadband

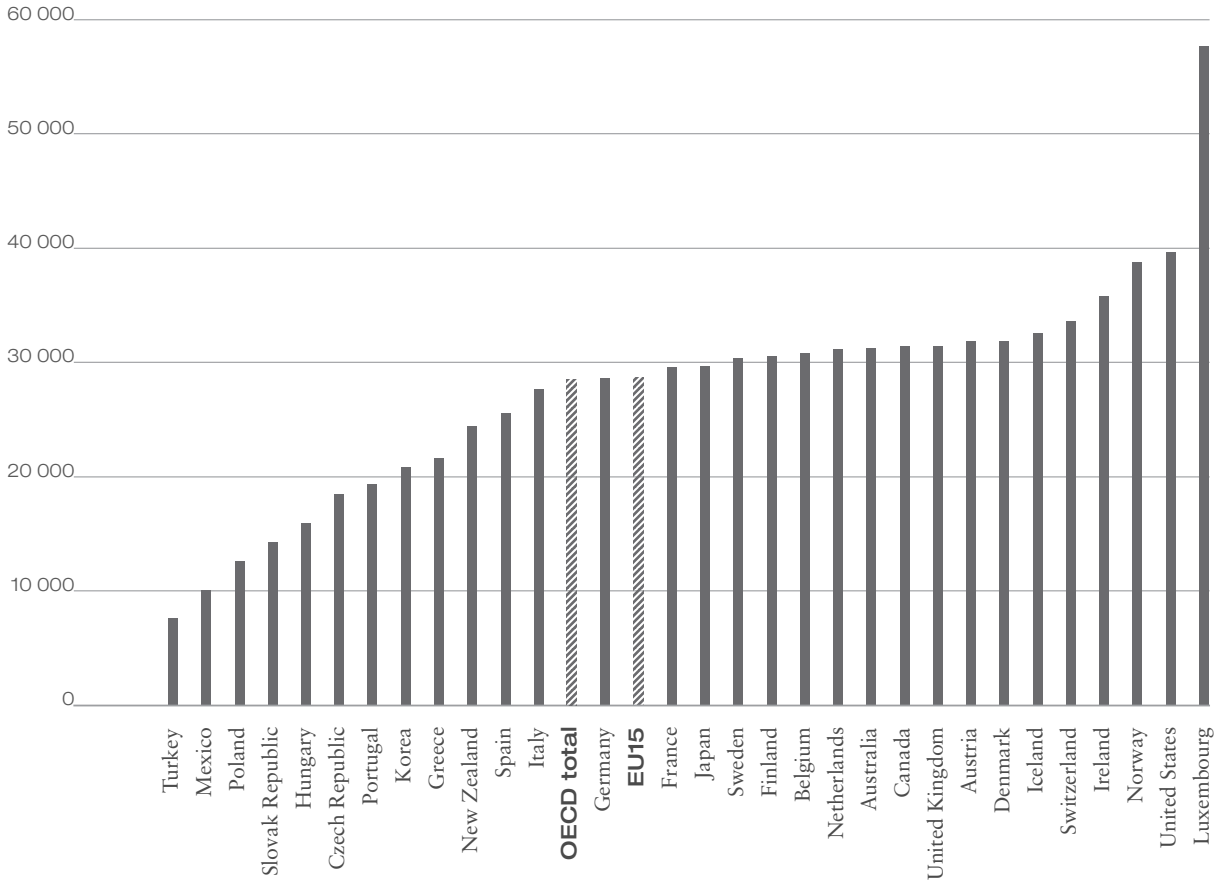
5 | Gross domestic product *per capita*

Gross domestic product (GDP) *per capita* is a broad indicator of economic living standards. Each country calculates GDP in its own currency and, in order to compare countries, these estimates have to be converted into a common currency. Comparisons of real GDP between countries can only be made using purchasing power parities (PPPs) to convert each country's GDP into a common currency.

In terms of total GDP, the United States is, by far, the largest member country. Since 1997, its GDP has exceeded even the combined GDP of the European Union with 15 members. Japan is the second largest economy followed, at some distance, by the four large EU members – Germany, United Kingdom, France and Italy. The next four largest are Spain, Mexico, Korea and Canada. These rankings have not changed significantly over the period shown, although, in 1991, the combined GDP of the EU15 was higher than that of the United States.

Per capita GDP for the OECD as a whole was close to USD 28 500 per head in 2004; this contrasts with a figure of USD 9 300 for the 150 countries generally defined as developing. Six OECD countries had *per capita* GDP in excess of USD 32 000 – Luxembourg, United States, Norway, Ireland, Switzerland and Iceland. Nearly half of the 30 OECD members had *per capita* GDP between USD 25 000 and 32 000, while 10 countries had *per capita* GDP below USD 25 000. Turkey, Mexico and the four new member countries from central Europe had the lowest *per capita* GDP. Note that both GDP and PPPs contain statistical errors, and differences between countries in *per capita* GDP of 5% or less are not significant.

GDP per capita



Source: OECD Factbook 2006: Economic, Environmental and Social Statistics.

6 | Labour productivity

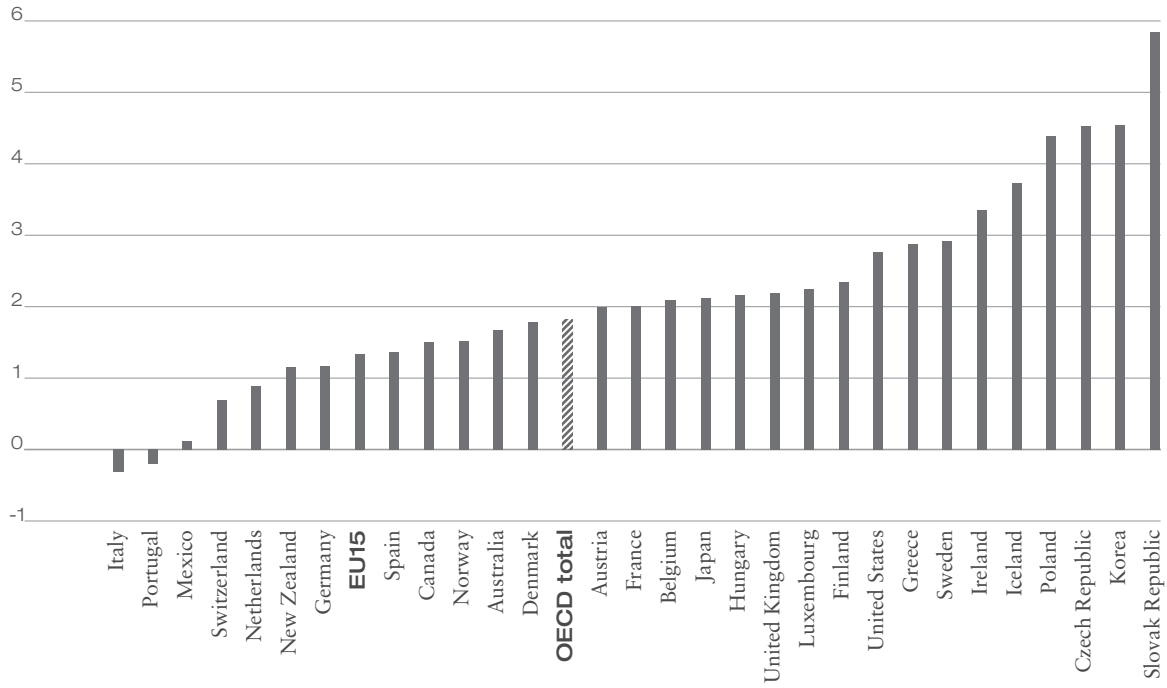
Productivity growth can be measured by relating changes in output to changes in one or more inputs to production. The most common productivity measure is labour productivity, which links changes in output to changes in labour input. It is a key economic indicator and is closely associated with standards of living.

Over the full period since 1991, Italy, Mexico and Switzerland have recorded the lowest growth rates in GDP per hour worked, while Ireland, Korea, and the four new OECD countries from Central Europe have been among the leaders. France, Germany, Japan and the United States all had growth rates near to the OECD average.

This chart focuses on performance in the latest three years. Poland, Korea, the Czech Republic and the Slovak Republic are the clear leaders. In Italy and Portugal, GDP per hour worked has actually declined and average annual growth in Mexico, Switzerland and the Netherlands has been below 1%. Among the larger OECD countries, the United Kingdom, France, Japan and the United States all had growth rates near to the OECD average, while in Canada, Spain and Germany, GDP *per capita* grew at lower rates.

GDP per hour worked

Average annual growth in percentage, 2002-2004 or latest period available



Source: OECD Factbook 2006: Economic, Environmental and Social Statistics.

[Access, Participation, Progression

7 | Educational attainment

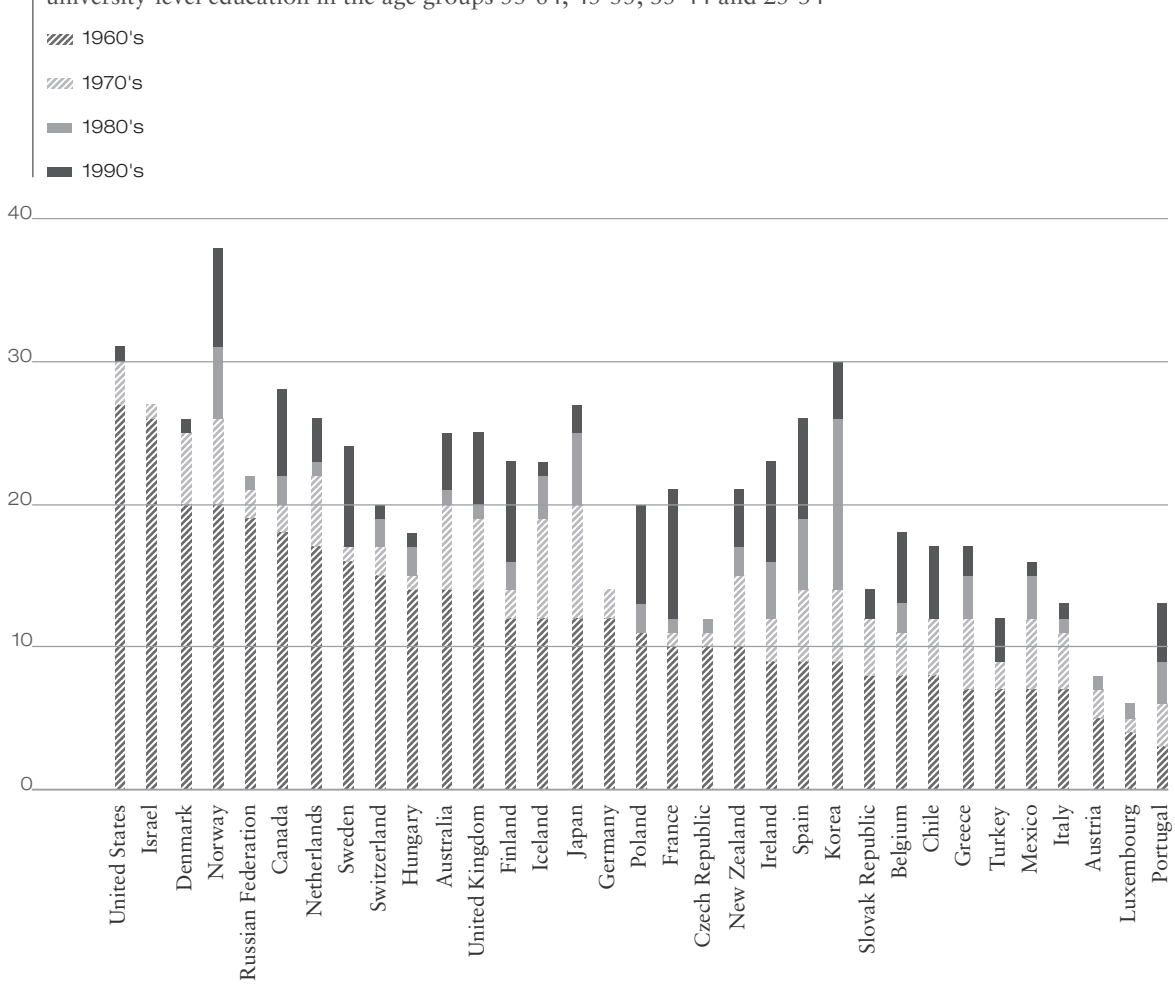
A well-educated and well-trained population is important for the social and economic well-being of countries and individuals. Education plays a key role in providing individuals with the knowledge, skills and competencies to participate effectively in society and the economy. Education also contributes to an expansion of scientific and cultural knowledge. The level of educational attainment of the population is a commonly used proxy for the stock of "human capital", that is the skills available in the population.

A comparison of the levels of educational attainment in younger and older age groups indicates marked progress with regard to the percentage of the population graduating from higher education. In countries in which a high proportion of the population achieves the level of higher education, important increases in attainment are generally seen from one generation to another. Across all OECD countries, an average of 29% of 25-to-34-year-olds attained the level of higher education. In contrast, for 45-to-54-year-olds, the corresponding share was 22%.

The proportion of 25-to-34-year-olds who have attained university-level qualifications is more than 20% in 18 of the 30 OECD countries. This figure represents the result of a dramatic effort to expand educational attainment over the last 40 years. For countries at the top level, the gap in university-level attainment between the oldest and youngest age groups (25-to-34-year olds and 55-to-64-year olds) is about 10 percentage points. The gap is particularly pronounced in Australia, France, Iceland, Ireland, Japan, Korea, New Zealand, Norway, and Spain.

Growth in university-level qualifications (2003)

Approximated by the percentage of persons that attained university-level education in the age groups 55-64, 45-55, 35-44 and 25-34



Source: OECD, Education at a Glance 2005, Table A1.3a.

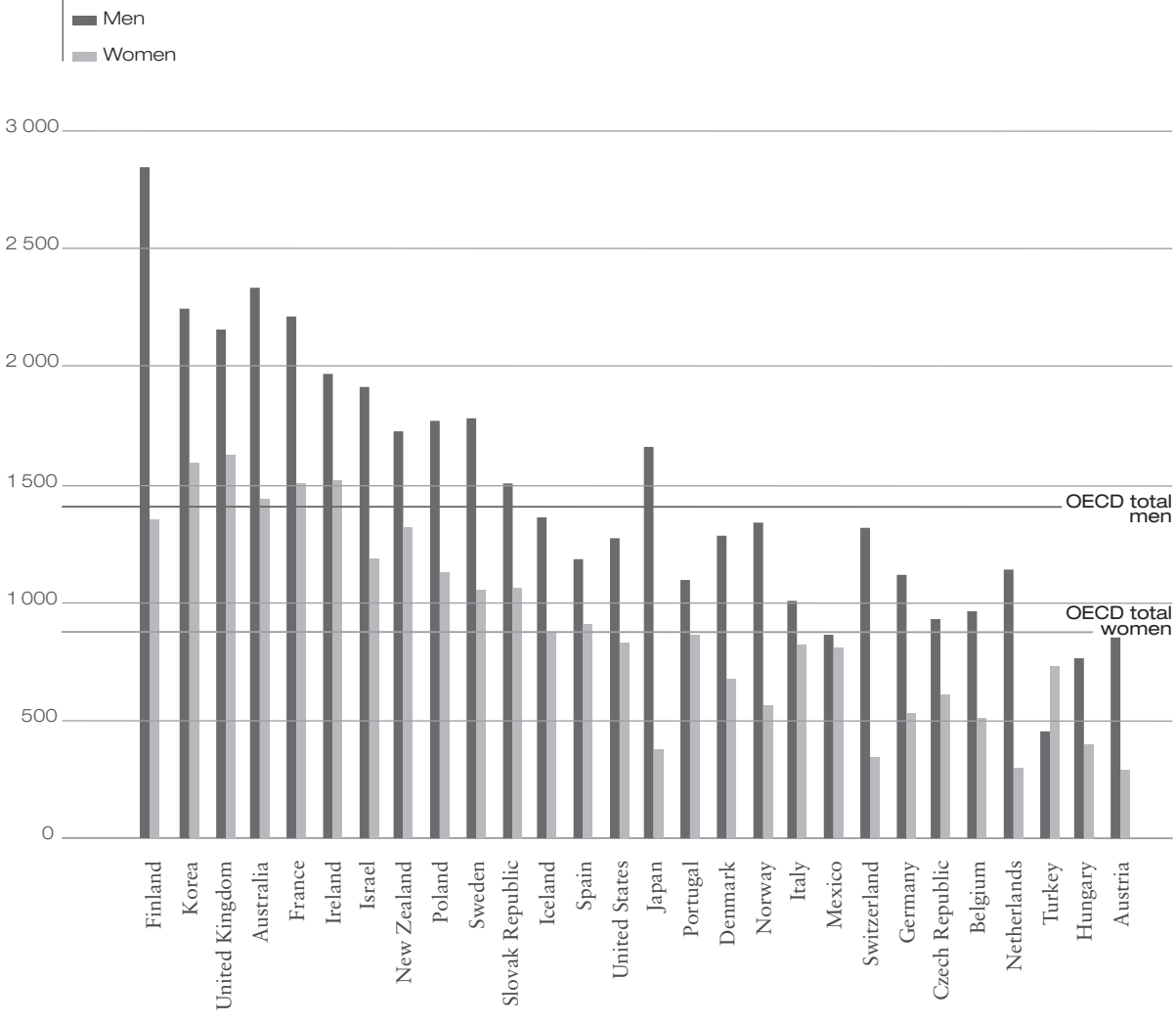
8 | Number of science graduates

Changing opportunities in the job market, differences in earnings among occupations and sectors, and the admission policies and practices of higher education institutions may affect which field students choose to study. In turn, the relative popularity of the various fields of education affects the demand for courses and teaching staff, as well as the supply of new graduates. The distribution of higher education graduates across fields sheds light on the relative importance of the different fields between countries, as well as on the relative proportion of female graduates in those fields.

Examining the number of science graduates per 100 000 25-to-34-year-olds in employment provides another way of gauging the recent output of high-level skills from different education systems. The number of higher education science graduates per 100 000 employed persons ranges from below 700 in Hungary to above 2 200 in Australia, Finland, France, Ireland, Korea and the United Kingdom. This indicator does not, however, provide information on the number of graduates actually employed in scientific fields or, more generally, the number of those using their degree-related skills and knowledge at work. Taking the OECD average, the number of higher education science graduates is three times higher for university-level education and advanced research programmes than for advanced vocational education. Overall, university-level graduation rates for females equal or exceed those for males in 21 out of 27 OECD countries.

On average in OECD countries, 57% of all first university-level graduates are females. However, major differences remain among fields of study. In humanities, arts, education, health and welfare, more than two-thirds of the university-level graduates are females, on average in OECD countries, whereas less than one-third of science graduates are females.

Science university-level graduates per 100 000 employed in the age range 25-34 years (2003)

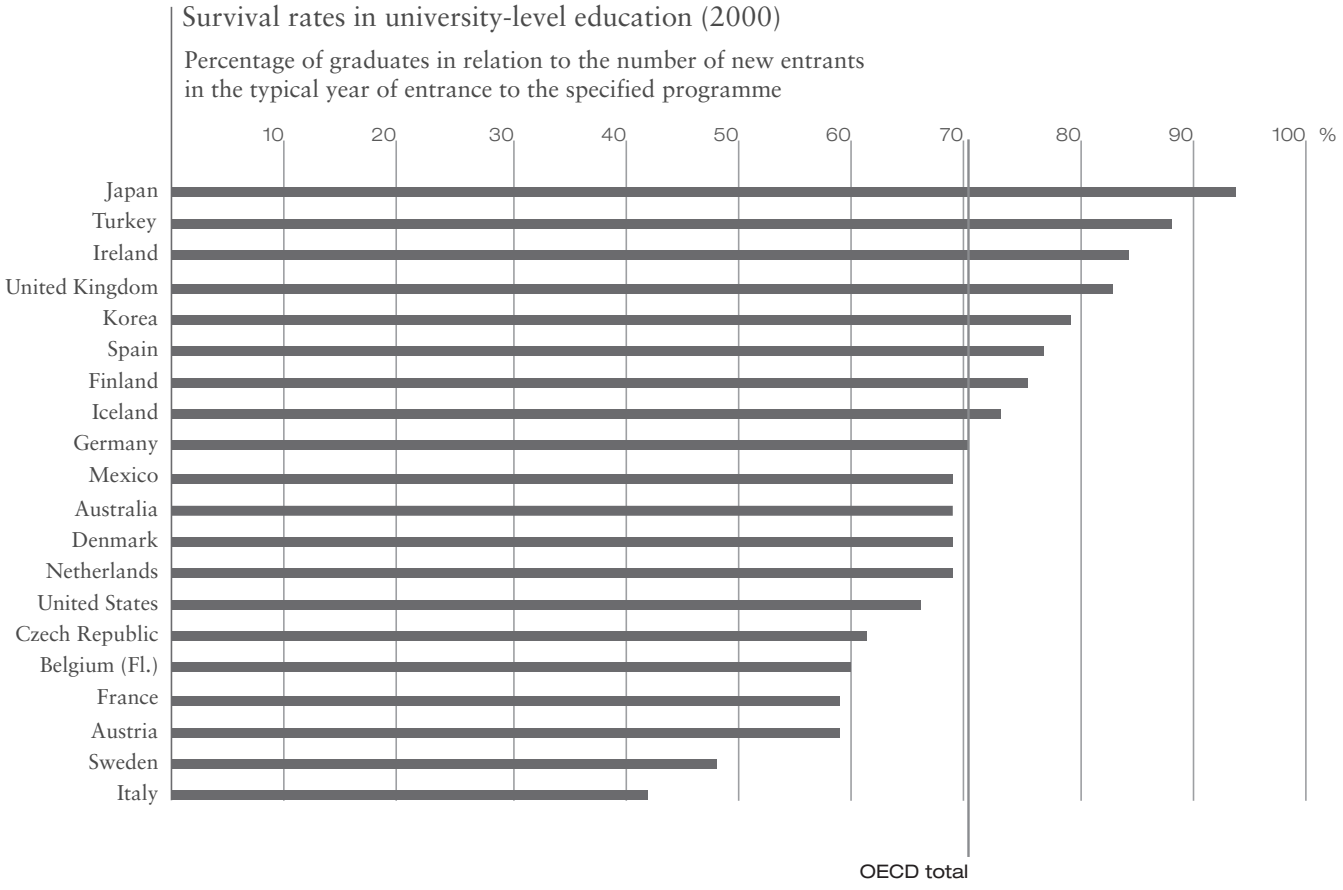


Source: OECD, Education at a Glance 2005, Table A3.2.

9 | Survival rates in university-level education

Higher education dropout and survival rates can be useful indicators of the internal efficiency of higher education systems. However, students' specific reasons for leaving a higher education programme are varied: students may realise that they have chosen the wrong subject or educational programme; they may fail to meet the standards set by their educational institution, particularly in systems that provide broader access; or they may find attractive employment before completing their programme. "Dropping out" is not necessarily an indication of failure by individual students, but high dropout rates may well indicate that the education system is not meeting the needs of its clients. Students may find that the educational programmes offered do not meet their expectations or their labour market needs. Students may also find that programmes take longer than the number of years which they can justify being outside the labour market.

On average, one-third of students in OECD countries "drop out" before they complete their first degree, regardless of whether they are following university level or advanced programmes. The "drop out" rate is much higher for advanced research programmes, with a survival rate of less than 60%. University-level survival rates differ widely among OECD countries, ranging from below 60% in Austria, France, Italy and Sweden to above 80% in Ireland, Japan, Turkey and the United Kingdom. Advanced vocational survival rates range from above 80% in Denmark, the Flemish Community of Belgium, Japan, Mexico, Poland and Sweden, to around 50% in Ireland and Italy.



Source: OECD, Education at a Glance 2005, Table A3.4.

10 | Students with disabilities in higher education

Giving students with disabilities the opportunity to study in higher education institutions enhances their employment participation and at the same time meets economic, political and social goals. It favours employment, responds to the requirements of a knowledge society and meets equity demands by helping to reduce social exclusion. In the past decade, there has been a significant rise in enrolment of students with disabilities in numerous OECD countries. Sweden recorded 125% growth from 1993 to 1998 and France around 100% from 1990 to 2000. In Ontario, Canada, disabled student enrolments at university have risen from 1 668 in 1989-1990 to 6 883 in 2000-2001 (OECD, 2003).

This trend can be explained by inclusion policies that increased the number of students with disabilities in regular settings : in New South Wales, Australia, the proportion of students with disabilities enrolled in mainstream settings increased from 8% in 1988 to 34% in 1997 (OECD, 1999). In France, the number of students with disabilities enrolled at upper secondary level grew by 38% between 1990 and 1999. The focus on quality of teaching at school may have led to better completion for students with disabilities: in the United States the proportion of school leavers with disabilities who had received a high school diploma or certificate of completion increased from 54% to 70% between 1987 and 2003 (Wagner et al, 2005).

Such an evolution reflects the impact of non-discrimination policies developed in the past decade in many OECD countries. Such policies have changed the way disability is understood: instead of describing the difficulties disabled people face in terms of a within-person model, non-discrimination policies pointed to the importance of schools and higher education institutions (HEIs) being able to adapt to meet these students needs. In some countries, such as Canada, legislation (in the province of Ontario) addresses the identification, removal and prevention of barriers which impede persons with disabilities from full participation.

The various forms of statutory support available to both institutions and individuals have also been a key factor in the growth of disabled student enrolment. In financial terms, many countries have taken steps to facilitate work that makes institutions accessible to the disabled. Many countries seek also to provide institutions with methodological support and give them more scope to upgrade the skills of special staff responsible for disabled students. Many institutions employ advisors to give disabled students better access to the financial and technical support to which they are legally entitled and ensure they are in a position to make career choices.

The accessibility of universities and colleges depends on the perspective adopted to assess student needs and deliver appropriate support. Countries that have chosen needs-based approaches have a higher level of accessibility than countries having impairment-based perspectives that link the supports and the subsidies with a status of disability. At the level of the HEIs, the needs perspective requires integrated strategies that enlarge their ability to deliver appropriate services and support to all students and to cope with diversity within the community.

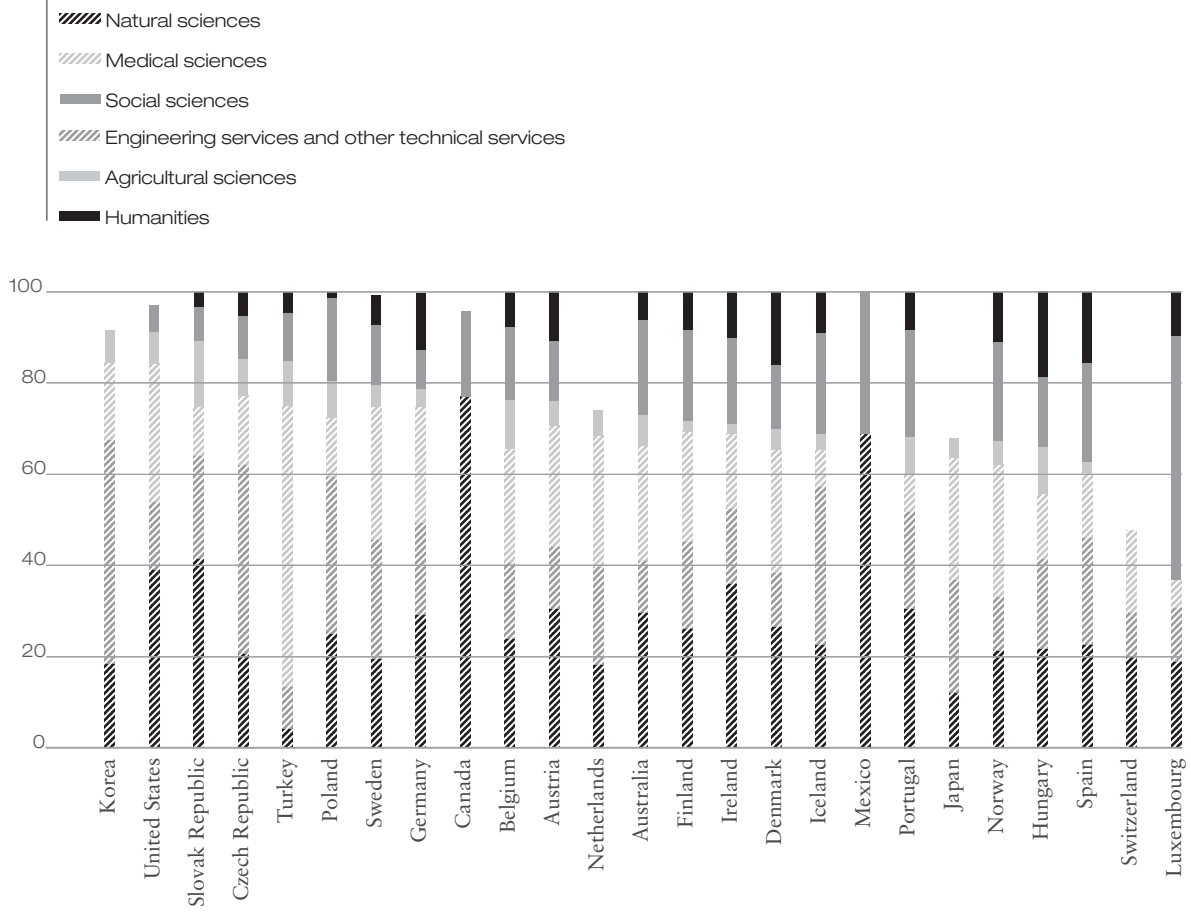
References:
OECD (1999), *Inclusive Education at Work: Students with Disabilities in Mainstream Schools*, OECD, Paris.
OECD (2003), *Disability in Higher Education*, OECD, Paris.
Wagner, M., *et al.* (2005), *After High school: A first look at the postschool experiences of youth with disabilities A report from the National Longitudinal Transition Study-2 (NLTS2)*, SRI International, Menlo Park, CA.

11 | Higher education R&D expenditure by field of study

OECD data allow a breakdown of higher education R&D by field of study. The data show that countries are not equally engaged in all fields of science. In the Slovak Republic and the Czech Republic, over 85% of all research and development is carried out in natural sciences, engineering, medical sciences and agricultural sciences, with social sciences and humanities accounting for only a small share. In some other OECD countries, such as Hungary, Norway and Spain, around 35% of all higher education R&D is carried out in social sciences and humanities. These differences may be linked to the specialisation of science systems in different countries.

Higher education R&D expenditure by field of science[1], 2003

As a percentage of total higher education R&D expenditure



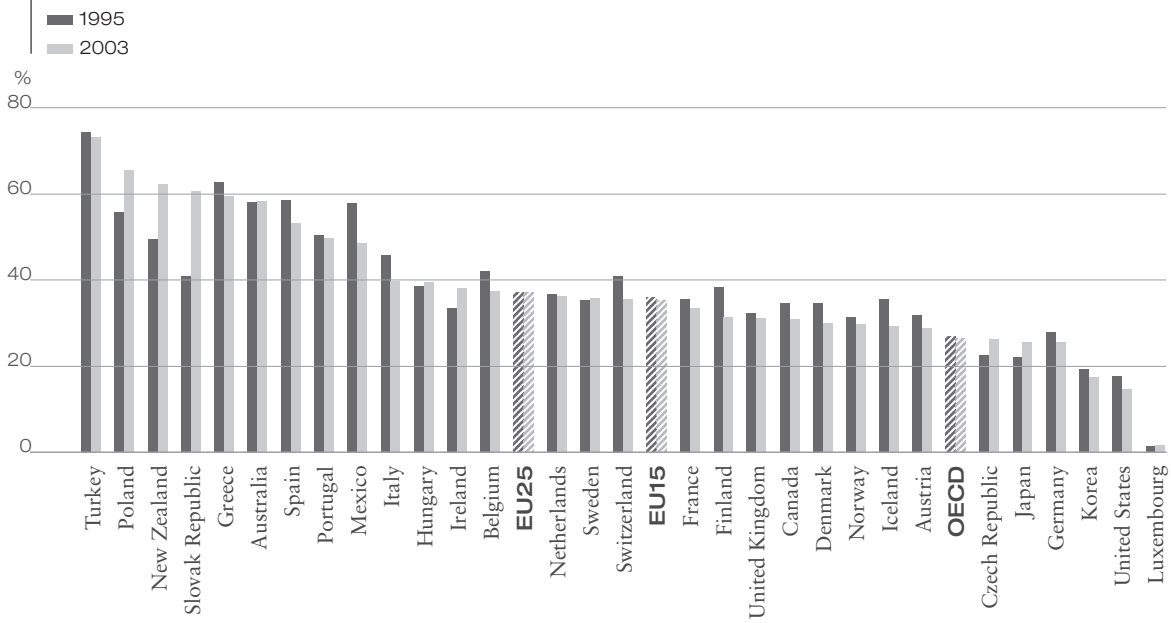
Note: 1) In Korea, R&D in social sciences and the humanities is excluded, as is R&D in the humanities in the United States.
Source: OECD, R&D Statistics (RDS), November 2005.

12 | Higher education researchers

Researchers are viewed as the central element of the research and development system. They are defined as professionals engaged in the conception and creation of new knowledge, products, processes, methods and systems and are directly involved in the management of projects. In 2002, approximately 3.6 million researchers were engaged in research and development (R&D) in the OECD area. This corresponds to about 8.3 researchers per 1 000 employees, a significant increase from the 1995 level of 7 researchers per 1 000 employees. Out of these 3.6 million researchers, most were engaged in the business sector and just over 25% were engaged in the higher education sector. The lowest shares of higher education researchers in all researchers are found in Germany, Japan, Korea and the United States, which is linked to the large share of business R&D in total R&D in these countries. The highest shares of higher education researchers can be found in New Zealand, Poland and Turkey. On average, the share of higher education researchers in the total number of researchers has changed relatively little over the period from 1995 to 2003.

Higher education researchers, 1995-2003

As a percentage of all researchers



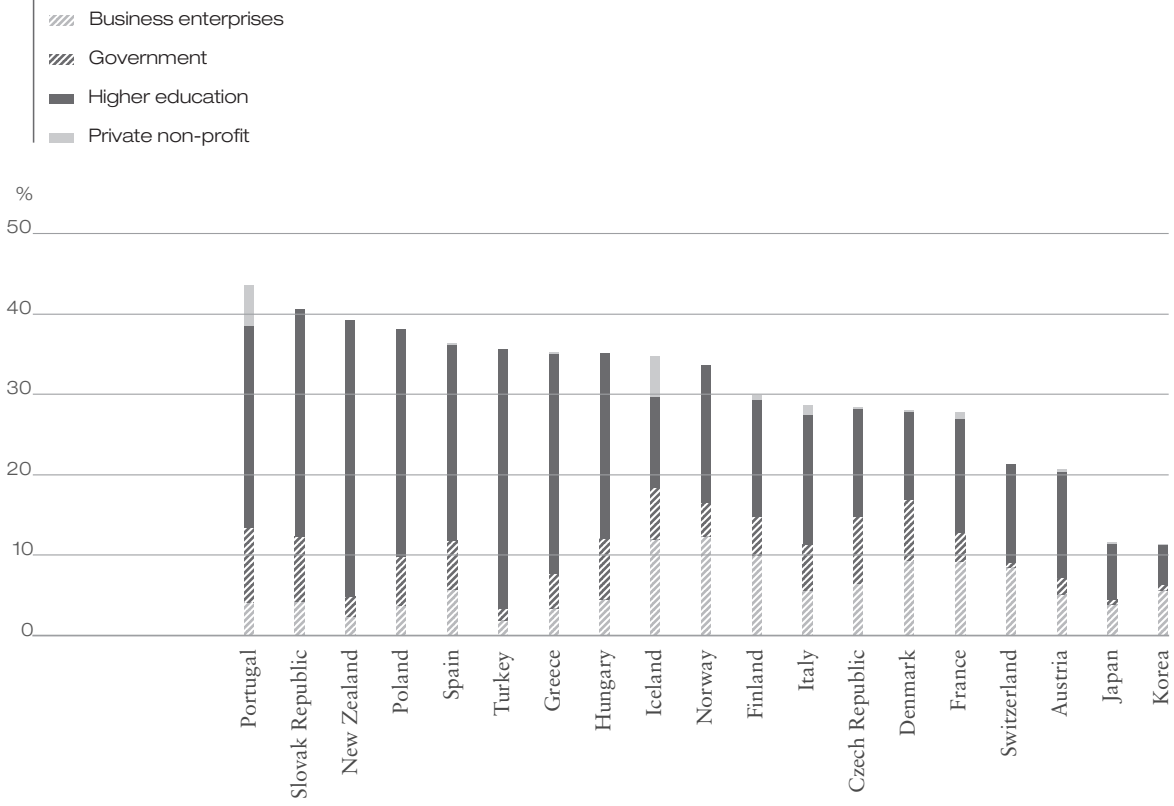
Source: OECD, Main Science and Technology Indicators, 2005-2, November 2005.

13 | Women researchers

The under-representation of women in R&D activities is increasingly gaining the attention of policy makers. In most countries for which data are available, women represent only between 25% and 35% of total researchers. While women represent over 40% of researchers in Portugal and the Slovak Republic, they represent only 11% in Japan and Korea. Women researchers are principally found in the higher education sector and their participation is particularly low in the business sector, which employs the largest number of researchers in most countries. This is partly linked to the uneven distribution of women science and technology graduates across fields of study, with few women engaged in engineering and more in life sciences and social sciences.

Women researchers, 2003

By sector of employment, as a percentage of total researchers



Source: OECD, Main Science and Technology Indicator Database, May 2005.

[Expenditure on Higher Education

14 | Expenditure per student

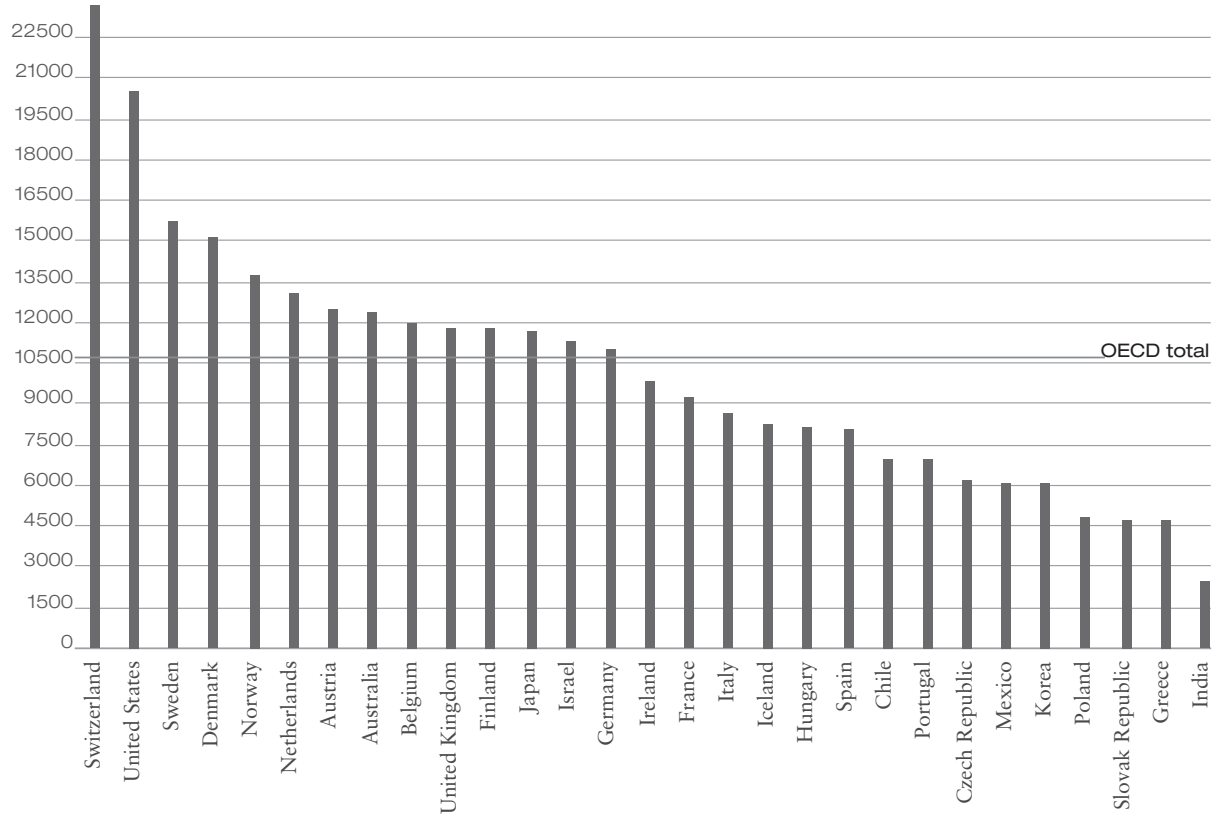
Effective schools require the right combination of trained and talented personnel, adequate facilities, state-of-the-art equipment and motivated students ready to learn. The demand for high-quality education, which can translate into higher costs per student, must be balanced against placing undue burden on taxpayers. As a result, the question of whether the resources devoted to education yield adequate returns to the investments made figures prominently in the public debate. Although it is difficult to assess the optimal volume of resources required to prepare each student for life and work in modern societies, international comparisons of spending on education per student can provide a starting point for evaluating the effectiveness of different models of educational provision.

Even if overall spending per student is similar in some OECD countries, the way in which resources are allocated across the different levels of education varies widely. Spending on education per student in the typical OECD country, as represented by the simple mean across all OECD countries, amounts to USD 5 313 at the primary level, USD 7 002 at the secondary level and USD 10 655 in higher education.

Expenditure on higher education per student ranges from USD 4 731 in Greece to more than USD 20 000 in Switzerland and the United States. On average, expenditure on R&D in higher education represents one-quarter of all higher education expenditure. In 5 out of 20 OECD countries for which higher education expenditure is separated by type of services, R&D expenditure in higher education institutions represents more than 35% of expenditure on higher education. On a per-student basis, this can translate into significant amounts, as in Austria, Finland, Germany, the Netherlands and Sweden, where expenditure for R&D in higher education institutions amounts to more than USD 4 000 per student.

Annual expenditure per student in higher education (2002)

on educational institutions, in equivalent US dollars converted using PPPs



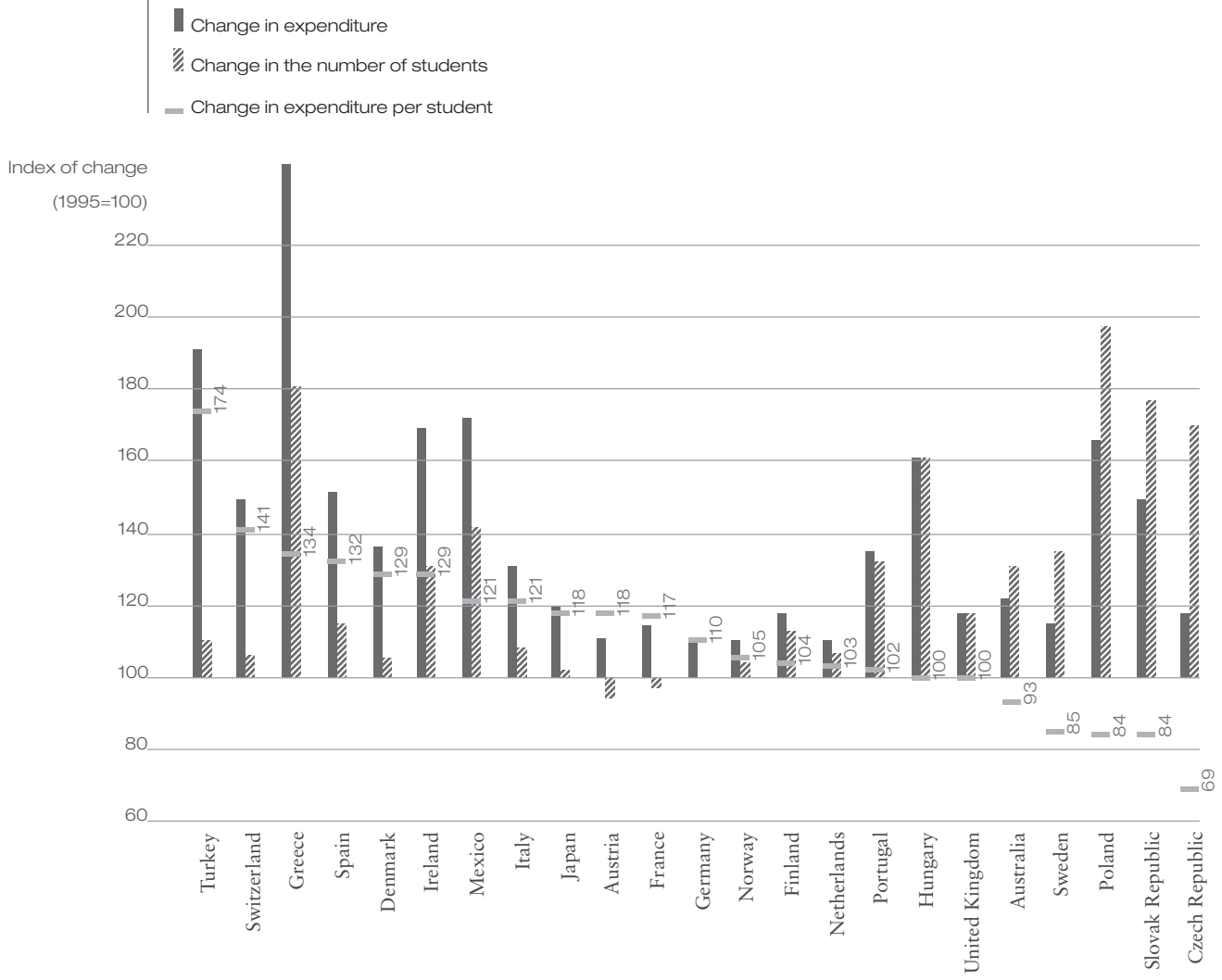
Source: OECD, Education at a Glance 2005, Table B1.1.

15 | Changes in expenditure per student

Policy makers must balance the importance of improving the quality of educational services with the desirability of expanding access to educational opportunities, notably at the level of higher education. The comparative review of how trends in educational expenditure per student have evolved shows that in many OECD countries the expansion of enrolments, particularly at the level of higher education, has not always been paralleled by changes in educational investment.

Although institutional arrangements are often slow in adapting to changing demographic conditions, changes in enrolments do not seem to have been the main factor driving changes in expenditure per primary, secondary and post-secondary non-tertiary student. The pattern is different at the level of higher education. In 5 out of 23 OECD countries for which data are available – Australia, the Czech Republic, Poland, the Slovak Republic and Sweden – expenditure on higher education per student declined between 1995 and 2002. In all of these countries, this was mainly the result of a rapid increase (more than 30%) in the number of students in higher education during the same period. On the other hand, expenditure per student in higher education rose significantly in Greece, Ireland and Mexico despite a growth in enrolment of 81, 31 and 42%, respectively. Austria and France were the only OECD countries in which the number of students in higher education declined.

Changes in spending per student in higher education relative to different factors (1995=100, 2002 constant prices)



Source: OECD, Education at a Glance 2005, Table B1.4.

16 | Cumulative expenditure per student

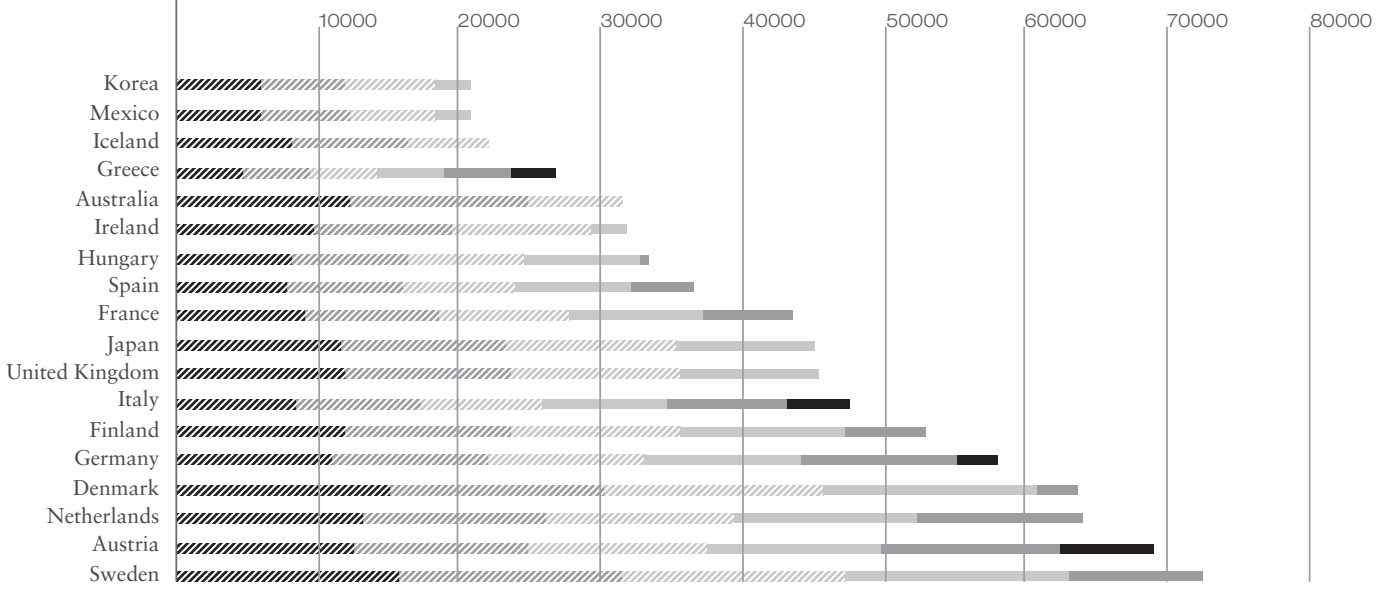
Both the typical duration and the intensity of higher education vary among OECD countries. Therefore, the differences among countries in annual expenditure on educational services per student, as shown in this chart, do not necessarily reflect the variation in the total cost of educating the typical student in higher education.

Comparatively low annual expenditure on education per student can result in comparatively high overall costs of higher education if the typical duration of studies is long. This chart shows the average expenditure that is incurred per student throughout the course of higher education studies. The figures account for all students for whom expenditure is incurred, including those who do not finish their studies. Although the calculations are based on a number of simplified assumptions and therefore should be treated with some caution, some striking shifts can be noted in the rank order of OECD countries between the annual and aggregate expenditure.

For example, annual spending per student in higher education in Japan is about the same as in Austria (USD 11 716 in Japan compared with USD 12 448 in Austria). But because of differences in the degree structure, the average duration of studies is almost two years longer in Austria than in Japan (5.5 years in Austria, compared with 3.8 years in Japan). As a consequence, the cumulative expenditure for each higher education student is almost USD 20 000 higher in Austria than in Japan (USD 68 959 compared with USD 45 095).

Cumulative expenditure on educational institutions
per student over the average duration of higher education (2002)

Equivalent US dollars converted using PPPs



Note: Each segment of the bar represents the annual expenditure on educational institutions per student.
The number of segments represents the number of years a student remains on average in higher education.
Source: OECD, Education at a Glance 2005, Table B1.3.

17 | Expenditure on educational institutions as percentage of GDP

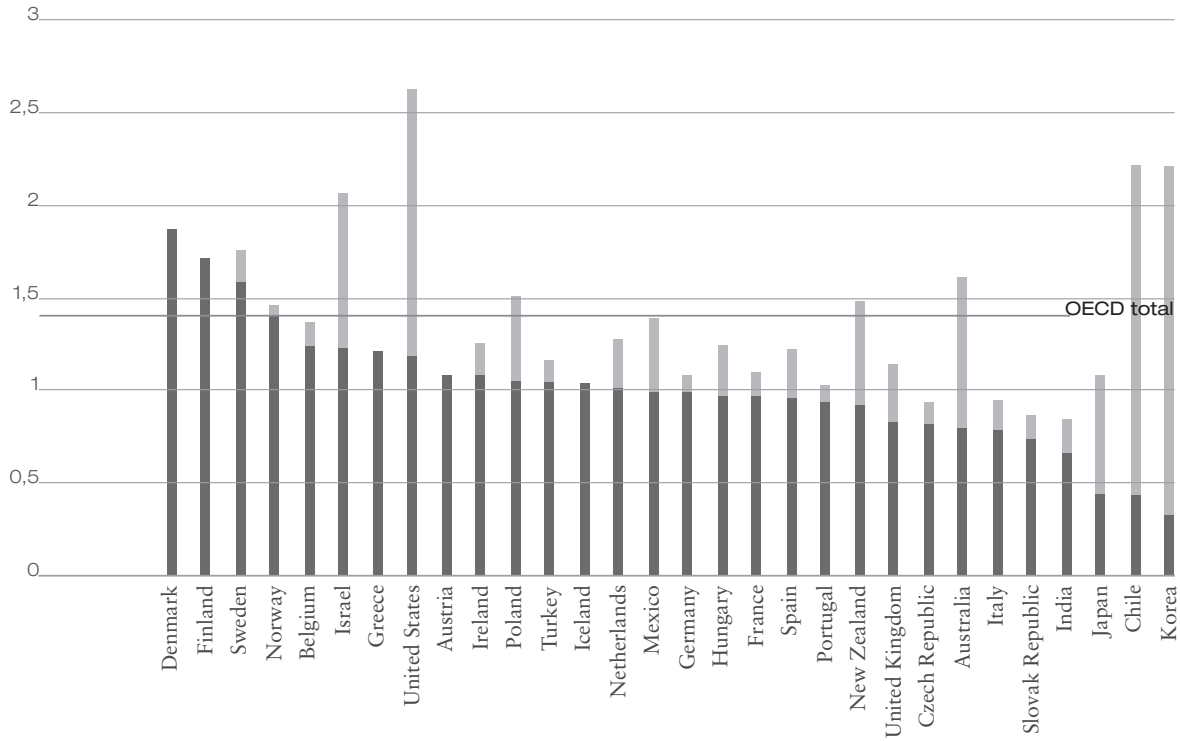
Expenditure on education is an investment that can help to foster economic growth, enhance productivity, contribute to personal and social development, and reduce social inequality. Relative to gross domestic product, expenditure on education shows the priority given to education in a country in terms of allocating its overall resources. The proportion of total financial resources devoted to education is one of the key choices made in each OECD country; this is an aggregate choice made by government, enterprise and individual students and their families.

All OECD countries invest a substantial proportion of national resources in education. Taking into account both public and private sources of funds, OECD countries as a whole spend 6.1% of their collective GDP on their educational institutions at the pre-primary, primary, secondary and higher education levels.

More than one-quarter of combined OECD expenditure on educational institutions is accounted for by higher education. At this level of education, pathways available to students, programme durations and the organisation of teaching vary greatly between OECD countries, which leads to greater differences in the level of expenditure allocated to higher education. Korea and the United States spend 2.2 and 2.6%, respectively, of their GDP on higher education institutions and these two countries are also those with the highest proportion of private expenditure at the level of higher education. Australia, Denmark, Finland and Sweden also show high spending levels, with 1.6% or more of GDP devoted to higher education institutions. On the other hand, France, Iceland, Mexico, Portugal, Switzerland and the United Kingdom spend slightly below the average proportion of GDP on higher education institutions but are among the OECD countries with the highest proportion of GDP spent on primary, secondary and post-secondary non-tertiary education.

Investment in higher education

Expenditure on higher education institutions as a percentage of GDP (2002)



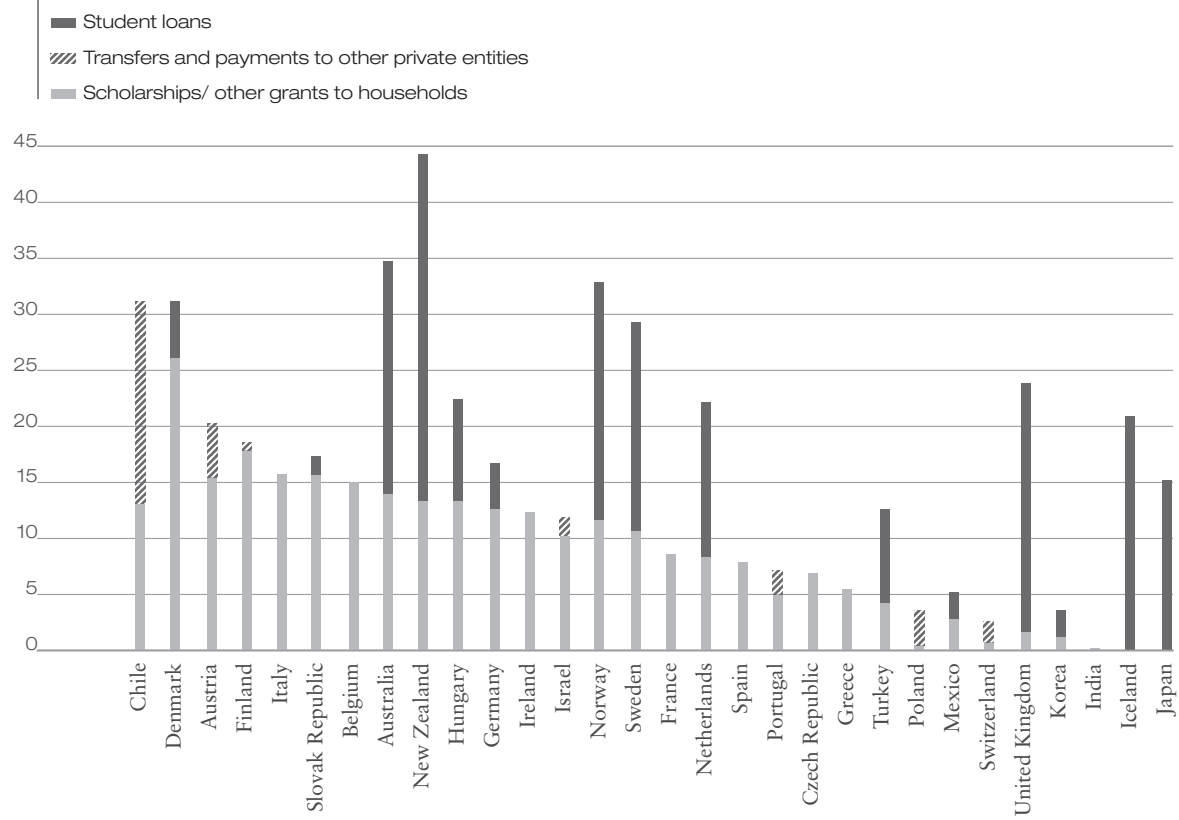
Source: OECD, Education at a Glance 2005, Table B2.1b.

18 | Public subsidies in higher education

Subsidies to students and their families are policy levers through which governments can encourage participation in education, particularly among students from low-income families, by covering part of the cost of education and related expenses. Governments can thereby seek to address issues of access and equality of opportunity. The success of such subsidies must therefore be judged, at least in part, through examination of indicators of participation, retention and completion. Furthermore, public subsidies play an important role in indirectly financing educational institutions.

This chart shows different forms of public subsidies for education to households and other private entities as a percentage of total public expenditure on education, by type of subsidy and considers whether financial subsidies for households are provided in the form of grants or loans. An average of 17% of public spending on higher education is devoted to supporting students, households and other private entities. In Australia, Denmark, New Zealand, Norway and Sweden, public subsidies account for about 29% or more of public higher education budgets. Twelve out of 27 reporting OECD countries rely exclusively on grants or scholarships and transfers and payments to other private entities at the level of higher education. The remaining OECD countries provide both grants or scholarships and loans to students (except Iceland, which relies only on students loans). In general, the highest subsidies to students are provided by those OECD countries offering student loans; in most cases these countries spend an above-average proportion of their budgets on grants and scholarships alone.

Public subsidies for education in higher education (2002)
Percentage of total public expenditure on education

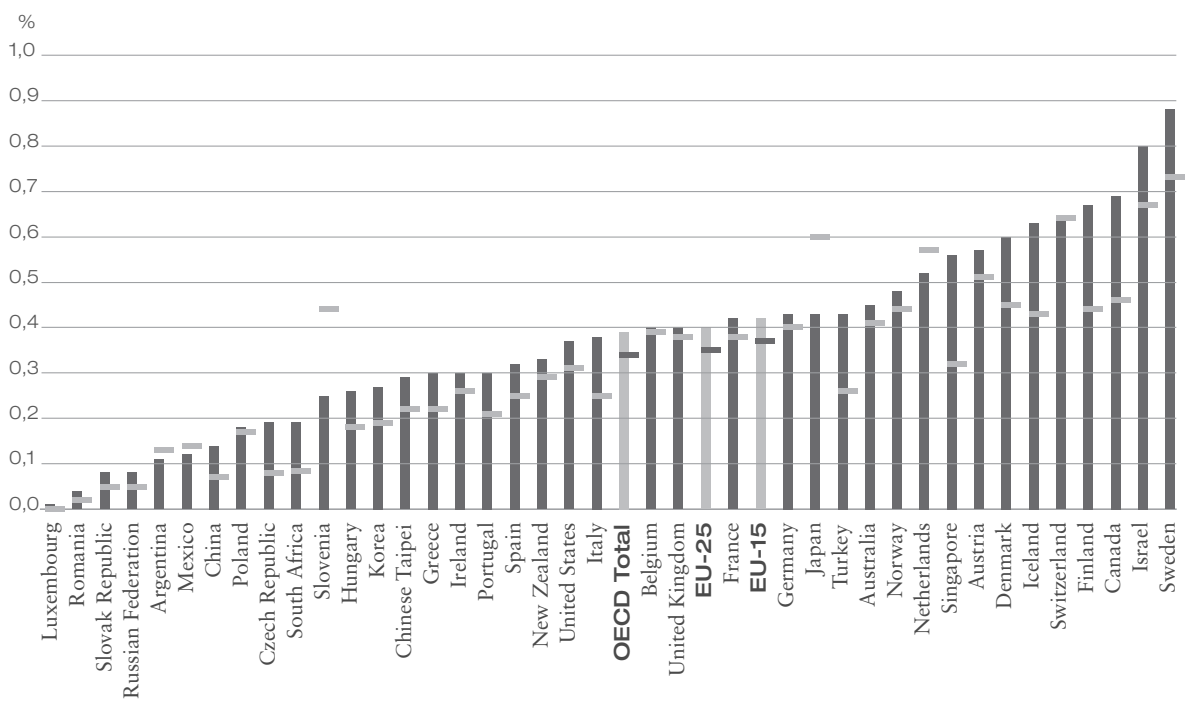


Source: OECD, Education at a Glance 2005, Table B5.2.

19 | Research and development in higher education

Higher education institutions make a growing contribution to research and development (R&D) in OECD countries. For the OECD as whole, their R&D spending as a percentage of GDP increased from 0.34% of GDP in 1995 to 0.39% of GDP in 2003. The largest increases in R&D spending by higher education institutions occurred in Canada, Finland and Iceland. R&D spending by higher education institutions as a percentage of GDP declined in Mexico and the Netherlands over this period. Sweden has the highest ratio of higher education R&D to GDP in the OECD area, at almost 0.9% in 2003, followed by Canada, Finland, Switzerland, Iceland and Denmark. Luxembourg had the lowest ratio in 2003, which was also the year it established its university. Other OECD countries with low R&D spending by higher education institutions are the Slovak Republic, Mexico and Poland. Most large OECD countries, including the United States, Japan, Germany, France, Italy and the United Kingdom, devote between 0.35 and 0.45% of GDP on R&D in higher education institutions. In several non-member economies, including China and South Africa, higher education R&D also increased substantially over the past decade.

Higher education expenditure on R&D as a percentage of GDP, 1995 and 2003



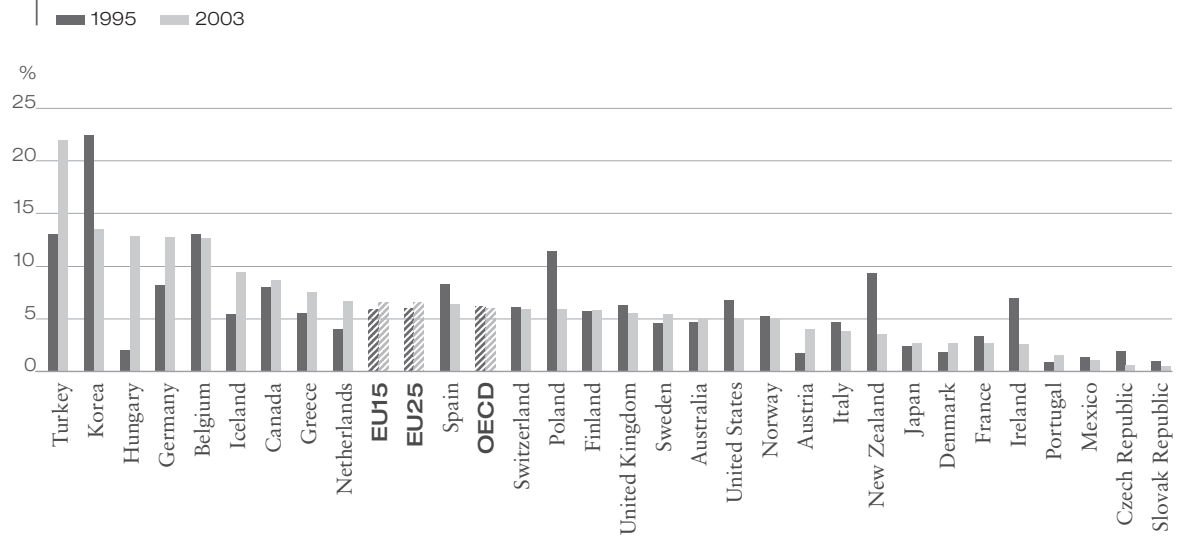
Source: OECD, Main Science and Technology Indicators 2005/2, November 2005.

20 | Higher education R&D financed by industry

Co-operation among actors in science and innovation systems takes many forms and is often difficult to quantify. Direct financial flows for R&D between government and the business enterprise sector are one way to track such linkages. Likewise, business funds a growing share of the R&D performed in the higher education and government sectors, averaging 6.1% in 2003 in the OECD area (and 6.5% in the EU25). In spite of increases in many countries, these flows still represent less than 7% in most large OECD economies, Germany being an important exception, with almost 13% of higher education R&D being financed by the business sector. Turkey had the highest share of higher education R&D financed by the business sector in 2003, at 22%. In the Czech Republic and the Slovak Republic, hardly any research in the higher education sector was financed by the business sector.

Percentage of higher education R&D financed by industry 1995-2003

As a percentage of total higher education R&D



Source: OECD, Main Science and Technology Indicators 2005/2, November 2005.

[The Returns on Higher Education

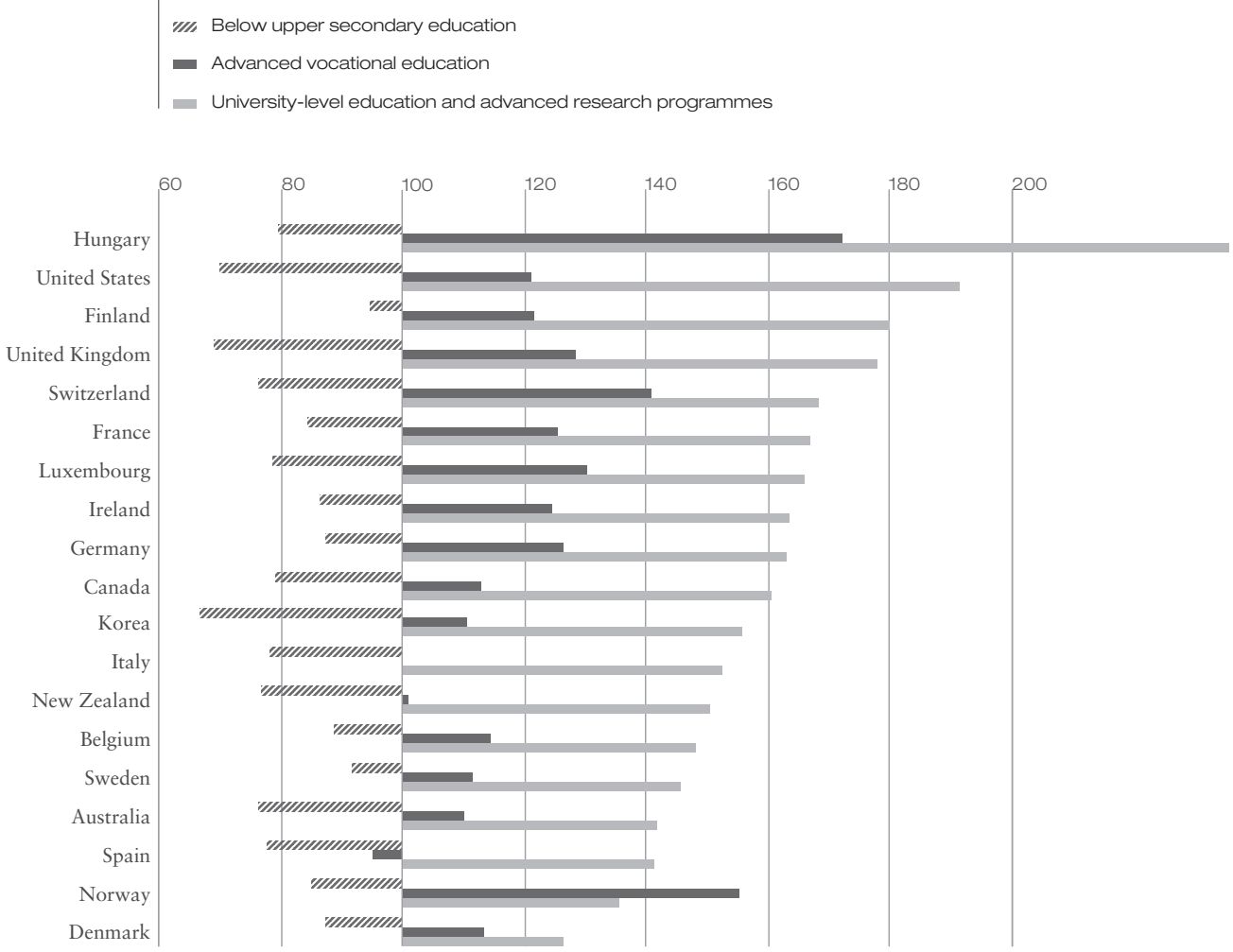
21 | Education and earnings

One way in which markets provide incentives for individuals to develop and maintain appropriate levels of skills is through wage differentials, in particular through the enhanced earnings accorded to persons with higher levels of education. The pursuit of higher levels of education can also be viewed as an investment in human capital. Human capital includes the stock of skills that individuals maintain or develop, usually through education or training that produces an economic return in the form of earnings in the labour market. The higher the earnings that result from increases in human capital, the higher the returns on that investment and the premium paid for enhanced skills and/or for higher productivity.

This chart shows a strong positive relationship between educational attainment and average earnings. In all countries, graduates of higher education earn substantially more than upper secondary and post-secondary non-tertiary graduates. Earnings differentials between those who have higher education and those who have upper secondary education are generally more pronounced than the differentials between upper secondary and lower secondary or below, suggesting that in many countries upper secondary (and with a small number of exceptions, post-secondary non-tertiary) education forms a break-point beyond which additional education attracts a particularly high premium.

The earnings advantage of education

Relative earnings of 25-64-year-olds with income from employment (upper secondary education=100)



Source: OECD, Education at a Glance 2005, Table A9.1a.

22 | Differences in earnings between females and males

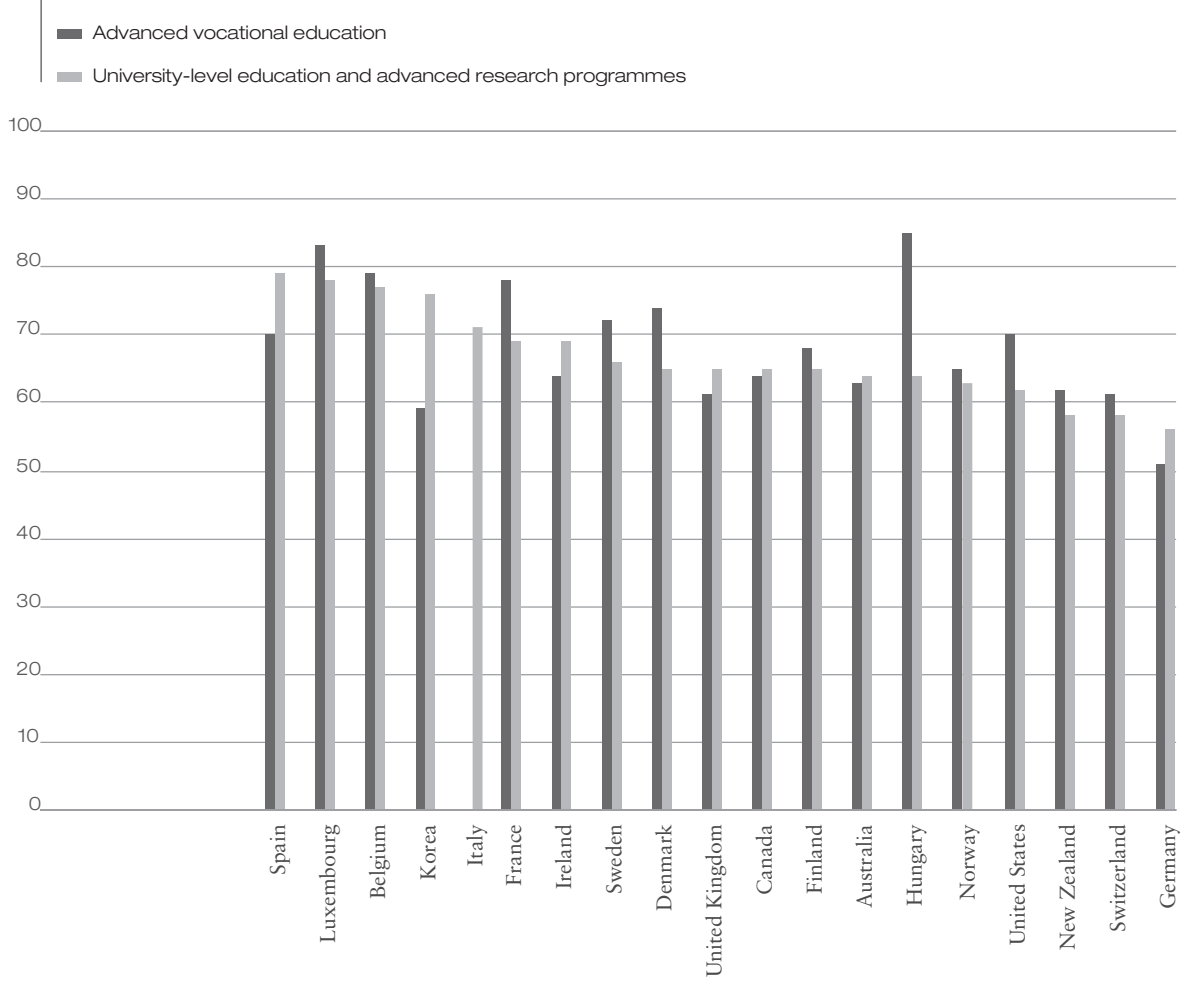
Although both males and females with upper secondary, post-secondary non-tertiary or higher education attainment have substantial earnings advantages compared with those of the same gender who do not complete upper secondary education, earnings differentials between males and females with the same educational attainment remain substantial

Females still earn less than males with similar levels of educational attainment. For a given level of educational attainment, women typically earn between 60 and 80% of what men earn. When all levels of education are taken together (i.e. total earnings are divided by the total number of income earners, by gender), the earnings of females between the ages of 30 and 44 range from 50% of those of males in Switzerland to 86% of those of males in both Hungary and Luxembourg.

The gap in earnings between males and females may be explained in part by different choices of career and occupation, differences in the amount of time that males and females spend in the labour force, and the relatively high incidence of part-time work among females (part-time employment is excluded in Belgium, Hungary, Luxembourg and the United States).

Differences in earnings between females and males in higher education

Average annual earnings of females as a percentage of males by level of educational attainment of 30-to-44-year-olds



Source: OECD, Education at a Glance 2005, Table A9.1b.

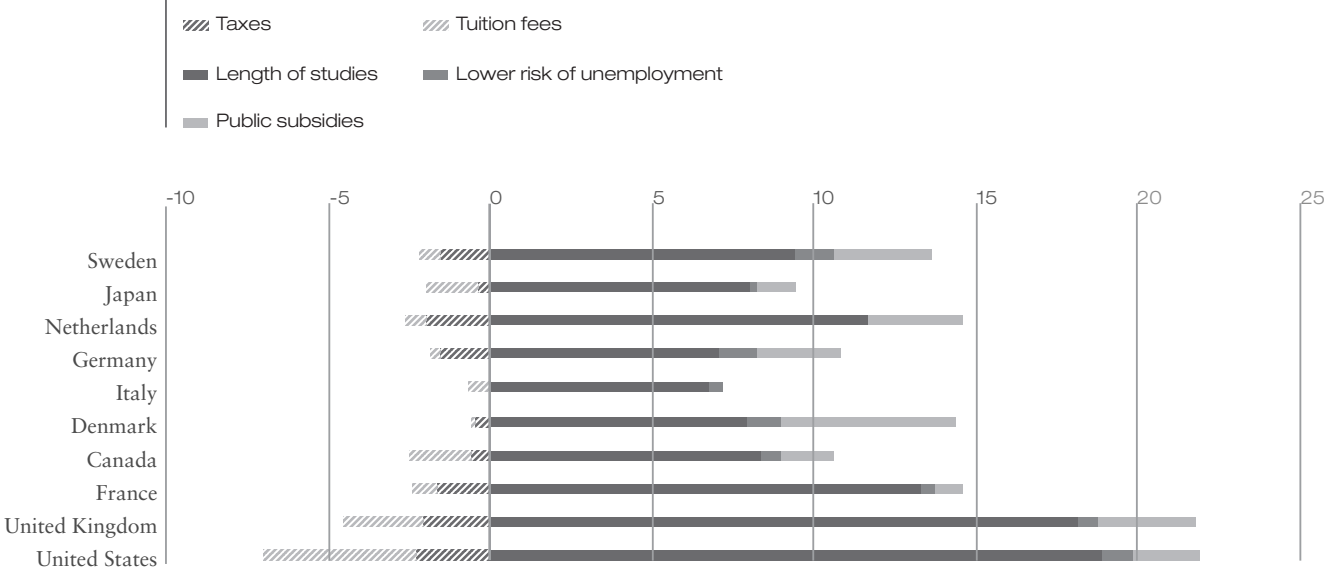
23 | Private internal rate of return of higher education

The rate of return represents a measure of the returns obtained, over time, relative to the cost of the initial investment in education. It is expressed as a percentage and is analogous to percentage returns from investing in a savings account. In its most comprehensive form, the costs equal tuition fees, plus foregone earnings net of taxes adjusted for the probability of being in employment, minus the resources made available to students in the form of grants and loans. The benefits are the gains in post-tax earnings adjusted for higher employment probability minus the repayment, if any, of public support during the period of study. The calculations assume that the student is in full-time education and has no work activity, and hence no earnings while studying. The calculated rates of return are, however, likely to be biased upwards as unemployment, retirement and early retirement benefits are not taken into account. The rate of return calculations reported in this indicator do not take into account the non-monetary benefits of education.

For studies in higher education, three groups of countries can be identified depending on the estimated values of the internal rate of return, which includes the combined effect of earnings, length of studies, taxation, unemployment risk, tuition fees and public student support. First, with its very high rewards from higher education, the United Kingdom is in a group of its own. Second, Denmark, France, the Netherlands, Sweden and the United States have relatively high internal rates of return, ranging from 10 to 15 %. Third, in the remaining countries, rates are below 10 %, with the lowest rates recorded for Italy and Japan.

The returns of high level qualifications

Private internal rates of return (RoR) for an individual obtaining a higher-education degree (ISCED 5/6) from an upper secondary and post-secondary non-tertiary level of education (ISCED 3/4), MALES



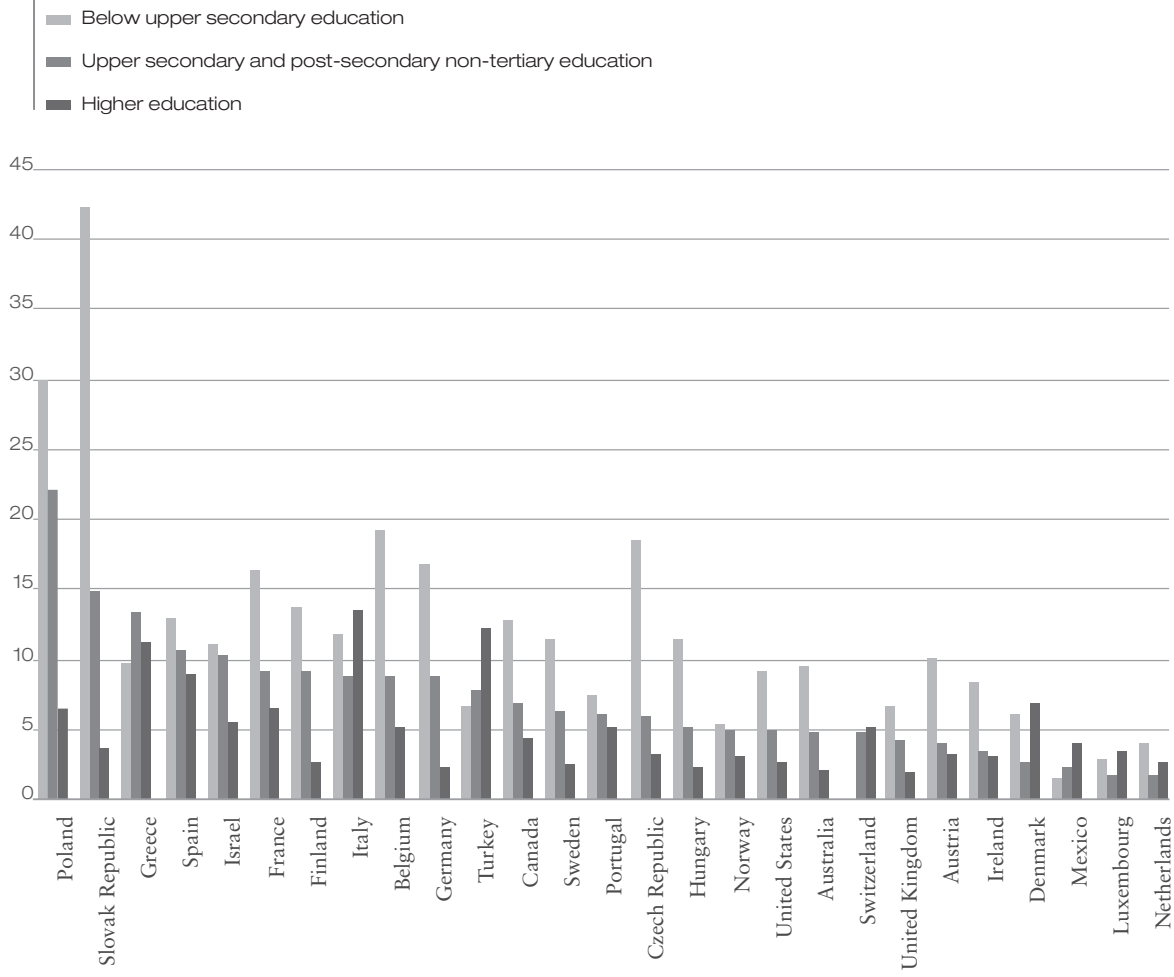
Source: OECD, Education at a Glance 2003, Table A14.3.

24 | Education and work status (25-to-29-year-olds)

All OECD countries are experiencing rapid social and economic changes that are making the transition to working life more uncertain. In some OECD countries, education and work largely occur consecutively, while in other OECD countries they may be concurrent. The ways in which education and work are combined can significantly affect the transition process. Of particular interest, for example, is the extent to which working while studying (beyond the usual summer jobs for students), may facilitate entry into the labour force. It is also important to consider whether students who work many hours while studying may be more likely to drop out of education, and to examine if working and studying simultaneously contributes to a successful transition to the labour market.

This chart shows the share of the 25-to-29-year-olds who are neither employed, nor in education, by level of educational attainment. The height of the bars indicates the percentage of the age group not in education and unemployed for each level of attainment. At the end of the transition period, between the ages of 25 and 29, when most young people have finished studying, differences in access to employment are linked to the education level attained. Not attaining an upper secondary qualification is clearly a serious handicap. Conversely, higher education offers a premium for most job seekers. In 16 OECD countries, for upper secondary graduates aged 25 to 29, the ratio of persons not in education and unemployed to the total youth population is above 5%. In a few OECD countries, even young people who have completed higher education studies are subject to considerable unemployment risk when they enter the labour market.

Share of the 25-to-29-year-olds who are unemployed and not in education, by level of educational attainment (2003)



Source: OECD, Education at a Glance 2005, Table C4.3.

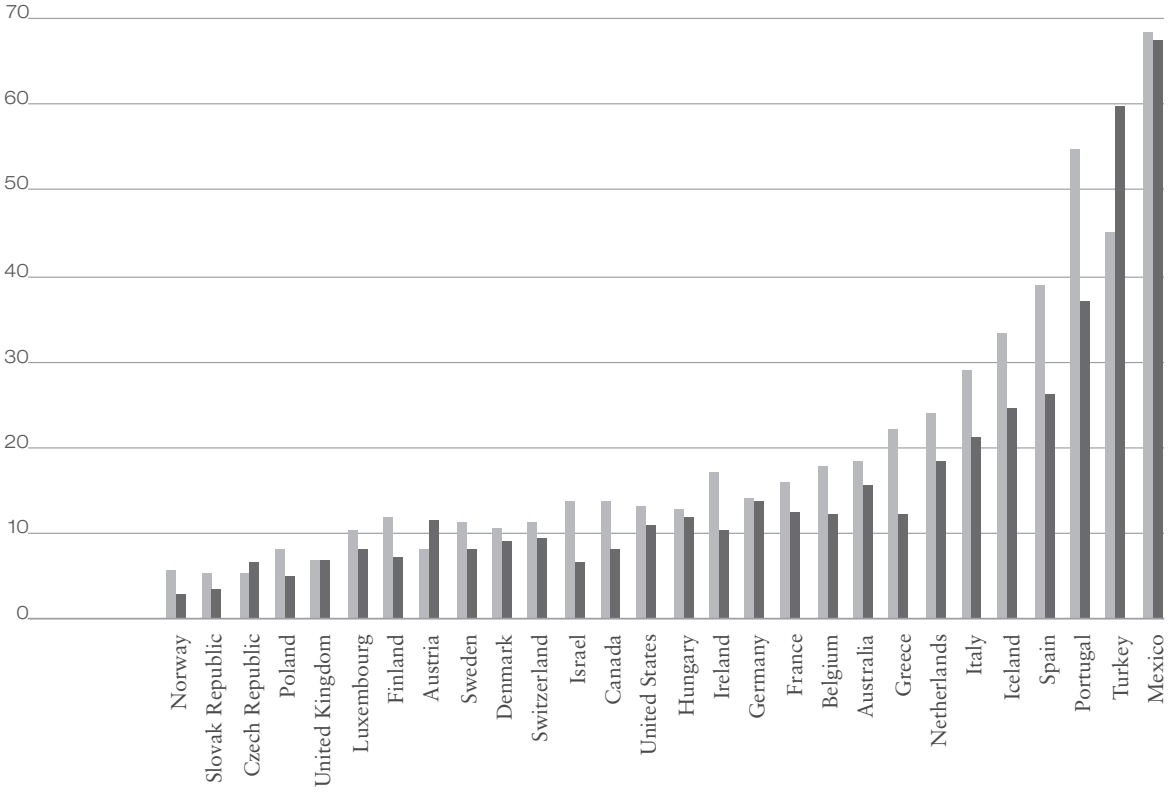
25 | Situation of the youth population with low levels of education (20-to-24-year-olds)

As the importance of education for economic success and general well-being grows, providing effective educational careers for young people and ensuring successful transitions from initial education to working life become major policy concerns. Rising skill demands in OECD countries have made upper secondary diplomas a minimum requirement for successful entry into the labour market and a basis for further participation in lifelong learning. Young people with lower qualifications run a higher risk of long-term unemployment or unstable or unfulfilling employment, which can have additional consequences, such as social exclusion.

This chart shows the share of 20-to-24-year olds – employed, unemployed or not in the labour force – who have not attained upper secondary education and who are no longer in education. Across 27 OECD countries, an average of 18% of 20-to-24-year-olds are without upper secondary education and not in education. In Austria, the Czech Republic, Norway, Poland, the Slovak Republic and the United Kingdom, the proportion of young people aged 20 to 24 no longer in education and without upper secondary education remains under 10%. The problem affects more males than females in 22 out of 27 countries, including Greece, Iceland, Ireland, Italy, Portugal and Spain. The reverse is true in Austria, Czech Republic and Turkey. Differences according to gender remain small in the other countries.

The situation of the youth population with low levels of education (2003)

Share of 20-to-24-year-olds who have not attained upper secondary education and who are no longer in education



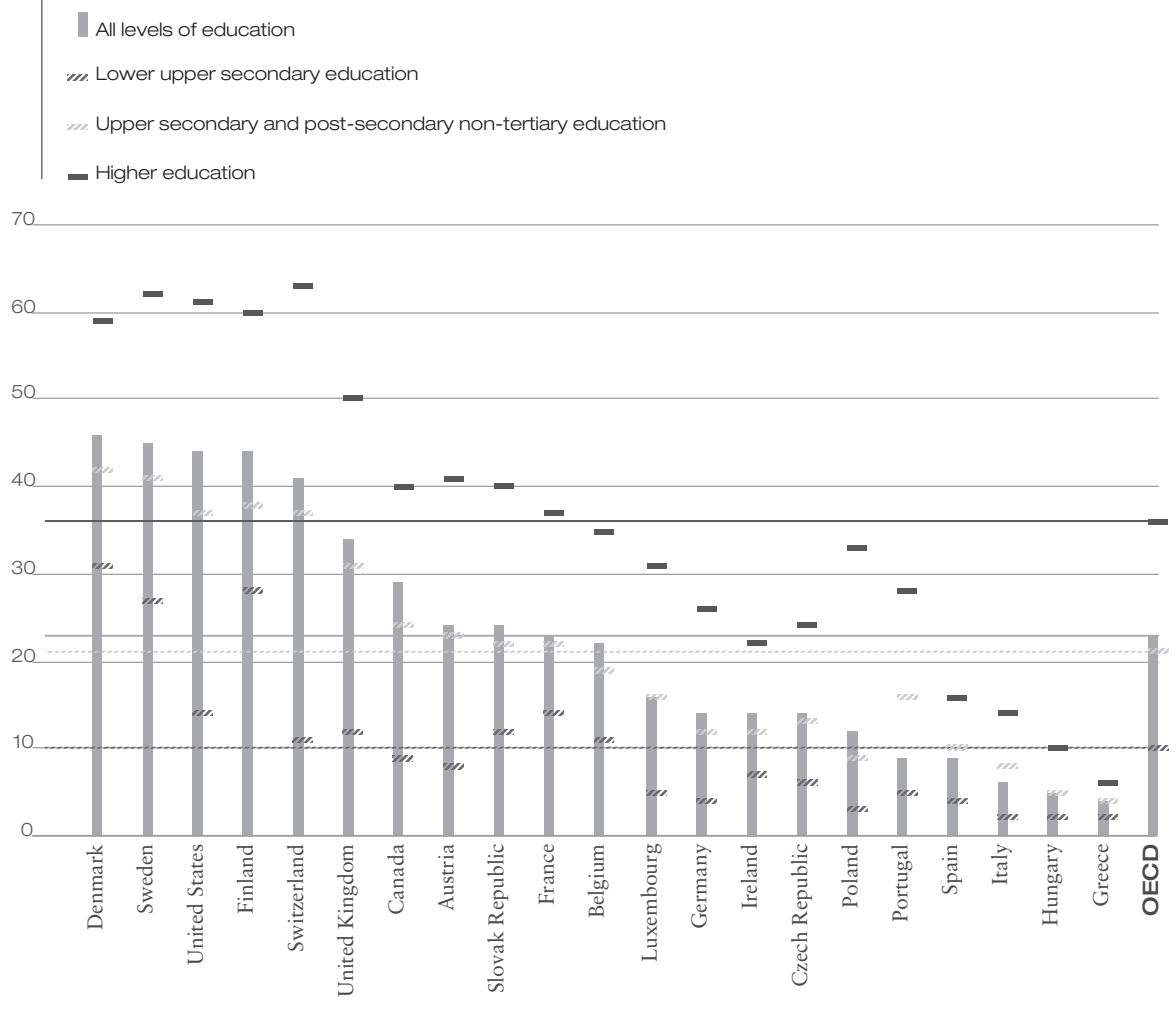
Source: OECD, Education at a Glance 2005, Table C5.1.

26 | Participation in continuing education and training (25-to-64-year-olds)

Participation in continuing education and training is increasing due to new and increasingly complex work tasks and because of job mobility. It is more common in large firms, the public sector and in sectors such as business services, banking or finance and is usually provided to full-time or more established workers in a firm. Though it is generally equally accessible to women as to men, such training is more prevalent for management and senior posts than for non-executive or unskilled jobs and occurs more often for young and mid-aged workers than for older workers. It is likely to increase in line with the level of initial qualifications: training leads to training.

Some of these characteristics refer directly to features of employment, while others relate more specifically to those of individuals. Despite these large variations in participation rates, the most striking and common feature is that adult education and training increases in line with the level of initial qualifications. Across the board, the participation rate varies considerably according to prior levels of educational attainments. In other words, all countries share inequalities in access to adult learning. On average for the OECD countries surveyed, participation in adult non-formal continuing education and training is almost 26 percentage points higher for individuals who have completed higher education than for persons who have only attained a lower upper secondary education. A greater understanding of the underlying causes of this participation differential by initial education could assist with strategies for promoting lifelong learning among the less qualified.

Participation rate in non-formal job-related continuing education and training for the labour force 25-to-64 years of age, by level of educational attainment (2003)



Source: OECD, Education at a Glance 2005, Table C6.2.

[Internationalisation of Higher Education

27 | Foreign students in higher education

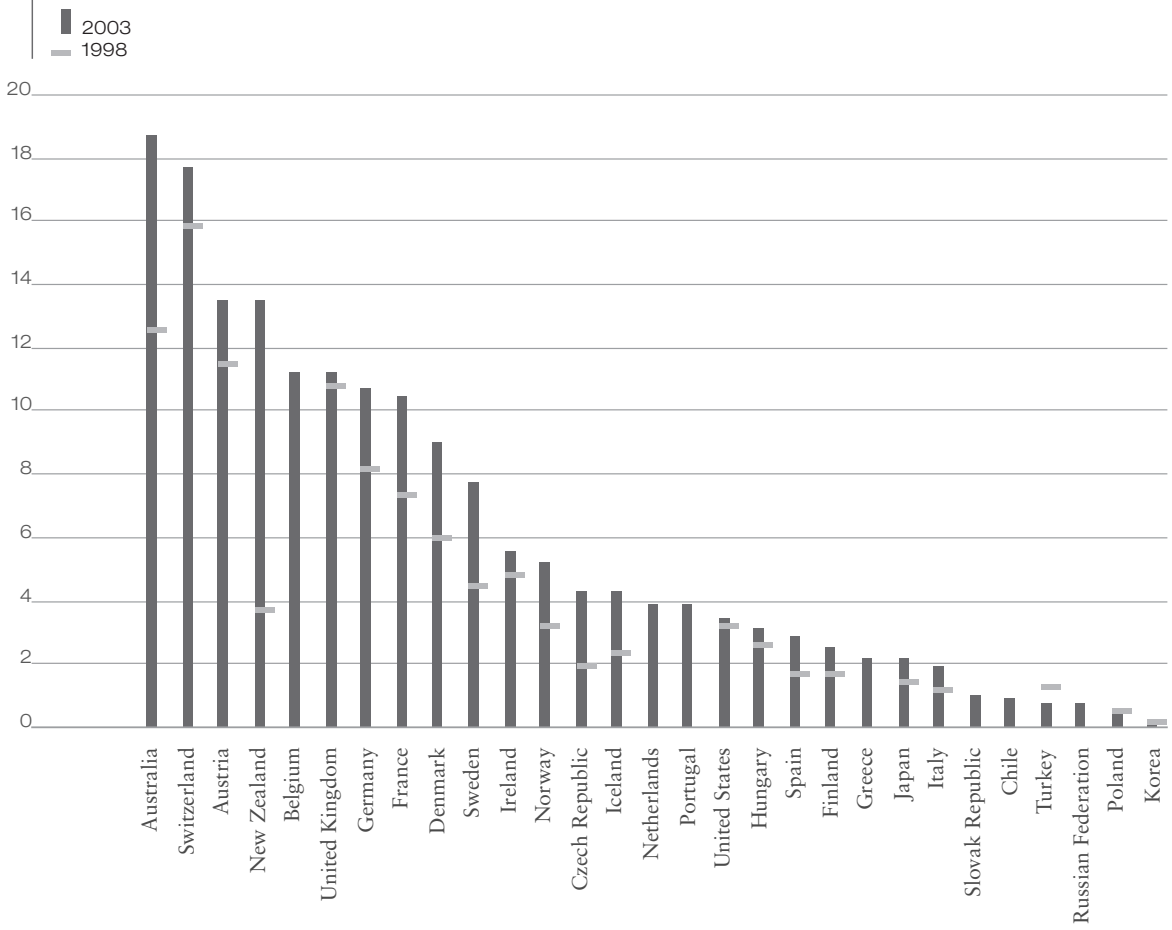
The general trend towards freely circulating capital, goods and services coupled with changes in the openness of labour markets has increased the demand for new kinds of educational provision in OECD countries. Governments as well as individuals are looking increasingly to higher education to play a role in broadening the horizons of students and allowing them to develop a deeper understanding of the multiplicity of languages, cultures and business methods in the world. One way for students to expand their knowledge of other societies and languages and hence to leverage their labour market prospects is to study in higher education institutions in countries other than their own. Indeed, several OECD governments have set up schemes and policies to promote such mobility, especially so in the EU.

In 2003, 2.12 million students were enrolled in higher education outside their country of origin, of which 1.98 million (or 93%) studied in the OECD area. According to available data, this represented an 11.5% increase in total foreign enrolments since the previous year – or 219 000 additional individuals in absolute numbers.

Overall the number of foreign students enrolled higher education in OECD and partner countries reporting data to the OECD increased by 31% in the first three years of the new millennium. Looking only at the OECD countries allows comparisons over a longer time span, and identification of trends over the past five years. Since 1998, the absolute number of foreign students reported in the OECD area has increased by nearly 50%, which amounts to an 8.3% annual increase on average.

Percentage of foreign students in higher education (1998, 2003)

Percentage of foreign students to total enrolment in higher education



Source: OECD, Education at a Glance 2005, Table C3.1.

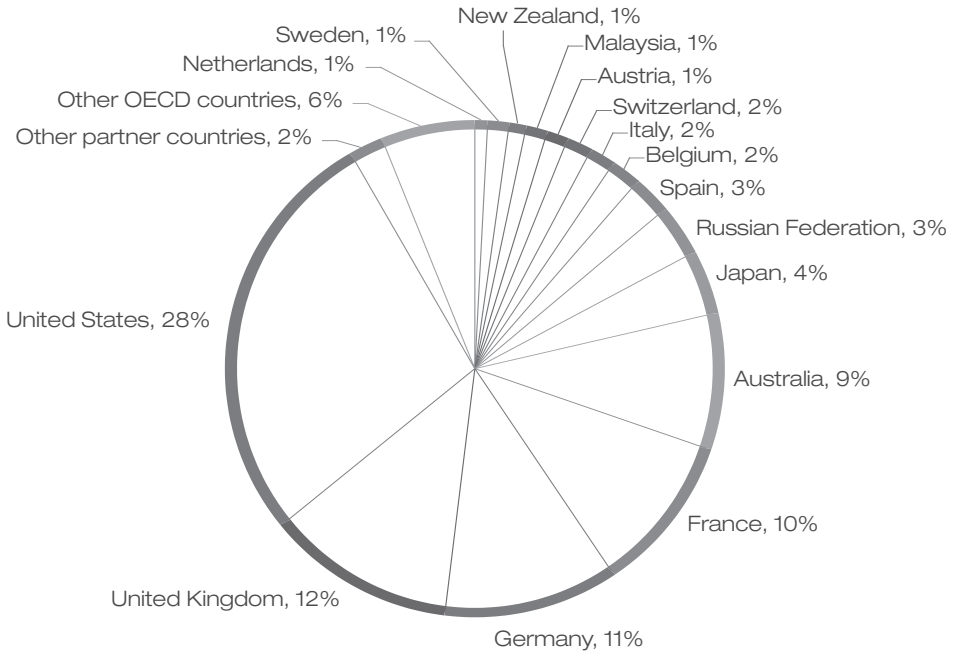
28 | Foreign students in higher education by country of destination

In 2003, as in previous years, seven out of ten foreign students are attracted to a relatively small number of destinations. Indeed, only five countries enrol the vast majority of foreign students studying in the OECD area and in other partner countries reporting such data. The United States receives the most foreign students (in absolute terms) with 28% of the total of all foreign students, followed by the United Kingdom (12%), Germany (11%), France (10%) and Australia (9%). Altogether, these five major destinations account for 70% of all students pursuing their studies in higher education institutions abroad.

Besides these five major destinations, significant numbers of foreign students are also attracted to Japan (4%), the Russian Federation (3%) and Spain (3%) to pursue their studies. Among other destinations, Malaysia is also playing an increasing role in international education, with rapidly growing numbers of foreign students, mainly from China, India and neighbouring Asian countries (including Oman).

Borderless education: Where international students go

Percentage of foreign students in higher education reported to the OECD who are enrolled in each country of destination



Source: OECD, Education at a Glance 2005, Table C3.7.

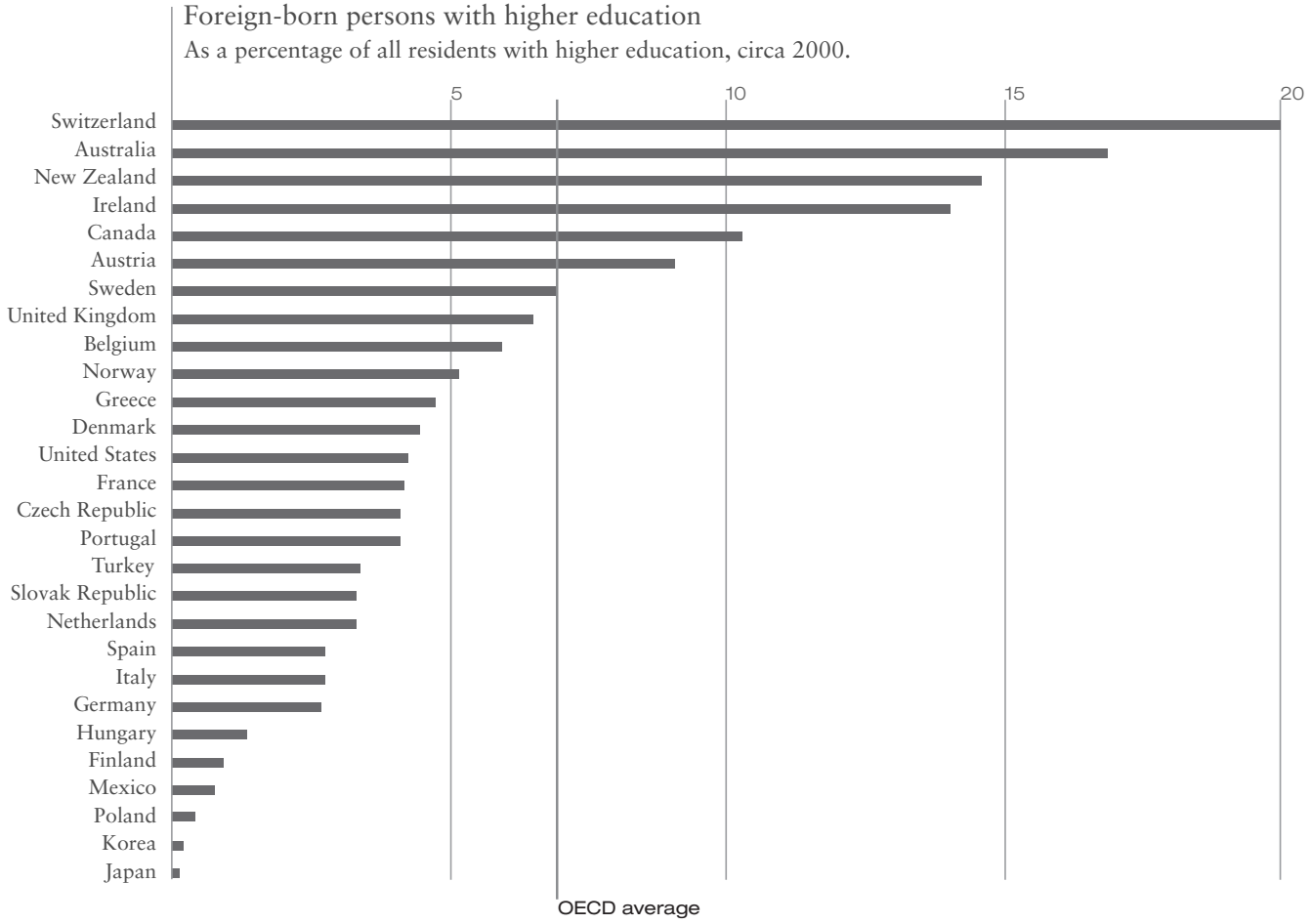
29 | Migration of the highly educated

The chart compares the number of foreign-born persons with higher education (ISCED levels 5A, 5B and 6) living in or from OECD countries as a percentage of the total number of similarly-qualified residents.

In the total OECD area, about 4% of persons with higher education are immigrants from other OECD countries. Those from non-OECD countries account for about 6% of all current residents with higher attainment. Many OECD countries "gain" more than they "lose" from migration of the highly educated. The proportions are highest in the traditional "settlement" countries of Australia, Canada and the United States, but also in Luxembourg and Switzerland. Other countries with a large excess include Sweden and France (8-9%).

On the other hand, countries having a large percentage of highly-educated former residents living in other OECD countries include Ireland and New Zealand (at close to 25%); Austria, Switzerland, the United Kingdom, Luxembourg, Poland, Portugal and the Slovak Republic (all at more than 10%); and the Czech Republic, Germany and the Netherlands (at close to 9%).

Several countries have close to zero net movements overall, essentially because they gain as many as they lose to within-OECD migration (Austria, United Kingdom, Italy, Netherlands, New Zealand) or they do not show many movements in general (Japan and Korea).



Source: OECD Factbook 2006: Economic, Environmental and Social Statistics.

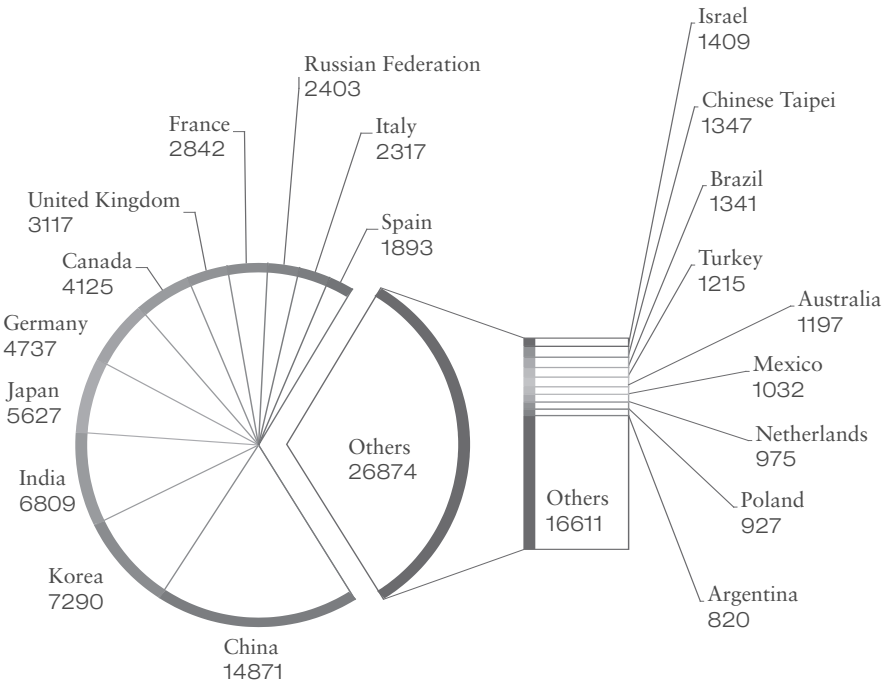
30 | Foreign scholars in the United States

The presence of foreign scholars in US higher education institutions is an indicator of the international attractiveness of the country's universities and of opportunities for researchers in the United States. In 2003/04, US higher education institutions hosted 82 900 foreign scholars to conduct teaching or research activities. Most of these scholars were engaged in research activities, although the share for whom teaching or non-research activities are the primary function has increased over the past decade. Two-thirds are in scientific or engineering fields, with a fast-growing proportion involved in life and biological sciences. Just 20 countries account for 80% of foreign scholars in the United States. Almost one in two was from a non-OECD country and a quarter came from the European Union. China was the first country of origin and Asia the most important region. Around 18% of non-US scholars were Chinese; around 8% were Korean or Indian and more than 6% Japanese. The four major European countries (Germany, France, United Kingdom and Italy) and Spain each provided between 2% and 6% of foreign academic staff. In addition, Canada and the Russian Federation accounted for 5% and almost 3% of the total, respectively.

Scholarly mobility compared to the size of the local academic population varies across countries. For most OECD countries, two to four scholars hold positions in US universities per 100 working at home. Academic mobility is most significant from Korea (13), Russian Federation (8) and Chinese Taipei (6). Expansion of the population of foreign scholars has been driven by a massive and sustained arrival of Asian academics. Although a large number of Asian academics already worked in US universities in the mid-1990s, the number of scholars from Korea, India and China has kept growing at average annual rates of 9%, 6% and 4%, respectively. Academic mobility from Turkey (7.7%) and the Russian Federation (6.6%) has also increased. However, mobility from European countries has slowed. The number of scholars originating from Finland, Hungary and Iceland decreased by more than 2.5% annually between 1995 and 2004. Although most foreign scholars are still men, women are more numerous than in the past; in 2003/04 female academics accounted for a third of total foreign scholars in the United States.

Foreign scholars in the United States

82 905 foreign scholars working
in the United States academia in 2003/04



Source: OECD, based on Institute of International Education (IIE), April 2005