Chapter 5

ENSURING THE SUPPLY OF HUMAN RESOURCES IN SCIENCE AND TECHNOLOGY

This chapter discusses the evolving policy context for HRST *and analyses recent trends in the demand for and supply of graduates in science and engineering.* It *reviews policy measures implemented by* OECD *governments to address the challenges raised by these trends and discusses the outlook for human resources in science and technology.* As *the chapter shows, concerns about supplies of* HRST *are widespread across the* OECD *area, though often for different reasons.* Countries *are taking a number of innovative steps to increase interest in science and technology studies, to make scientific and engineering careers more attractive, and to benefit from international mobility of science and technology workers.*

Introduction

Human resources are at the core of the scientific research enterprise as well as social and technological innovation. Men and women trained in science and technology help firms to innovate and make it possible for universities and public research institutions to carry out their education and research missions. Governments and higher education institutions therefore have several objectives with regard to the development of human resources in science and technology (HRST). They must ensure a sufficient supply of scientists and researchers to work in industry and in the public sector. They must also ensure that education and training curricula are relevant and able to adapt to the emergence of new scientific disciplines and industries (*e.g.* nanotechnology). In addition, because transfers of knowledge and technology take place mainly through people, governments must ensure that regulatory frameworks and markets foster the mobility of researchers between the public and private research sectors as well as within and between geographic regions.

Recent developments have raised concerns about the future supply of HRST and the ability to meet anticipated demand. Demand for science and engineering graduates is growing as OECD countries move to more knowledge-based economies and as an accelerating number of researchers approach retirement age, notably in the public research sector. While numbers of science and engineering graduates continue to grow, their share among all graduates has expanded slowly or declined in a number of countries, and enrolments have dropped at the first levels of tertiary education. Access to foreign students and researchers has become an important way to meet demand and stimulate the diffusion of knowledge in many OECD countries, but the international mobility of students and scientists raises its own challenges.

This chapter discusses the evolving policy context for HRST and analyses recent trends in the demand for and supply of graduates in science and engineering.[1] It then reviews policy measures implemented by OECD governments to address the challenges raised by these trends and discusses the outlook for human resources in science and technology. As the chapter shows, concerns about supplies of HRST are widespread across the OECD area, though often for different reasons. Countries are taking a number of innovative steps to increase interest in science and technology studies, to make scientific and engineering careers more attractive, and to benefit from international mobility of science and technology workers.

Growing demand for science and technology workers

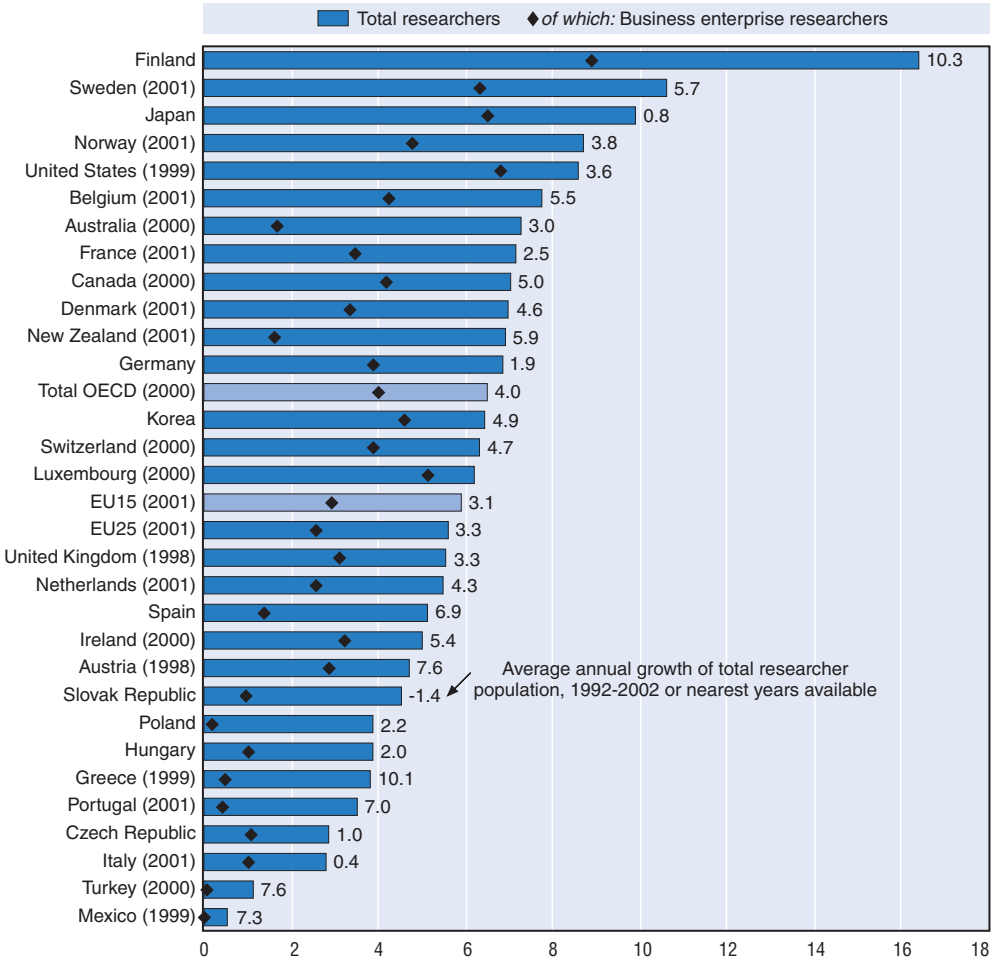
As business and governments investments more in research and development (R&D), demand for public and business researchers in areas such as information technology (IT) and biotechnology continues to expand. According to occupational data or labour force data, people educated in science and technology and/or working in occupations that typically require such qualifications represent some 20% to 35% of the labour force in OECD countries. Employment in these occupations has grown much more quickly than for the labour force as a whole in almost all OECD countries. Growth rates exceeded 3% a year between 1995 and 2000 in roughly half of OECD countries for which data are available, compared to roughly 1.5% for all employment.

1. In this chapter OECD data on science and engineering graduates and enrolments refer to the following fields of study according to the 1997 International Standard Classification of Education (ISCED): *a*) science includes life sciences (42), physical sciences (44), mathematics and statistics (46), and computing (48); *b*) engineering includes: engineering and engineering trades (52), manufacturing and processing (54) and architecture and building (58).

Of particular interest in debates about HRST are researchers – professionals engaged in the conception and creation of new knowledge, products, processes, methods and systems and directly involved in the management of projects. Growth in the researcher population has been rapid over the past decade. Between 1992 and 2000, the number of researchers in OECD countries rose from 2.5 million to 3.4 million, a 37% increase, or 3.6% a year. On average, researchers accounted for 6.5 of every 1 000 employees in the OECD workforce in 2000, up from 5.7 in 1992 (Figure 5.1). In Finland, the number of researchers per thousand employees more than doubled, from approximately 6.7 in 1991 to 16.4 in 2002, driven by the expansion of its high-technology sectors.

The business sector accounts for most of the research workforce and most of its growth. About two-thirds of all researchers in OECD countries are employed by the business sector, but the share varies considerably across the main regions and countries: in the United States, business absorbs four out of five researchers; in Japan and Korea between two-thirds and three-quarters of all researchers work in the business sector. In the European Union and Australia, however, fewer than half of all researchers work in the business sector, reflecting a lower level of business investment in R&D and, consequently, more limited job opportunities for scientists and engineers. Growing business demand for researchers accounted for more than 60% of the total growth in the research population in the last decade.

Figure 5.1. **Researchers per thousand in total employment, 2002**



Source: OECD MSTI Database, 2004.

Between 1992 and 2000, the number of business researchers grew by 39%, from 1.6 million to 2.2 million. Growth was strongest in the United States, which saw average annual increases of 3.3%, compared to 2.8% in the EU15 and 1.9% in Japan.

Business sector demand for researchers is changing, as competition, globalisation and shorter product life cycles alter the focus of business R&D labs. Firms are increasingly adopting a more networked, open model of innovation that relies on partnerships and alliances as well as the acquisition of needed technology from a variety of sources, including public research institutions and new technology-based firms. Innovation in the service sector (*e.g.* banking, financial and business services) has also increased demand for graduates with science and technology backgrounds, creating a broader palette of opportunities for science and technology graduates outside their traditional employers, such as academia and manufacturing firms. Globalisation of R&D is altering patterns of demand for researchers, whether or not it results in the actual movement of research jobs to foreign countries (Box 5.1). Such changes are exerting pressure on higher education systems to produce science and

Box 5.1. Globalisation of R&D and outsourcing of science and technology employment

The international outsourcing of highly skilled jobs is an issue that has moved to centre stage in many OECD countries. Governments, however, lack official data on the phenomenon. According to Forrester Research, US firms increased the number of software programming jobs created overseas from 27 000 in 2000 to 80 000 in 2003. Forrester Research estimates that by 2015, some 3.3 million service industry jobs, including IT-related jobs, will have been outsourced from the United States to other countries, mainly India, China and Southeast Asia. While this represents the potential loss of 250 000 high-skilled jobs a year, the number is small compared to total US employment of 137 million (Brainard and Litan, 2004).

Although policy attention focuses on the outsourcing of IT-related jobs, there are growing concerns that R&D-related jobs will also be outsourced as OECD-based firms continue to expand their foreign R&D operations. Traditionally, it has been assumed that the R&D activities of firms were of such strategic value that outsourcing them for cost reasons was too risky, notably in comparison to the outsourcing of manufacturing or back-office activities (*e.g.* call centres). Now, heightened competition, the development of global research networks, availability of highly skilled staff overseas and access to new markets as well as greater protection of intellectual property rights overseas are all making the globalisation of R&D activities not only less risky but a necessary part of firms' strategies.

OECD data show that, on average, R&D performed abroad by foreign affiliates represents 12% of total expenditure on industrial R&D in the OECD area. Outflows of R&D to developing countries are on the rise, especially to China and India. US foreign affiliates in China performed USD 506 million worth of R&D compared to only USD 7 million in 1994 (OECD, Activities of Foreign Affiliates database). The number of jobs involved in such affiliates is difficult to estimate. Motorola's China R&D Institute, for example, links 19 separate R&D centres, employing some 1 600 R&D engineers. IBM's China Research Laboratory has over 100 technical staff as does Intel's China Software Lab in Shanghai. Bell Labs Research China employs just 23 staff members. The United States is not the only OECD country concerned by the outsourcing of R&D and related jobs. The UK and continental European countries such as Germany also report a rise in outsourcing activities to neighbouring countries in Central and Eastern Europe, Russia and China. Meanwhile, Japanese and Korean firms continue to expand their research and business activities in China and Southeast Asia, even if North America remains a key destination for R&D-related FDI.

Economic theory suggests that outsourcing offers net economic gains as firms raise their productivity and invest the cost savings into R&D which leads to the development of new products and services and creates more high-skilled jobs, raising income levels. Yet it also warns that there may be dislocation effects as unsuccessful firms and their workers are displaced. The policy challenge in many countries is to ensure a level playing field in global trade in services while addressing the short-term costs through adjustment measures such as retraining benefits for displaced workers. Improving the attractiveness of a country for cutting-edge research and innovation, including by encouraging skilled workers to invest in lifelong learning and by fostering entrepreneurship, will, however, go a long way towards helping countries benefit from the globalisation of R&D and outsourcing.

engineering graduates with interdisciplinary skills as well as with a range of teamwork, managerial and entrepreneurial skills.

Although business accounts for most of the demand for researchers, public-sector demand has also grown quickly, largely owing to the higher education sector. OECD-wide, the number of public-sector researchers increased by more than 20% between 1991 and 2000. In the United States, the number of researchers in the higher education sector grew by 35% between 1991 and 1999, while the number of government researchers dropped by 18%. The European Union saw the higher education research population rise by 30% overall during the 1990s, while the government sector expanded by 8%. In Japan the number of higher education researchers also grew by approximately 20% during the decade, while the number of government researchers remained relatively flat. Thus, while business is driving new demand for researchers, parallel investments in higher education R&D by governments, business and even private foundations are stimulating demand for researchers in universities.

The characteristics of public sector research employment, too, are changing. Although employment has continued to expand in a large number of OECD countries, in countries such as Japan, Italy, the United Kingdom and the United States much of this growth has been due to the rise of temporary employment positions, including post-doctorates. The shift in public research funding towards a more complex funding system involving competitive and project-based funding as well as funding from business exerts more pressure on public research institutions to be more flexible and able to respond to changes in research funding and priorities and thus affects employment arrangements.

Demand for researchers and science and technology workers more broadly is expected to grow – the EU estimates it will need 700 000 new researchers to meet its commitment to increase investment in R&D to 3% of GDP by 2010. Other OECD countries that have established R&D spending targets are equally concerned about shortfalls in the supply of graduates (Table 5.1). Demand for science

Table 5.1. **National goals for human resources in science and technology**

Country/region	Human resource goals
European Union	An estimated 700 000 additional researchers will required to meet the objective of raising R&D spending to 3% of GDP by 2010.
France	Increase the number of researchers in the business sector. In 2004, an additional 300 CIFRE (Conventions Industrielles de Formation par la Recherche) scholarships for PhD training in an industrial setting will be funded.
Germany	Increase the share of German students having studied abroad from 14% to 20%, and increase the share of foreign students from 8.5% to 10% by 2010.
Ireland	Double the proportion of researchers in the population from 5:1 000 to 10:1 000.
Canada	An estimated 100 000 additional researchers will required to achieve the objective of raising R&D intensity to the top five in the OECD. The government aims to increase Master's and PhD students at Canadian universities by an average 5% a year to 2010. Up to 4 000 new qualified graduate students will funded through the Canada Graduate Scholarships Programme. In 2003, new funding was allocated to improve the Student Loan Programme.
Japan	Policy recommendation by the University Council in 1997 stated that graduate enrolment should be expanded from 150 000 in 1997 to 250 000 in 2010 to meet new demand.
Korea	Increase the number of researchers from 180 000 to 250 000.
Netherlands	The Ministries of Education, Culture and Science, of Economic Affairs and of Social Welfare and Employment have established the "Delta Plan for Science and Technology" among other actions to increase the number of knowledge workers with a scientific or engineering background. The plan includes initiatives in the areas of science education, communication about science and technology, women and minorities in science and the immigration of knowledge workers. Annual investments will increase to EUR 60 million by 2007 to carry out the policy measures.
Norway	Increase PhD degrees awarded from 700 to 1 100 degrees a year (total for all disciplines) by 2010.
Switzerland	Double the number of assistant female professors at Swiss universities by 2006 to 14% of faculty.
United States	Fill all primary and secondary schools with teachers who are trained in mathematics and science by 2005 (as stipulated by the "No Child Left Behind" Law).

Source: OECD STI Outlook 2004 Questionnaire; European Commission (2003) DG-Research Communication on the 3% Target.

graduates in Japan, in particular, is expected to increase as the government plans to boost funding for basic research. Japan's University Council predicted in 1998 that demand for Master's students would exceed supply by 2010 (Yamamoto, 2003). Ireland, whose stock of skilled labour has been key to attracting R&D-related foreign direct investment (FDI), is predicting shortages of engineering, biomedical and chemical graduates as early as 2005 (Forfás, 2003). The US National Science Foundation (NSF) projects that some 2.2 million new jobs in science and engineering will be created over 2000-10, especially in computer-related occupations, and that employment in science and engineering will increase three times faster than the overall rate of employment. Furthermore, the US National Academies estimate that the number of people working in the biotechnology industry will rise from around 200 000 to over 1 million by 2015 (NAS, 2001).

Demand will be augmented by demographic changes, in particular the ageing of the science and engineering workforce. Countries such as Australia and Italy worry about replacing the large numbers of "baby boomer" faculty that will retire in the coming years. Some 70% of full professors and 35% of all science staff at Italian universities are over 50 years old. A recent Dutch study found that by 2008, holding 1998 demand constant and based on retirement rates and current enrolment trends, some 12% of research positions in universities and public research organisations would go unfilled because of shortages (Van Dijk and Webbink, 2000).

Will supply meet demand?

Meeting the demand for scientific talent is high on the agenda of all OECD governments, and concerns about falling enrolments and waning interest in science among young people dominate the discussion in many countries. In the United Kingdom, a recent government report bemoaned a 16% drop in enrolments in chemistry and a 7% drop in enrolments in physics and engineering between 1995 and 2000 (HM Treasury, 2002). The US National Science Board recently sounded the alarm over US dependence on foreign graduate students and falling enrolments in science and engineering among US-born students (National Science Board, 2004a). Such concerns are not new. Already in 1945, Vannevar Bush, the Director of the US Office of Scientific Research and Development, warned that "with mounting demands for scientists both for teaching and for research, [America] will enter the post-war period with a serious deficit in our trained scientific personnel". The launching of Sputnik in 1957 and the space race between the Soviet Union and the United States amplified these concerns and led to the expansion in the supply of scientists and engineers, not only in these two countries but also in Western Europe and Japan. Concerns about shortages of scientists and engineers resurfaced many times in the ensuing decades.

There are several interpretations of the term "shortage". The first, in standard economic theory, is defined as occurring when demand for labour exceeds the supply of labour available at a given wage. The second type of shortage could be defined as a shrinking of national supply, that is that the number of new science and technology graduates falls and is insufficient to replace those exiting the workforce (*e.g.* as a result of retirement, emigration or death). Another type of shortage could be defined as resulting from lower than expected production to meet an expected or desired level of demand (Butz *et al.*, 2003). However, most labour economists debunk claims of future shortages of scientists, pointing out that the market will resolve them, as an increase in demand will result in a rise in wages for fewer scientists and this, in turn, will increase incentives for more students to pursue scientific subjects and so raise supply again. This logic may apply less to academic positions, where public universities or governments are the main employers and where public R&D spending is the main determinant of demand. Here, salaries may not adjust easily to a drop in supply or to competition from other sectors such as IT.

Shortages should lead to a drop in the unemployment rate for scientists. Unemployment rates for recent university graduates have historically been low across OECD countries and ranged between 2% and 5% in 2000. In the United States, the unemployment rate of PhDs in science and engineering during the recent economic boom was even lower, at 1.2% for graduates who had been out of school for three years, according to the US National Science Foundation. But these overall figures do not show where particular types of scientist are working. In fact, the NSF found that some 4.2% of science and

engineering PhDs were working outside their field of training, chiefly for financial reasons, a change in professional interests or lack of opportunities in their field. In other words, while few scientists are out of work, a proportion do not find jobs in occupations that are closely related to their studies. This would weaken the claim of a widespread shortage of science and engineering graduates, but may signal another problem: mismatches between supply and demand.

Perhaps the central issue behind concerns about shortages of scientists in OECD countries is the realisation that the growth of OECD economies depends on investments in knowledge, including an ample supply of scientists and engineers, allied with a perception that young people are either less interested in science than before and/or less academically equipped to pursue research careers. Data on graduates and enrolments are one way to assess whether young people are less interested in science than before and whether there is a risk of shortages of graduates on the horizon.

Production of science and engineering graduates is expanding, but slowly

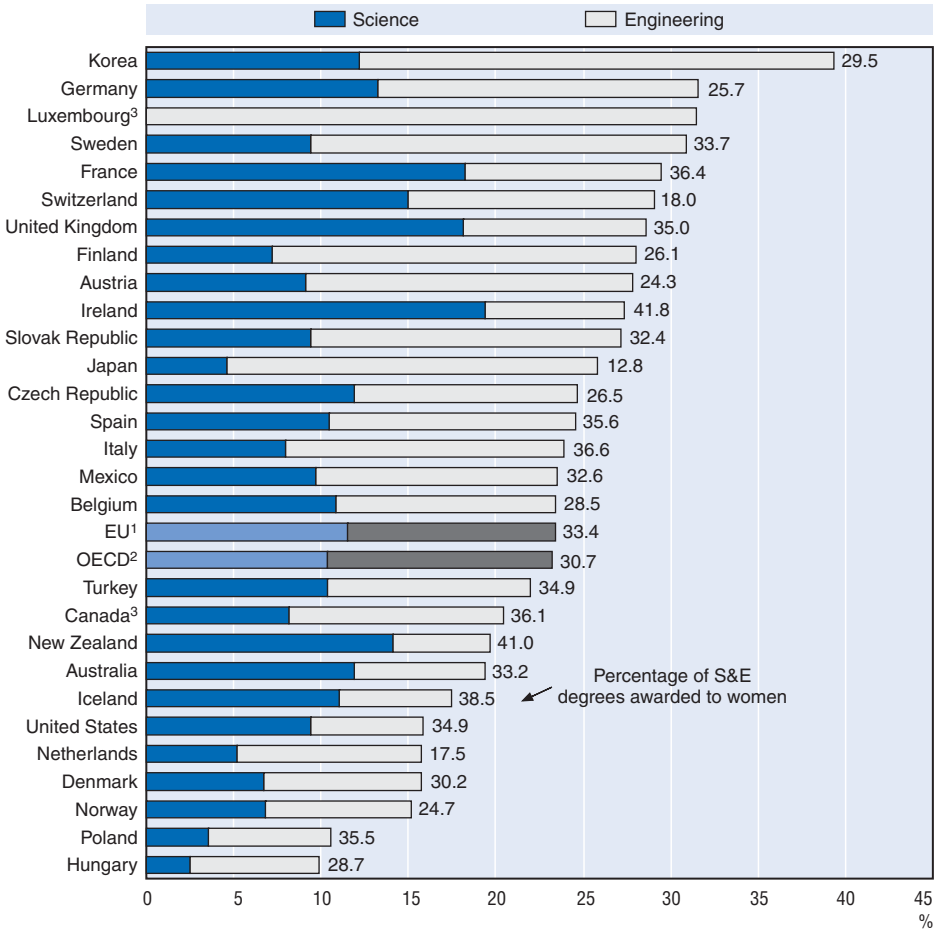
Over the past two decades the massive expansion of post-secondary education across OECD has led to large numbers of young people with degrees from tertiary education institutions. Public and private expenditures on tertiary education account for 5.9% of GDP in the OECD area and have been rising, but vary widely among countries, from 7% of GDP in the United States and 7.1% in Korea compared to 6.4% of GDP in Sweden and 4.6% of GDP in Japan in 2000/2001 (OECD, 2003b). Meanwhile, higher education has also become more internationalised, with institutions actively recruiting foreign students, establishing campuses overseas and creating joint degree programmes with foreign universities. Private and non-traditional educational institutions have also increased their role as purveyors of higher education, especially in areas like information technologies, language and business skills.

The share of tertiary graduates with degrees in science and engineering fields have declined marginally in recent years. In 2001, more than one-fifth of tertiary graduates in OECD countries were granted in science and engineering fields, but the proportion varies widely. In Japan, for example, 25.8% of all university degrees were granted in science and engineering in 2001; the figure for the EU25 is slightly lower, at about 23.6% (Figure 5.2). In the United States, by comparison, only 16.2% of university degrees were in science and engineering. These figures represent slight drops relative to 1998 even if the actual numbers of science graduates has increased. In 1998, the shares of science and engineering graduates were 26.0% in Japan, 24.7% in the EU25, and 16.2% in the United States. Across the OECD, the share declined from 22% to 21.8%.

Nevertheless, the total numbers of science and engineering graduates (at all levels of university education) increased between 1998 and 2001, at an average annual rate of 3.2% in the EU, 2.3% in Canada, 1.8% in Japan, and 1.5% in the United States. However, significant differences exist between science graduates and engineering graduates. The number of science graduates expanded significantly in the United States, the United Kingdom and in France, while remaining relatively flat in Japan and Canada and falling in Germany and Italy (Figure 5.3a). The number of engineering graduates, in contrast, fell slightly in France, Germany, United Kingdom and United States, but grew in Italy, Japan and, to a lesser extent, Canada (Figure 5.3b). It is worth recalling that the distribution of science and engineering graduates is heavily influenced by a country's pattern of economic development and technological specialisation. Countries such as Korea, Japan, Germany and Sweden produce a very large number of engineering graduates in comparison to science graduates. Southern European countries, with the exception of France, also produce more engineering graduates than science graduates. The United States has a more balanced production of engineering and science graduates, reflecting its highly diversified technological base and its strong science base.

The supply of PhD graduates is of particular interest insofar as most university teaching and research faculty positions – as well as a significant number of research jobs in science-based industries – require PhD level training. Within the OECD area, EU countries produce more PhDs as a share of the population (186 per million) than the United States (159 per million) and Japan (96 per million). In terms of the absolute number of PhDs in science and engineering, the EU (30 189) outranks the United States (16 287). Within the EU, Sweden, Germany, France, United Kingdom and Finland produced more science and engineering PhDs as a share of total university graduates in 2000 than other EU countries (Figure 5.4).

Figure 5.2. **Science and engineering degrees as percentage of new degrees, 2001**



1. 15 European countries before the 1st May 2004 to the exception of Luxembourg, Greece and Portugal, and four new members (Czech Republic, Hungary, Poland and Slovak Republic).
2. Average of the available countries.
3. 2000 instead of 2001.

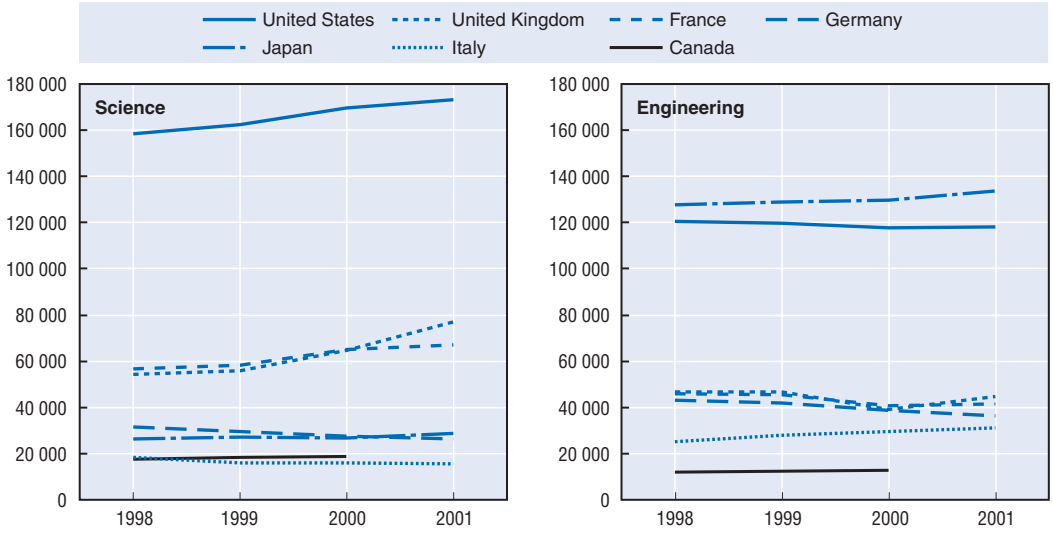
Source: OECD, Education database, July 2004.

Trends in PhD production vary considerably across OECD countries. Between 1998 and 2001, the number of science and engineering PhDs rose in Germany, Japan, Korea, but was stable in Austria, Australia and Canada. The number of doctorates in the physical sciences fell in Germany but increased in the United Kingdom and France, while the number of PhDs in the life sciences rose in Germany and the United Kingdom but fell in France. In the United States, there has been a slight rise in the number of science and engineering PhD graduates (4% in 2001), but a breakdown by academic field reveals significant variation. The number of PhDs in the physical sciences stagnated or fell during the 1990s, while it increased substantially in the natural and biological sciences, as well as in engineering. The current increase in public funding for R&D in the United States, especially in the higher education sector, could further accelerate the rise in the overall number of science and engineering PhDs graduates observed in 2001.

Data on university enrolments show similar patterns. In 2002 the share of students enrolled in university science and engineering programmes ranged from 20% to 30% on average (Figure 5.5a). Between 1998 and 2002, the majority of OECD countries for which harmonised data are available

Figure 5.3. **Number of science and engineering graduates in G7 countries, 1998-2001**

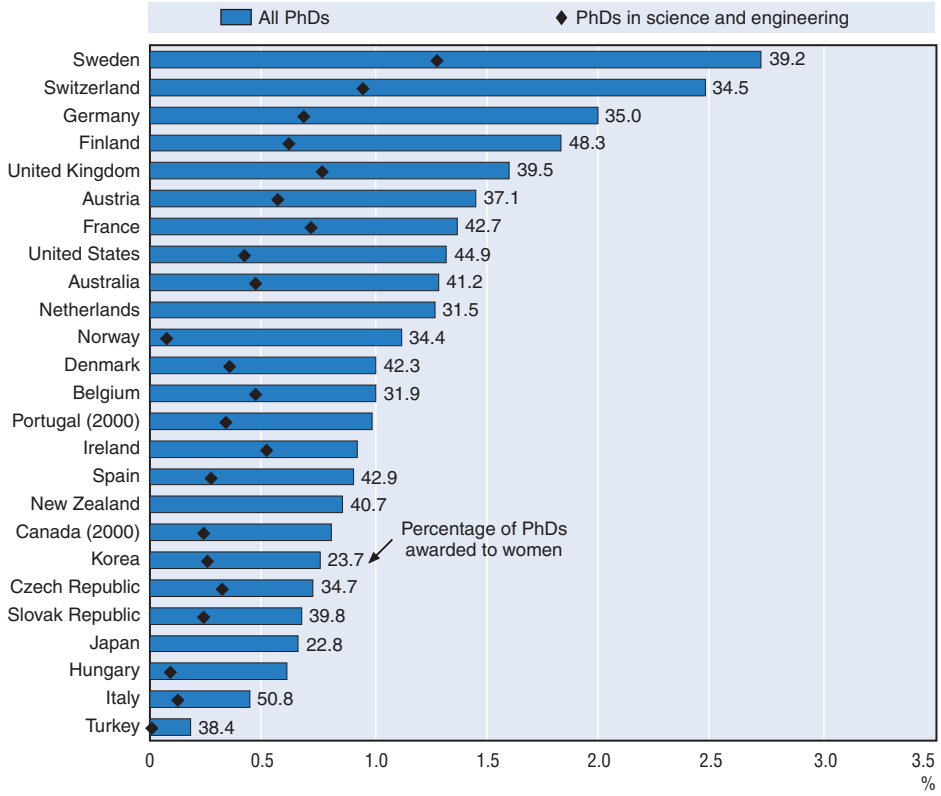
5.3*a*. Number of science graduates, 1998-2001 5.3*b*. Number of engineering graduates, 1998-2001



Note: Data concern science and engineering graduates at all post-secondary education levels (*i.e.* ISCED levels 5 and 6).
Source: OECD Education database, July 2004.

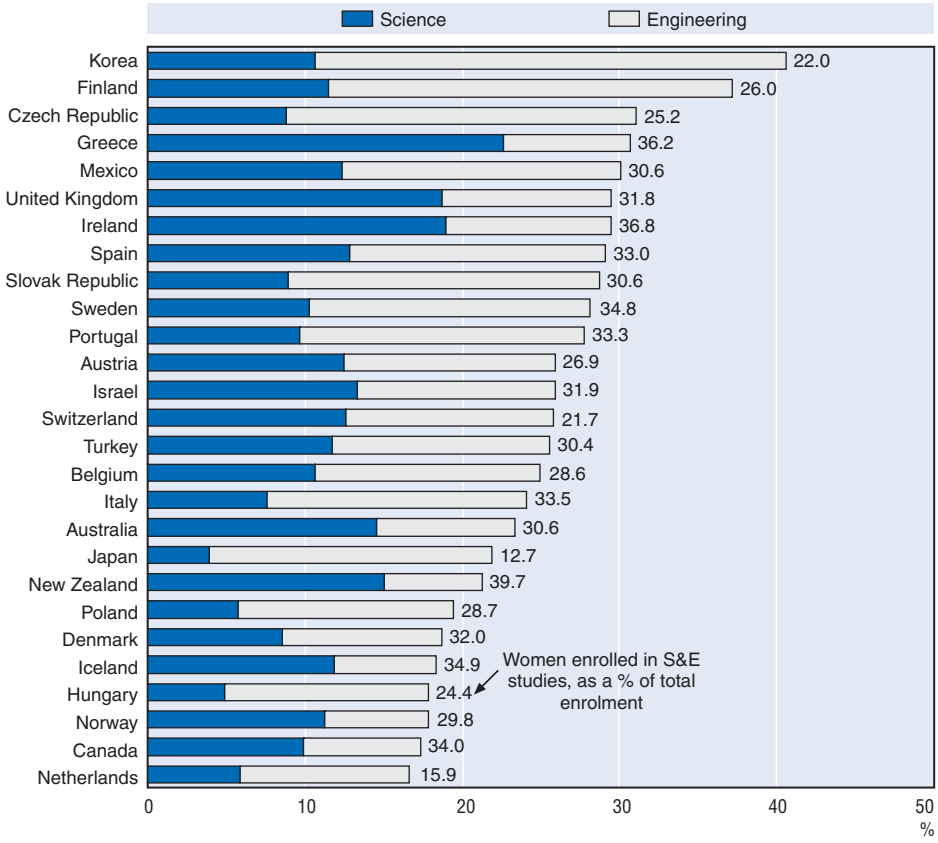
Figure 5.4. **Graduate rates at PhD levels, 2001**

PhD-level graduates as a share of the population at the typical age of graduation



Source: OECD Education database, 2004.

Figure 5.5. **Tertiary enrolment in science and engineering fields**
5.5*a*. Enrolment in science an engineering as a % of total enrolment, 2002



Source: OECD Education database, 2004.

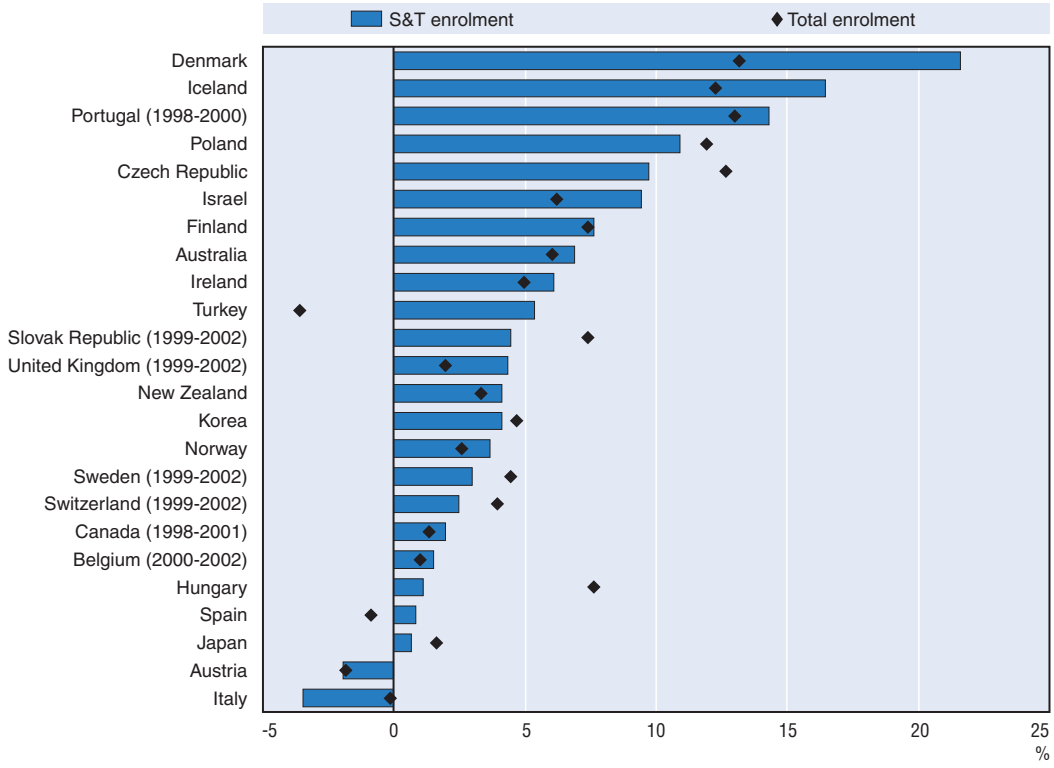
showed faster growth in science and technology enrolments than in overall enrolments (Figure 5.5b). This was not the case in Japan, Italy or many eastern European countries (Czech Republic, Hungary, Poland, Slovak Republic) that are in the midst of shifting to more R&D-intensive market economies. These data suggest that future supplies of scientists and engineers may increase, but great caution must be used in inferring graduation rates from enrolment data (Box 5.2).

Differences persist by field and level of study

National data show stark differences in the production of scientists and engineers by level of tertiary education and across scientific fields. In France, for example, national data show that between 1999 and 2001, the number of science graduates fell by 8.5% at the first degree level (*licence*) and by 5% at the second degree level (*maîtrise*). In contrast, the number of graduates of advanced research programmes (*Diplôme d'Études Approfondies* and *Doctorat*) increased slightly. A recent European Commission report on student enrolment in science and engineering programmes found that trends in enrolment in science and engineering vary sharply by individual field and level of study in France, Germany and the United Kingdom (European Commission, 2004):

- In *France*, the number of new entrants into the first-level university programmes fell by 5% in the physical sciences and by 10% in the life sciences between 2001 and 2003. The number of students enrolled in second-level programmes fell by 10% in the physical sciences and by 2% in the life

Figure 5.5. **Tertiary enrolment in science and engineering fields** *(cont.)*
5.5*b*. Average annual growth rate of new students, 1998-2002 (%)



Source: OECD Education database, 2004.

sciences, but rose by 12% in engineering programmes. At the PhD level, enrolments increased by 8% in physical sciences and by 38% in life sciences and by 19% in engineering.

- In *Germany*, enrolments in physics and chemistry fell at all levels between 1993 and 2002, but an improvement was observed for physics graduates.
- In the *United Kingdom*, the overall student population grew by 18.8% between the 1996/97 academic year and 2001/02 academic year, but without major increases in science and engineering enrolments. Enrolments in chemistry and physics fell from 4.2% of all students enrolled in 1996/97 to 3.2% in 2001/02. The number of students enrolled in the life sciences increased by 15.7%, while the number enrolled in the physical sciences fell by 10.2%. At the same time, enrolments increased by 61% in computer science but were more or less stable in mathematics and engineering.

The data on enrolment for these three countries show that there has been a slight decrease in enrolment at lower levels of tertiary education and in some fields of science. In contrast, enrolments in engineering programmes and in graduate level science and engineering programmes have continued to increase. Thus, while the supply of science graduates at all levels has increased, a decline in the number of science graduates at lower levels of tertiary education suggests that the pool of PhD students may become smaller in the future. However, this may not be the case if the fall is compensated by a rise in enrolment of foreign graduate students. Furthermore, part of the observed declines in enrolment may be related to attrition rates, as students who drop out of tertiary education do so in the early stages. In general, the contrast between a drop in enrolments at lower levels of tertiary education and a

Box 5.2. Interpreting enrolment data

Interpreting trends in enrolments and their underlying causes must be done with great care. Historically, data on enrolments and graduates show that supply follows changes in demand, albeit with a lag. Nevertheless, there is not a direct relationship between undergraduate and graduate enrolments, or between them and graduate rates. In some OECD countries, enrolment in a given field of study, notably at the lower levels of tertiary education, is only partly correlated with the field of study at the time of graduation. In some countries, it is relatively commonplace to change field of study in the first years of tertiary study. In others, where selection into tertiary education is highly competitive and the curriculum rigid it is more likely that a student who enrols in a mathematics, science or engineering programme will receive a degree in the same or related field. This is especially true at higher levels of tertiary education, such as the PhD level, where accumulated investment in a specialised field increases switching costs.

It is important to recall that the different levels of tertiary education have different missions and reflect a division of labour. In general, universities and vocational schools aim to provide the largest number of well-trained students for the local and national labour market. Graduate schools, in contrast, tend to produce advanced graduates in a variety of fields, including future teachers and professors. Graduate schools also recruit from a larger pool of candidates both nationally and internationally. Indeed, some graduate programmes compete at international level for the best students. Funding systems and incentives for undergraduate and graduate study also differ, and this has an impact on enrolments at different levels of tertiary education.

Students enrolled in tertiary education programmes may drop out (attrition) or take temporary leave, further diminishing the predictive value of enrolment data. Demographic trends influence the trends in enrolments, but the effects may be countered by public policies and labour market conditions. For example, in some countries where the total youth population has fallen, such as Norway, enrolments in tertiary education have nevertheless increased, in large part owing to greater participation by women. Most importantly, business cycles and the job market for graduates exert a strong influence on the level and field of enrolment, especially at the initial tertiary level, although with a time lag. This means that in the short term, it is possible to observe a drop in enrolments at one level of tertiary education and a continued increase at another.

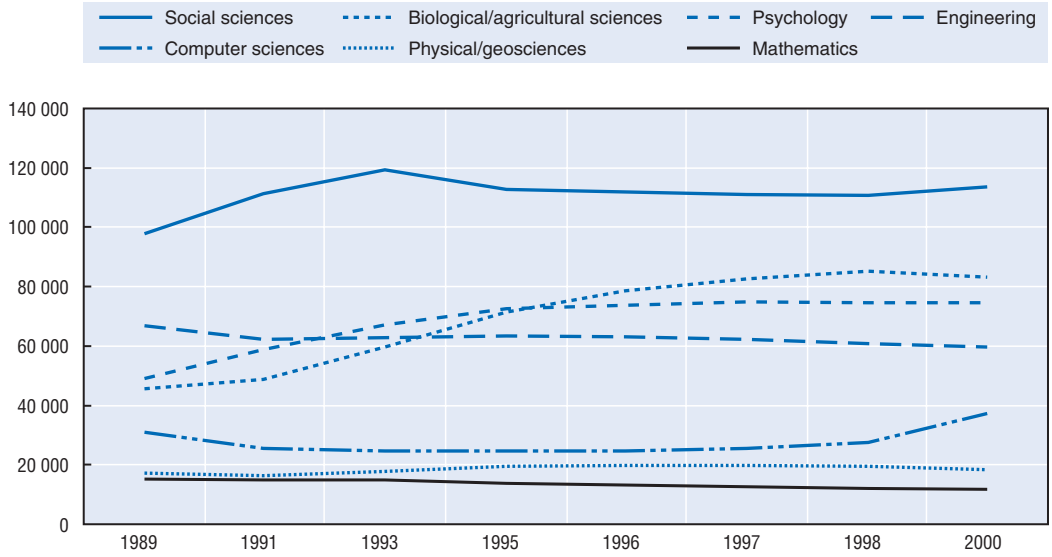
continued rise at a higher level illustrates the time-lagged influence of business cycles on the choices of younger students.

Data for the United States reveal similar differences in the supply of scientists and engineers by level of degree and field of study. At the undergraduate level, the number of science and engineering graduates increased steadily from 323 000 in 1989 to almost 400 000 in 2000. Gains have been strongest in the biological and agricultural sciences, followed by computer sciences, psychology and social sciences. The number of bachelor degree graduates in engineering has fallen since the 1990s, and that of graduates in the physical sciences and mathematics has stagnated or declined in recent years, perhaps because of movement into other fields (*e.g.* computer sciences) (Figure 5.6a). At the PhD level, degrees awarded in all science and engineering fields increased during the beginning of the 1990s, but began to tail off towards the end of the decade. Degrees in engineering dropped most noticeably after 1997, following more than a decade of significant growth. Reductions in the physical sciences were also pronounced, while those in the social sciences and biological and agricultural sciences declined to a lesser degree (Figure 5.6b).

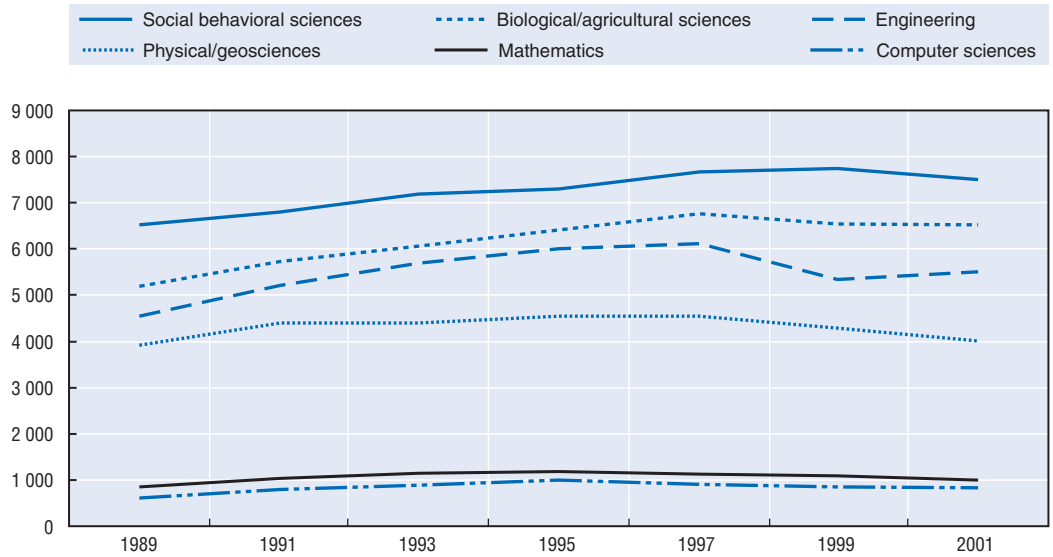
In the longer term, US graduation rates may benefit from growing enrolments. Enrolments in undergraduate engineering programmes increased after 1999 to around 421 000 in 2002 (NSF, 2004). Data on undergraduate science enrolments are not available (owing in part to the structure of the US higher education system and the possibility that students may change their field of study during their course of study), but the NSF reports that at least 30% of first-year university students intend to major in science and engineering – a figure far above current graduation rates. Historically, fewer than half of first-year students who intend to major in science and engineering actually complete their

Figure 5.6. **Number of US degrees awarded in science and engineering fields**

a. Bachelor's degrees



b. Doctoral degrees



Source: NSB (2004b).

degrees within five years. At the graduate level, the number of students enrolled in US science and engineering programmes grew rapidly after 1999 to 455 000 in 2002, more than compensating for the declines of the mid-1990s which were especially pronounced in the social sciences and the physical sciences (Table 5.2). New graduate enrolments (first-time graduate students) also rose sharply, from 75 000 in 1999 to 87 000 in 2002, possibly as a result of the economic downturn in the United States and the end of the dot.com era, which had lured many students away from graduate studies, especially in high-technology fields. These enrolments could push up US PhD production in future years.

Table 5.2. **US graduate student enrolment in science and engineering, 1992-2002**

Graduate students	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
All graduate students	430 517	435 723	431 142	422 466	415 181	407 630	404 856	411 182	413 536	429 242	455 355
Full time	290 408	293 905	292 979	287 171	284 039	280 669	278 943	283 893	291 355	304 021	325 699
First time	83 102	79 280	78 038	74 364	73 448	73 600	74 373	75 447	78 332	82 411	86 921
Other	207 306	214 625	214 941	212 807	210 591	207 069	204 570	208 446	213 023	221 610	238 778
Part time	140 109	141 818	138 163	135 295	131 142	126 961	125 913	127 289	122 181	125 221	129 656
Men	280 305	279 185	272 031	262 256	253 510	245 619	241 429	242 786	243 057	251 812	266 521
Women	150 212	156 538	159 111	160 210	161 671	162 011	163 427	168 396	170 479	177 430	188 834
Post-docs	23 883	24 665	25 787	26 160	26 569	27 264	27 876	28 980	30 224	30 194	32 075

Source: National Science Foundation/Division of Science Resources Statistics, *Survey of Graduate Students and Post-doctorates in Science and Engineering*, 2002.

Comparing tertiary enrolment data and international mathematics and science tests

While tertiary enrolment data provide insight into the near-term trends in the future supply of science and technology workers, international benchmarking studies such as the OECD PISA (Programme for International Student Assessment) survey or the TIMSS (Third International Math and Science Study), can provide an indication of countries' longer-term potential to produce science and engineering graduates. According the 2001 PISA Assessment of Reading, Mathematical and Scientific Literacy, Japan, Korea, New Zealand, Finland and Australia ranked highest in mathematical literacy. In scientific literacy, Korea, Japan, Finland, the United Kingdom and Canada ranked highest. Among the larger EU countries, France ranked 10th in mathematics and 12th in scientific literacy while Germany ranked 20th in both mathematical and scientific literacy (OECD, 2003).

In general, there is a positive but imperfect relationship between the ranking of countries whose students score high in mathematics and science and their ranking in the production of science and engineering graduates and researchers. Finland, for example, has the highest number of researchers per 10 000 workers in the OECD area, and ranks second in the share of science and engineering enrolments in tertiary education, fourth in the share of PhDs in science and engineering and seventh in terms of the share of university graduates with degrees in science and engineering. Finnish students performed well on both the science and technology literacy PISA assessments. Japan, however, ranks first in mathematical literacy among OECD countries and third in terms of researchers per 10 000 in the workforce but nineteenth in share of science and engineering enrolments and twelfth in terms of the percentage of science and engineering graduates. Differences in ranking most likely reflect differences in student interest and performance at different levels and stages of their higher education system, although, as noted above, the relationship between entrants into tertiary education and numbers of graduates and science and technology workers is not direct. Nevertheless, the OECD countries whose youth score high in international mathematics and science tests are among those with the largest numbers of science and engineering graduates and PhDs relative to other graduates and with relatively large supplies of researchers.

Meeting demand through immigration

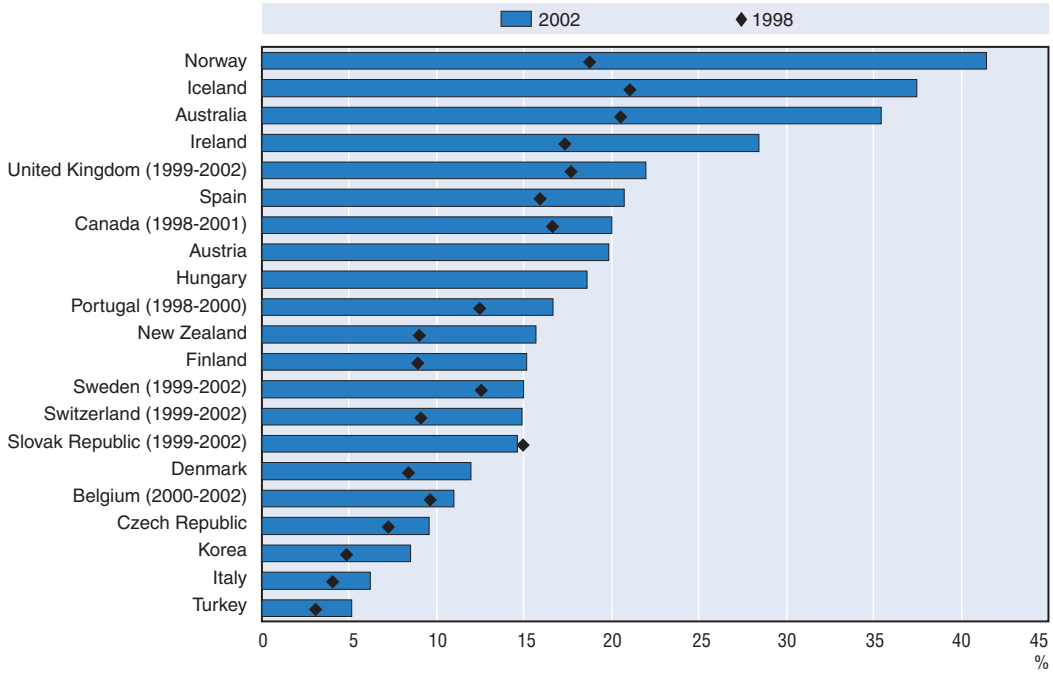
One way in which governments seek to increase the pool of graduates and science and technology professionals is to attract foreign talent. International mobility widens the pool of scientific talent, helping firms and institutions to meet demand, especially in specialised areas, and improves the diffusion of knowledge between institutions and across borders. While economic factors play a role in decisions to migrate, factors such as strong support for research and an entrepreneurial climate of close co-operation between public research and industry are also important, perhaps more so for young researchers. In fact, surveys indicate that much of the international migration of scientists and engineers

Box 5.3. Supply and demand for ICT workers

There have been recurrent concerns about shortages of workers in information and communication technologies. Since the mid-1990s and with growing business demand for IT professionals, many OECD countries expanded the number of degree programmes in information technology. Between 1998 and 2002, the number of students enrolled in computing as a share of all students enrolled in science and technology programmes at tertiary level nearly doubled in Australia, Finland, Iceland, Ireland and Norway (Figure 5.7). Thus, and despite the fact that non-tertiary education institutions increasingly provide IT-related training, enrolments in computing account for a larger share of science and engineering enrolments at tertiary level than in the past. National data for a number of countries, including the United States, show however that undergraduate and graduate enrolments in computer science programmes has tapered off since 2000, partly in response to a drop in demand for IT-related workers following the internet bubble.

The current downturn in demand for IT specialists has dampened recruitment of foreign IT talent in a number of OECD countries (*e.g.* the United States, Germany). Data on holders of temporary visas for high-technology workers (with universities among the top recruiters) show a drop in petitions since the 2001 downturn in the US economy and greater scrutiny in the aftermath of 11 September 2001. The US government has recently lowered the number of H-1B visas from 195 000 to its former level of 65 000. While IT-related workers accounted for just over half of the approved H-1B petitions in FY 2001, their share fell to around 38% in FY 2002 (OECD, 2004a).

Figure 5.7. **Share of new students enrolled in computing, 1998-2002**
As a percentage of total science and technology enrolment at tertiary level



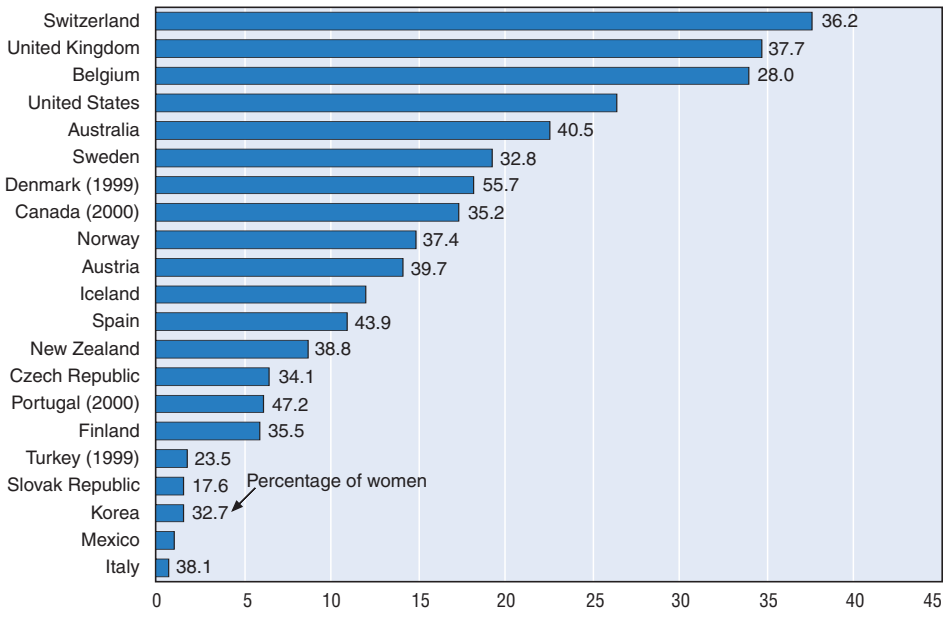
Note: OECD harmonised enrolment data are not available for France, Germany and the United States.
Source: OECD Education database, 2004.

is highly localised around knowledge-intensive clusters and centres of excellence. For young researchers, mobility is often a means of obtaining world-class training (*e.g.* at post-doctorate level) that may not be available locally.

The international mobility of students, scholars and other highly skilled workers has increased over the past decade, driven in part by the globalisation of higher education and changes to the immigration legislation of OECD countries that favour skilled migrants. In 2000 there were 1.5 million foreign students enrolled in higher education institutions in OECD countries compared to half that figure just two decades earlier (OECD, 2003a). The United States, United Kingdom, Australia and Canada together host more than half of all foreign students in the OECD area. Among the main sending countries are China, Korea, India, and Japan. EU countries attract more students from within Europe (54% of foreign students in Europe are European).

The share of foreigners in the student population is higher at the graduate level than at the first university level (bachelor degree). In absolute terms, the United States receives more foreign PhD-level students than other OECD countries. In relative terms, however, Switzerland, the United Kingdom and Belgium have a greater share of foreigners among their PhD-level students (Figure 5.8). The number of foreign PhDs in science and engineering more than doubled between 1985 and 1996 in the United States. Most recent foreign PhDs in the United States, however, are on temporary visas, a trend that increased in the 1990s. The United States also receives a significant number of non-student, non-immigrant scholars (around 86 015 in 2001-02, representing an average annual growth rate of 4.6% since 1993-94). As with most highly skilled migration flows to the United States, the majority of the scholars are from Asia. Around 18% are from China; but around half come from other OECD countries including Japan and Korea. For most OECD countries, nationals who are scholars in the United States represent only 2% to 4% of the country's university researcher population. This share is higher, however, for certain sending countries such as Russia and Korea. While the United Kingdom sends students and scholars to the United States, it is also a receiving country. According to the Higher Education Statistics Agency, the number of foreign academics in the United Kingdom reached 3 185 in 2001-02, up 21% from 1995-96 (HESA, 2004).

Figure 5.8. **Foreign PhD students as a percentage of total PhD enrolment, 2001**



Source: OECD, Education database, 2004.

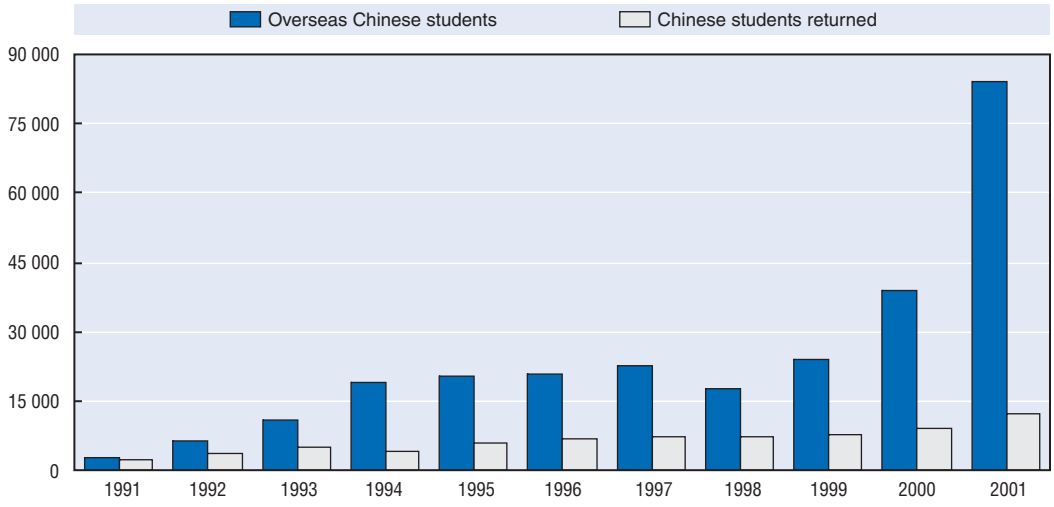
Recent US data show a slight drop in the number of first-time foreign PhD students and foreign scholars on temporary visas in the country, although the number of foreign PhD graduates has continued to rise (NSF, 2004). The drop in first-time foreign PhD students has been attributed in part to stricter immigration rules, as well as growing competition from other OECD countries. Indeed, the United Kingdom reported a 21% rise in number of students from non-EU countries over the 2001-02 and 2002-03 year (from 152 625 students to 184 685). Australia also experienced a significant rise in international student enrolment in higher education, from 86 269 in 2001 to 136 252 in 2003. Since 1994, the number of foreign students enrolled in Australia's higher education system has more than tripled, but only 539 of these were enrolled in PhD degree programmes in the natural sciences, engineering and information technology in 2003 (OSS, 2003; Mervis, 2004).

Furthermore, data on the percentage of foreign PhDs in the United States who plan to remain in the country two years after graduation reveal that the stay rate has continued to rise, from 49% in 1987 to 71% in 2001. Stay rates of foreign students differ, however: over 50% of foreign students from France and the United Kingdom and 70% of those from China had plans to stay in the United States in 2001 (NSF, 2004). However, while Chinese students have a high stay rate, data from the Chinese Ministry of Science and Technology reveal that a growing number of overseas Chinese students are returning, contributing to China's economic and scientific development. Still the numbers of returning students are far below the number of students going abroad (Figure 5.9).

The United States continues to attract a large number of foreign science and engineering students at the graduate level, despite growing competition from other OECD countries and the recent decrease in new first-time foreign graduate students and scholars. Although there are concerns that as sending countries develop their own opportunities for research and innovation, the number of students going abroad will fall or those returning will increase, receiving countries in the OECD area will not necessarily suffer. The development of global research and innovation networks between returning foreign researchers and their former host countries can offer opportunities for both sending and receiving countries. Some research shows that foreign PhDs that leave the United States, for example, return at a later date for further research or business purposes (Regets, 2004).

Several OECD countries in Europe and elsewhere are also expanding their efforts to retain national and foreign talent as well as foster the return migration of expatriate researchers. For example, the

Figure 5.9. **Outward and return migration of Chinese students, 1991-2001**



Source: Gao Changlin, data from MOST, *China Science and Technology Indicators 2002*.

Box 5.4. Supply of science and technology graduates in non-OECD countries

Non-OECD countries account for a growing share of the world's supply of university graduates. For example, the number of university graduates in China in 2000 (739 000) was equivalent to 13% of the total number of graduates in the OECD area. The Chinese Ministry of Science and Technology (MOST) reports that more than half of university graduates receive degrees in science and engineering. The number of graduates from India's universities is equivalent to around 12% of the OECD total while the number of Russian university graduates is equivalent to 11% the OECD total. While many students from non-OECD countries continue to receive a large part of their advanced higher education in OECD countries – around 84 000 Chinese students were studying abroad in 2001 – more and more of them are receiving university degrees, including at the PhD level, in their home countries. For example, while OECD countries produced 147 000 PhDs in 2000, China, Brazil, India, Russia and Thailand collectively produced 87 115, equivalent to around 60% of the OECD total.

Despite the success of non-member economies in increasing the supply of science and technology graduates, they too face a number of policy challenges. In Russia, the policy focus is on encouraging graduates to pursue careers in research and teaching in order to offset the reduction in researcher employment and the rapid ageing of the research workforce. Like OECD countries, India also reports declining interest in science among youth, as evidenced by a declining in enrolments in science and engineering. China, which ranks third worldwide in the number of researchers, is currently revising curricula to improve the quality of higher education under the *University Teaching Quality and Teaching Reform Project*. Although over 50% of tertiary graduates in China receive degrees in science and engineering, there has been a gradual increase in the share of graduates in areas such as business, law and entrepreneurship. The Chinese Ministry of Personnel has espoused a policy of encouraging highly skilled overseas Chinese to return to China, and their numbers rose on average by 13% a year in the 1990s. Related to this goal, the Ministry is supporting the construction of university laboratories and the development of science parks to provide venture opportunities for returning Chinese as well as employment opportunities for young graduates.

Source: OECD; Chinese Ministry of Science and Technology, 2004.

Canadian Foundation for Innovation (CFI), which funds research infrastructure at universities and research hospitals, recently announced a CAD 23.8 million investment by the New Opportunities Fund and the Infrastructure Operating Fund for some 124 projects involving 140 researchers at 40 institutions and across a wide spectrum of frontline research.

The French government has launched a regional development plan, "Attractiveness of Regions" (*Attractivité du territoire*) that will provide funding to help institutions recruit high-quality foreign researchers to France as well as to facilitate the return migration of French post-doctorates (Commissariat général du Plan, 2004). In Spain, the government's Ramon Cayal programme is providing 2 000 temporary research positions (with five-year contracts) in public research centres and universities, in addition to regular procedures for tenure-track jobs, in order to increase science and technology capabilities in public labs and universities. The programme also aims to offer stable jobs to excellent researchers returning from abroad and to increase their employability and improve their academic career opportunities. Meanwhile, the UK is expected to enact an entitlement that will allow foreign students in science, technology, engineering and mathematics to work in the United Kingdom for 12 months. New scholarships (Dorothy Hodgkin Postgraduate Awards) will be granted to over 100 PhD students from India, China, Hong Kong (China), Russia and other developing countries for study in the United Kingdom. The German government plans to increase the share of foreign students from 8.5% to 10%, but also to increase the share of German students having studied abroad from 14% to 20% by 2010.

What can governments do to foster domestic development of HRST?

For most OECD countries, recruiting foreign talent is neither sufficient to meet long-term demand for trained scientists and researchers in business and universities nor politically or economically sustainable. One of the lessons from OECD countries such as Finland that have succeeded in increasing the supply of science and technology graduates at all levels is that policies should focus on the entire supply pipeline, from primary and secondary schooling to university education and PhD training, and should involve industry to leverage competencies and resources (Arajarvi, 2004, Academy of Finland, 2003). Over the past few years, OECD countries have implemented a range of initiatives to stimulate the domestic supply of graduates and improve the attractiveness of research careers:[2]

- R*aise interest in and awareness of science, especially among youth* via science fairs, science days and science years (*e.g. Jahr der Physik* in Germany in 2000), demonstration projects at schools, and the creation and renovation of science museums. Australia has established a nation-wide touring outreach programme for secondary students, Smart Moves, which aims to motivate young people's interest in science and entrepreneurship. In Germany, the research competition for students, *Jugend forscht*, as well as the International Mathematical, Physics, Chemical and Biological Olympiads, are used to encourage young people to pursue studies in mathematics and science. Ireland has implemented a programme, known as Discover Engineering and Science, to raise the general awareness of the physical sciences and encourage more students to study the subjects at second and third level and to pursue careers in this area (*www.science.ie*).

- I*mprove teacher training*. At the primary and secondary level, OECD countries like Finland, the United States and the United Kingdom have implemented measures to improve the quality of science and mathematics teachers, ranging from the recruitment of Master's and PhD graduates for secondary-school teaching to raising salary levels and incentives for teachers. In the United States, where some 56% of students studying the physical sciences and 27% of students in mathematics at secondary schools are taught by teachers without formal qualifications in the field, the Math and Science Partnership (MSP) programme, funded at USD 260 million in 2003, links primary and secondary school teachers with scientists and mathematicians at higher education institutions. Norway launched new education programmes in 2003 to provide training for teachers in mathematics and science, as has Ireland.

- R*evise curricula*. Universities in OECD countries have also reviewed undergraduate curricula and reformed PhD training in order to make programmes more responsive to student needs and demands from industry. Some have created interdisciplinary programmes, linking biologists with computer scientists, for example, in order to meet demand for skills in bioinformatics. Universities are also partnering with industry to train PhDs and post-doctorates to improve the match between researcher skills and industry demands. Other countries have shortened degree programmes in a bid to reduce dropout rates. Universities in the EU, as well as in Switzerland, have also moved to harmonise degrees along the bachelor-master system up to doctorate level to improve recognition of diplomas and foster mobility between member states.

- R*ecruit women and other under-represented populations*. Most OECD countries, including Canada, Germany, Korea, the Netherlands, the United Kingdom and the United States have measures to improve participation of women in science and engineering (Box 5.5). Yet it is not just a question of encouraging women to study science; firms and higher education institutions can do more to recruit and retain women in research. Measures are also being implemented to increase the participation of national minorities in science education, especially in the United Kingdom, the United States and the Netherlands.

- I*ncrease funding for PhD students and post-docs*. Science Foundation Ireland, the Irish Research Council for the Humanities and Social Sciences and the Irish Research Council for Science, Engineering

2. For a more detailed summary of recent policy initiatives in the area of human resources in science and technology, readers should refer to Chapter 2 in this publication.

Box 5.5. Women in science and technology

OECD countries have long sought to increase the participation of women in science and engineering education and careers not only to improve social equity in higher education and the workplace but also to increase the overall supply of science and engineering graduates.

The share of women among university graduates now exceeds that of men in several countries; however women account for only 30% of university degrees in science and engineering and 27% of all PhDs. In 2002, the share of women enrolled in science and engineering studies ranged from a low of 12.7% in Japan to 39.7% in New Zealand. Participation by women in PhD studies varies greatly by country, ranging from 22.8% of PhD graduates in Japan in 2001 compared to 42.7% in France, 45% in the United States, 50.8% in Italy.

Women also tend to have lower rates of participation in international student mobility, in particular at graduate level. In 2002, the percentage of women among foreign PhDs enrolled in the Slovak Republic was 18% compared to 36% in Switzerland; 41% in Australia and 55.7% in Denmark. The share of women among foreigners with science and engineering PhDs residing in the United States in 1999 was 17.7% for nationals from the United Kingdom and 22.5% for nationals from Germany.

Although women account for close to half of the workers in science and technology occupations (broadly defined), their share among researchers is quite small in many countries. Women researchers account for 19.4% of researchers in the higher education sector in Japan; 26.6% in Switzerland; 43.3% in Sweden and 32.3% in France. Fewer women than men also report being interested in science according to EU and US public opinion surveys (Eurobarometer, 2001; NSF, 2004).

OECD countries are taking a variety of steps to improve the representation of women among science and technology graduates and researchers. Measures range from grants to support positions for women at universities to preferential policies towards equally qualified women candidates. Recent research suggests that efforts to close the gender gap in science must begin at the earliest levels of schooling. On the employment side, equal opportunity policies, flexible working hours and parental leave are also important for encouraging women to pursue research careers in the public and private sectors.

and Technology have introduced several programmes to fund post-graduate researchers in third-level institutions. The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) is increasing the amount of competitive research funding while expanding opportunities for post-doctoral fellows and others to participate in research projects supported with competitive funds, as well as promoting various support programmes for bright doctoral students and post-doctoral fellows (*e.g.* Japan Society for the Promotion of Science). In France, the Ministry for Research has increased funding for the training programme "Young Men and Women Researchers" (*Jeunes chercheuses et jeunes chercheurs*) by 17% over the last year in order to encourage graduates to remain in research.

The above measures focus largely on the supply side, but demand-side policies are also important for avoiding a drop in graduates and increasing supply. Business framework conditions that encourage firms, including SMEs, to invest in R&D and innovation help broaden the demand for science and technology graduates. As the service economy continues to grow in OECD countries, incentives for innovation and R&D activities in the service sector widen job opportunities for science and technology graduates; this in turn contributes to overall economic competitiveness. Diversifying the demand for science and technology graduates is especially important in countries where the public research sector is the main employer of researchers. By diversifying the demand for science and technology graduates across economic sectors, countries can limit the risk of a sudden drop in enrolments in response to a temporary or cyclical reduction in public or business R&D spending.

Governments should also focus on demand-side policies for HRST to improve the match between supply and demand and avoid skill mismatches or worse, a "brain loss" or "brain drain" whereby graduates, unable to find appropriate jobs take lower-level jobs or are forced to emigrate:

- *Foster mobility of young researchers.* Disincentives and barriers to the mobility of graduates and young researchers can prevent labour markets from clearing and aggravate shortages or skill

mismatches. The EU, through programmes such as the Marie Curie fellowships, is making it easier for researchers to move across borders, but barriers remain (*e.g.* language, as well as issues related to moving a family or finding work for spouses or affordable housing). OECD countries such as France and Japan have reformed employment regulations in the public sector to allow researchers to work in industry for a limited period while retaining their employment status. Proposals are also afoot in Italy to allow university staff to carry out remunerative activities outside the university.

- I*ncrease the attractiveness of public research employment*. Several OECD governments are increasing access to and number of public research jobs. The French government plans to create additional contract-based positions in public labs for three to five years and some 1 000 new posts for university researchers by 2005, in line with its objective to raise total R&D funding to 3% of GDP. The United Kingdom is increasing financial support for PhDs and post-docs following a recent government review.
- M*ake employment more flexible*. This is one way to help firms and universities attract and retain young people in research while being responsive to changes in research funding and priorities. The Italian government is currently considering reforms to public research employment that would provide new PhDs with renewable five-year contracts after which they would compete for permanent professorships. A key challenge for governments and research institutions is achieving flexibility in employment while promoting attractive career progression.
- I*mprove the provision of information regarding job opportunities for young graduates, especially in the business sector*. Given that there is a significant time lag between changes in the labour market and the response of higher education systems, there is also a strong argument for governments and education institutions to improve the provision of information about the labour market for students in science and technology. This can also be a means to make potential PhD science and engineering graduates aware of careers outside academia.

Conclusion and outlook

Recent trends in business R&D spending as well as in the higher education sector suggest that demand for science and engineering trained personnel will continue to grow. The transition to knowledge-based economies will require increasing numbers of scientists, engineers and professionals, including researchers. As efforts are made to bolster R&D spending throughout the OECD area, demand may expand further, whether or not specific targets are achieved. Demographic changes will result in the retirement of many current science and technology workers, creating a need for even more new scientists and engineers to enter the workforce. Most OECD countries are taking this challenge seriously and have or are implementing a range of policies to increase the supply of new science and engineering graduates and to improve the attractiveness of scientific studies and of research careers.

The ability of supplies of new graduates to meet demand will vary considerably across countries and fields of science and technology. Available statistics do not show dramatic reductions in science and engineering graduates across the OECD area; they show instead that the overall number of tertiary-level science and engineering graduates continued to expand at the turn of the century in the EU, Canada, Japan, Korea and the United States. The larger EU economies such as France and the United Kingdom experienced positive growth in the number of science and engineering graduates at the tertiary level overall, but they have witnessed recent declines in enrolments in specific scientific fields (physics and chemistry) and at lower levels of tertiary education. Germany, however, has experienced a drop in science and engineering graduates and has suffered a drop in enrolments in fields like physics and chemistry. The situation is somewhat more positive in the Nordic countries, which have in general seen solid growth in the number and share of science and engineering graduates. Enrolments in science and engineering have also continued to rise, especially in Denmark and Iceland where they have grown faster than total university enrolments. Among the new EU members in Central and Eastern Europe, the situation is somewhat mixed. The number of graduates in science and engineering increased in Poland and the Czech Republic but fell in Hungary. Meanwhile enrolments in science and engineering have

grown more slowly than total enrolment in all three countries. In Japan and Korea, the number of science and engineering graduates increased over the period, but in both countries, enrolments in science and engineering grew less rapidly than total enrolments. The growth in US science and engineering graduates was concentrated among science graduates; the number of engineering graduates actually slipped a little. US graduate enrolments have recently recovered after declining at the end of the 1990s.

The longer-term outlook for supply and demand will depend on a variety of factors: an upturn in economic growth and investment in R&D might reduce the risk of prolonged drop in enrolments and graduates and the risk of shortages on the labour market. It might also create more opportunities for researchers in the business sector, especially in the EU. On the other hand, a sustained decline in business R&D or public research funding might discourage prospective students from seeking careers in research. Much will depend on the causes of the decline in enrolments and graduate rates and the ability of market and policies to respond. Governments play a key role in ensuring that young people and firms have incentives to invest in science and engineering education. Supply-side policies should focus on the entire educational pipeline from primary to university education. OECD data show that the leading countries with the largest number of science and engineering graduates and PhDs relative to other graduates and a greater supply of researchers are among those that score highest in international youth mathematics and science tests. This would tend to suggest there is a positive association between early success in these subjects and the supply of science and engineering graduates. At the same time, success on the labour market is an important and positive signal for young people considering scientific studies. Demand-side policies such as those that stimulate demand for young researchers or make public research careers more attractive and rewarding are needed to ensure that young people continue to invest in science and engineering education.

Finally, most of the world's investment in R&D remains concentrated in OECD countries, but a growing share of the supply of science and engineering graduates is being generated in non-OECD countries (*e.g.* China, Singapore, Chinese Taipei, India and Brazil). While the higher education and research systems in OECD countries will continue to provide science and technology graduates from non-OECD countries with opportunities for further training and employment, in the longer term, a greater capacity for R&D in terms of institutions, human resources and finance in other parts of the world will put pressure on OECD countries to raise the quantity and quality of their science and technology workforce.

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Statistical Annex

MAIN OECD DATABASES USED

Databases maintained by the Directorate for Science, Technology and Industry (DSTI)

Industrial structure and performance

STAN: The database for **Industrial Analysis** includes annual measures of output, labour input, investment and international trade which allow users to construct a wide range of indicators focused on areas such as productivity growth, competitiveness and general structural change. The industry list provides sufficient details to enable users to highlight high-technology sectors and is compatible with those used in related OECD databases. STAN is primarily based on member countries' annual National Accounts by activity tables and uses data from other sources, such as national industrial surveys/censuses, to estimate any missing detail. Since many of the data points in STAN are estimated, they do not represent the official member country submissions.

The latest version of STAN is based on the International Standard Industrial Classification (ISIC) Rev. 3 and covers all activities (including services). Further details on STAN are available on the Internet at: *www.oecd.org/sti/stan*.

P*ublication*: STAN is available on line on SourceOECD (*www.sourceoecd.org*), updated on a "rolling" basis (*i.e.* new tables are posted as soon as they are ready) to maximise timeliness. In May 2004, a CDROM was published providing a snapshot of the STAN industrial database together with related databases covering R&D Expenditure and Bilateral Trade by industry (ANBERD and BTD) as well as a set of derived indicators (*http://oecdpublications.gfi-nb.com/cgi-bin/*OECDB*ookS*h*op.storefront*/EN/*product*/922004063C3).

Science and technology

R&D and TBP: The **R&D** database contains the full results of the OECD surveys on **R&D expenditure and personnel** from the 1960s. The **TBP** database presents information on the **technology balance of payments**. These databases serve, *inter alia*, as the raw material for both the ANBERD and MSTI databases.

P*ublication*: OECD (2004), *Research and Development Statistics*: 2003 E*dition*. Annual on CD-ROM (a printed edition is also available every two years).

MSTI: The **Main Science and Technology Indicators** database provides a selection of the most frequently used annual data on the scientific and technological performance of OECD member countries and eight non-member economies (Argentina, China, Israel, Romania, Russian Federation, Singapore, Slovenia, Chinese Taipei). The indicators, expressed in the form of ratios, percentages, growth rates, cover resources devoted to R&D, patent families, technology balance of payments and international trade in highly R&D-intensive industries.

P*ublication*: OECD (2004), *Main Science and Technology Indicators* 2004/1. Biannual. Also available on CD-ROM.

ANBERD: The **Analytical Business Enterprise Research and Development** database is an estimated database constructed with a view to creating a consistent data set that overcomes the problems of international comparability and time discontinuity associated with the official business enterprise R&D data provided to the OECD by its member countries. ANBERD contains R&D expenditures for the period 1987-2001, by industry (ISIC Rev. 3), for 19 OECD countries.

P*ublication*: OECD (forthcoming), *Research and Development Expenditure in Industry*, 1987-2002. Annual. Also available on line and on the CD-Rom STAN Structural Analysis databases (*http://oecdpublications.gfi-nb.com/cgi-bin/*OECDB*ookS*h*op.storefront*/EN/*product*/922004063C3).

Patent database: This database contains patents filed at the largest national patent offices – European Patent Office (EPO); US Patent and Trademark Office (USPTO); Japanese Patent Office (JPO) – and other national or regional offices. Each patent is referenced by: patent numbers and dates (publication, application and priority); names and countries of residence of the applicants and of the inventors; and technological categories, using the national patent classification as well as the International Patent Classification (IPC). The compiled indicators mainly refer to single patent counts in a selected patent office, as well as counts of "triadic" patent families (patents filed at the EPO, the USPTO and the JPO to protect a single invention).

The series are published on a regular basis in OECD, *Main Science and Technology Indicators*.

Globalisation and international trade

AFA: The **Activities of Foreign Affiliates** database presents detailed data on the performance of foreign affiliates in the manufacturing industry of OECD countries (inward and outward investment). The data indicate the increasing importance of foreign affiliates in the economies of host countries, particularly in production, employment, value added, research and development, exports, wages and salaries. AFA contains 18 variables broken down by partner country and by industrial sector (based on ISIC Rev. 3) for 22 OECD countries.

Publication: OECD, *Measuring Globalisation: The Role of Multinationals in* OECD *Economies*, 2001 Edition. Vol. I: Manufacturing. Biennial. Also available on line on SourceOECD (*www.sourceoecd.org*).

FATS: This database gives detailed data on the **activities of foreign affiliates** in the **service** sector of OECD countries (inward and outward investment). The data indicate the increasing importance of foreign affiliates in the economies of host countries and of affiliates of national firms implanted abroad. FATS contains five variables (production, employment, value added, imports and exports) broken down by country of origin (inward investments) or implantation (outward investments) and by industrial sector (based on ISIC Rev. 3) for 19 OECD countries.

Publication: OECD, *Measuring Globalisation: The Role of Multinationals in* OECD *Economies*, 2001 Edition. Vol. II: Services. Biennial. Soon available on line.

Bilateral Trade (BTD): This database for industrial analysis includes detailed trade flows by manufacturing industry between a set of OECD *declaring* countries and a selection of *partner* countries and geographical regions. Data are presented in thousands of USD at current prices, and cover the period 1988-2001. The data have been derived from the OECD database *International Trade by Commodities Statistics* (ITCS – formerly *Foreign Trade Statistics* or FTS). Imports and exports are grouped according to the country of origin and the country of destination of the goods. The data have been converted from product classification schemes to an activity classification scheme based on ISIC Rev.3, that matches the classification currently used for the OECD's STAN, Input-Output tables and ANBERD databases.

Publication: OECD, *Bilateral Trade Database*, 2002. Also available on CD-ROM with STAN and ANBERD databases (*http://oecdpublications.gfi-nb.com/cgi-bin/*OECDBookShop.storefront/EN/*product*/922004063C3).

Information and communication technology (ICT)

Telecommunications: This database is produced in association with the biennial *Communications Outlook*. It provides time-series data covering all OECD countries for the period 1980-2001. It contains both telecommunication and economic indicators.

Publication: OECD (2003), *Telecommunications Database* 2003. Only available on diskette and CD-ROM.

ICT: Work is under way to develop a database on ICT supply and ICT usage statistics. Statistics on employment, value added, production, wages and salaries, number of enterprises, R&D, imports and exports for the ICT sector are been collected following the OECD ICT sector definition based on ISIC Rev. 3.

Publication: OECD (2002), *Measuring the Information Economy*, 2002. Freely available as a Web book with "clickable" access to the data used in charts and figures at: *www.oecd.org/sti/measuring-infoeconomy*.

Current country coverage of main DSTI databases used in this publication

	Industry	Science and technology					Globalisation			ICT
	STAN	R&D	TBP	MSTI	ANBERD	Patents	AFA	FATS	BTD	Telecom.
Australia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Austria	✓	✓	✓	✓		✓		✓	✓	✓
Belgium	✓	✓	✓	✓	✓	✓		✓	✓	✓
Canada	✓	✓	✓	✓	✓	✓	✓		✓	✓
Czech Republic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Denmark	✓	✓	✓	✓	✓	✓			✓	✓
Finland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
France	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Germany	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Greece	✓	✓		✓		✓	✓	✓	✓	✓
Hungary	✓	✓	✓	✓		✓	✓	✓	✓	✓
Iceland		✓		✓		✓			✓	✓
Ireland		✓		✓	✓	✓	✓	✓	✓	✓
Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Japan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Korea	✓	✓	✓	✓	✓	✓			✓	✓
Luxembourg	✓			✓		✓	✓	✓	✓	✓
Mexico	✓	✓	✓	✓		✓	✓		✓	✓
Netherlands	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
New Zealand	✓	✓	✓	✓		✓			✓	✓
Norway	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Portugal	✓	✓	✓	✓		✓	✓	✓	✓	✓
Slovak Republic	✓	✓	✓	✓		✓	✓		✓	✓
Spain	✓	✓	✓	✓	✓	✓	✓		✓	✓
Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Switzerland		✓	✓	✓		✓			✓	✓
Turkey		✓		✓		✓	✓	✓	✓	✓
United Kingdom	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
United States	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Other OECD databases

ADB: Analytical DataBase (Economics Department).

ANA: Annual National Accounts (Statistics Directorate).

Education database (Directorate for Education).

ITCS: International Trade in Commodities Statistics (Statistics Directorate).

International Direct Investment (Directorate for Financial, Fiscal and Enterprise Affairs).

LFS: Labour Force Statistics (Statistics Directorate).

SSIS: Structural Statistics for Industry and Services (Statistics Directorate).

Services: Value Added and Employment (Statistics Directorate).

Further details on OECD statistics are available on the Internet at: *www.oecd.org/statistics/*.

STANDARD STATISTICAL NOTES USED IN THIS PUBLICATION FOR SCIENCE AND TECHNOLOGY INDICATORS

a) Break in series with previous year.
b) Estimate.
c) Defence excluded (all or mostly).
d) Including R&D in the social sciences and humanities.
e) Excluding R&D in the social sciences and humanities.
f) Federal or central government only.
g) Excludes data for the R&D content of general payment to the higher education sector for combined education and research.
h) Excludes most or all capital expenditure.
i) Total intramural R&D expenditure instead of current intramural R&D expenditure.
j) Overestimated or based on overestimated data.
k) Underestimated or based on underestimated data.
l) Included elsewhere.
m) Includes other classes.
n) Provisional.
o) At current exchange rate and not at current purchasing power parities.
p) Unrevised breakdown not adding to the revised total.
q) Does not correspond exactly to the OECD recommendations.
r) Including extramural R&D expenditure.

STANDARD INDUSTRY AGGREGATION BY TECHNOLOGY LEVEL

(*based on* ISIC Revision3)

The *high-technology* industries (HT) are defined as the sum of:

- Pharmaceuticals (2423),
- Office and computing machinery (30),
- Radio, TV and communication equipment (32),
- Medical, precision and optical equipment (33),
- Aircraft and spacecraft (353).

The *medium-high-technology* industries (MHT) are defined as the sum of:

- Chemicals excluding pharmaceuticals (24 excl. 2423),
- Machinery and equipment (29),
- Electrical machinery and apparatus (31),
- Motor vehicles and trailers (34),
- Railroad and transport equipment (352+359).

The *medium-low-technology* industries (MLT) are defined as the sum of:

- Coke, refined petroleum products and nuclear fuel (23),
- Rubber and plastic products (25),
- Other non-metallic mineral products (26),
- Basic metals (27),
- Fabricated metal products except machinery and equipment (28),
- Building and repairing of ships and boats (351).

The *low-technology industries* (LT) are defined as the sum of:

- Food products, beverages and tobacco (15-16),
- Textiles, textile products, leather and footwear (17-19),
- Wood, pulp, paper, paper products, printing and publishing (20-22),
- Manufacturing n.e.c. and recycling (36-37).

ANNEX TABLES

Table 1. Breakdown of GDP per capita into its components, 1990-2003

United States = 100

	GDP per capita (US=100)		Effect of labour force participation (%)										GDP per person employed (US=100)		GDP per hour worked (US=100)	
			Total effect		Working-age population[1] to total population		Labour force to working-age population		Unemployment		Working hours					
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)=(1)-(2)	
	1990	2003	1990	2003	1990	2003	1990	2003	1990	2003	1990	2003	1990	2003	1990	2003
Australia[2]	73	78	-1	1	-10	-10	9	11	-1	0	1	1	75	77	73	77
Austria	82	79	-	-	-10	-9	14	14	1	0	-	-13	77	74	-	87
Belgium	78	76	-26	-30	-10	-12	-6	1	-1	-2	-9	-17	95	89	104	106
Canada	83	83	-3	3	-12	-10	14	15	-2	-1	-2	-2	83	79	86	81
Czech Republic	48	43	1	2	-7	-3	7	3	1	-1	-	3	47	44	-	41
Denmark	79	80	-11	-14	-10	-12	17	16	-1	0	-17	-19	73	75	90	93
Finland	78	73	-1	-9	-10	-10	12	9	2	-2	-5	-6	74	77	79	82
France	79	77	-25	-30	-12	-13	0	5	-3	-3	-10	-19	94	88	104	106
Germany	96	70	-14	-19	-9	-9	8	10	1	-2	-14	-18	95	72	110	90
Greece	49	54	-12	-10	-9	-10	-5	-1	-1	-2	3	4	64	67	61	63
Hungary[3]	35	39	-3	-9	-5	-4	1	-5	1	0	-	-	38	48	-	-
Iceland	87	80	10	12	-15	-12	23	21	3	2	0	0	77	69	77	68
Ireland	56	90	-21	-13	-13	-11	-5	5	-6	1	4	-8	80	94	77	102
Italy	75	70	-31	-29	-9	-9	-9	-6	-4	-3	-9	-12	97	88	106	100
Japan[2]	81	74	12	3	-7	-8	9	12	3	0	7	0	76	71	69	71
Korea	32	47	-4	-1	-3	-3	-2	1	1	1	-	-	36	48	-	-
Luxembourg	108	137	-14	-13	-10	-18	-9	2	6	4	-	-	122	150	-	-
Mexico	27	26	-47	-35	-32	-27	-17	-10	2	2	-	1	74	61	-	60
Netherlands	77	80	-46	-37	-8	-9	-12	1	0	3	-26	-31	97	86	123	117
New Zealand	60	62	-7	1	-2	0	-3	0	-2	1	-1	0	66	61	67	61
Norway	78	96	-21	-27	-13	-16	13	20	0	1	-22	-32	77	92	99	123
Poland	26	31	-4	-7	-4	-2	-	-2	-	-6	-	3	-	41	-	38
Portugal	46	49	-2	-3	-7	-6	4	7	0	0	1	-4	49	48	48	53
Slovak Republic[4]	28	35	-5	-6	-4	-3	1	2	-3	-5	-	0	33	41	-	41
Spain	57	62	-24	-10	-9	-8	-10	3	-5	-4	0	0	81	72	81	72
Sweden	81	75	-6	-13	-14	-13	19	12	3	1	-14	-13	74	75	87	88
Switzerland	107	82	8	3	-11	-10	27	23	5	1	-12	-11	86	68	98	80
Turkey	20	18	-8	-10	-5	-3	-2	-6	-1	-1	-	-	28	29	-	-
United Kingdom	71	78	-4	-5	-11	-12	11	12	0	1	-3	-6	72	77	75	83
United States	100	100	0	0	0	0	0	0	0	0	0	0	100	100	100	100
Total OECD	**69**	**81**	**-28**	**-9**	**-10**	**2**	**-3**	**2**	**1**	**-1**	**-17**	**-13**	**81**	**77**	**97**	**90**
EU-25[4]	**65**	**69**	**-11**	**-4**	**-9**	**-6**	**1**	**4**	**-4**	**-2**	**-**	**-**	**76**	**73**	**-**	**-**
EU-15	**76**	**75**	**-20**	**-15**	**-10**	**-7**	**1**	**6**	**-1**	**-2**	**-10**	**-12**	**86**	**78**	**96**	**90**

1. 15-64 years. 2. 2002 instead of 2003. 3. 1991 instead of 1990. 4. 1994 instead of 1990.

Source: OECD, GDP from National Accounts database; other data from *OECD Economic Outlook* 75, 2004.
Complementary estimates for hours worked from *OECD Employment Outlook*, 2004.

StatLink: http://dx.doi.org/10.1787/515628628843

Table 2. Income and productivity levels in the OECD, 1950-2002

	GDP per capita (US=100)						GDP per hour worked (US=100)					
	1950	1973	1980	1990	2000	2003	1950	1973	1980	1990	2000	2003
Australia[1]	77	76	75	73	74	78	72	69	72	73	77	77
Austria	42	73	81	82	79	79	-	-	-	-	90	87
Belgium	60	76	81	78	73	76	59	85	102	104	108	106
Canada	81	86	91	83	80	83	85	86	88	86	84	81
Czech Republic	50	57	58	48	39	43	-	-	-	-	37	41
Denmark	80	91	87	79	79	80	60	81	89	90	95	93
Finland	46	69	74	78	72	73	35	60	64	79	84	82
France	55	78	82	79	73	77	46	77	88	104	103	106
Germany	42	74	78	96	70	70	39	76	88	110	92	90
Greece	24	56	57	49	47	54	-	-	-	61	60	63
Hungary[2]	39	51	43	35	33	39	-	-	-	-	-	-
Iceland	-	72	87	87	79	80	-	59	74	77	69	68
Ireland	38	43	49	56	79	90	-	46	58	77	96	102
Italy	41	70	78	75	70	70	43	83	97	106	108	100
Japan	20	67	71	81	73	-	15	47	55	69	72	72
Korea	9	15	20	32	43	47	7	10	16	-	-	-
Luxembourg	-	98	92	108	137	137	-	-	-	-	-	-
Mexico	27	31	35	27	26	26	31	42	-	-	63	60
Netherlands	67	83	84	77	76	-	59	92	106	123	116	117
New Zealand	94	79	68	60	58	62	-	81	71	67	63	61
Norway	63	74	91	78	101	96	57	79	101	99	133	123
Poland	29	36	35	26	29	31	-	-	-	-	35	38
Portugal	22	44	43	46	48	49	19	40	-	48	53	53
Slovak Republic	38	43	44	-	30	35	-	-	-	-	35	41
Spain	28	57	56	57	57	62	25	56	69	81	75	72
Sweden	69	78	78	81	75	75	58	79	83	87	90	88
Switzerland	100	114	106	107	84	82	86	96	101	98	86	80
Turkey	15	17	17	20	19	18	-	-	-	-	-	-
United Kingdom	72	72	69	71	71	78	61	64	70	75	81	83
United States	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*

1. 2002 instead of 2003. 2. 1991 instead of 1990.

Source: Previous annex; *OECD Science, Technology and Industry Scoreboard,* 2003.

StatLink: http://dx.doi.org/10.1787/482201516226

Table 3. Gross R&D expenditures, 1981-2003

Millions constant USD (1995 PPPs)

	1981	1991	1995	2000	2001	2002	2003
Australia[1, 2]	2 362	5 141	6 570	7 107	-	-	-
Austria	1 457	2 488 [b]	2 821 [b]	3 855 [b]	4 019 [b,n]	4 098 [b,n]	4 131 [b,n]
Belgium[3]	2 605 [a]	3 350 [b]	3 762	5 110	5 488	-	-
Canada	5 843	9 373	11 250	15 373	16 529	16 072 [n]	16 065 [b,n]
Czech Republic	-	2 324 [c,q]	1 257 [a]	1 760	1 771	1 800	-
Denmark[4]	945	1 773	2 159	2 854	3 272	3 471	-
Finland	904 [a]	1 938 [a]	2 218	4 162	4 221	4 374	-
France	17 870 [a]	27 961	28 461	30 646 [a]	31 994	31 923 [n]	-
Germany	27 895	41 987 [a]	39 412 [b]	47 838 [b]	48 518	48 934 [b]	48 426 [b]
Greece[4]	205 [a]	484	671 [a]	1 056	1 106 [b]	-	-
Hungary	-	981 [c,q]	684 [c]	908 [c]	1 116 [c]	1 249 [c]	-
Iceland	29	68	93	207 [b]	237	238 [b]	-
Ireland	251	487 [b]	822 [b]	1 184 [b]	1 253 [b]	-	-
Italy	7 914 [r]	13 880 [a]	11 892	13 975	14 830	-	-
Japan	38 752 [b,j]	74 412 [b,j]	75 659 [b,j]	90 184	93 007	94 172	-
Korea	-	7 563 [e]	12 919 [e]	17 374 [e]	19 721 [e]	20 858 [e]	-
Luxembourg	-	-	-	318	-	-	-
Mexico	-	-	1 935	3 037	3 194	-	-
Netherlands	4 304	6 076	6 650	7 649	7 670	-	-
New Zealand[4]	-	524	605	712	873 [a]	-	-
Norway[4]	937	1 512	1 765 [a]	2 055	2 296	2 358 [b]	-
Poland	-	-	1 881 [a]	2 472	2 407	2 244	-
Portugal[5, 1]	271	780	751	1 279 [b]	1 371	1 512 [b]	-
Slovak Republic	-	868 [b,c,q]	405 [c]	340 [k]	346 [k]	326 [k]	-
Spain	1 754	4 944	5 010	6 998	7 314	8 090	-
Sweden[4]	3 234 [a,k]	4 883 [k]	6 294 [a,k]	7 715 [k]	9 503 [k]	-	-
Switzerland[1, 2]	3 233 [b]	4 739	4 971	5 255	-	-	-
Turkey	-	1 538	1 284	2 627	-	-	-
United Kingdom	19 201 [a]	21 673	22 498	24 816	25 530	26 207	-
United States	114 530 [h]	176 578 [h]	184 079 [h]	243 271 [h]	246 187 [h]	245 430 [h,n]	248 064 [b,h,n]
Total OECD	**254 691 [b]**	**414 522 [a,b]**	**438 558 [a,b]**	**553 399 [b]**	**569 275 [b]**	**574 708 [b,n]**	**-**
EU-25	**-**	**-**	**138 328 [b]**	**166 859 [b]**	**172 704 [b]**	**175 929 [b,n]**	**-**
EU-15	**88 551 [b]**	**132 558 [a,b]**	**133 421**	**160 547 [b]**	**166 123 [b]**	**169 525 [b,n]**	**-**
China	-	13 824 [k]	18 022 [k]	45 002 [a]	52 399	65 485	-
Israel	-	1 937 [c]	2 630 [c]	5 613 [c]	5 937 [c,n]	5 516 [c,n]	-
Russian Federation	-	23 032	7 475	10 537	12 277	13 651	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991.
2. 1996 instead of 1995.
3. 1983 instead of 1981.
4. 1999 instead of 2000.
5. 1982 instead of 1981.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/367403882784

Table 4. GERD intensity, 1981-2003

As a percentage of GDP

	1981	1991	1995	2000	2001	2002	2003
Australia[1, 2]	0.94	1.52	1.66	1.54	-	-	-
Austria	1.13	1.47 [b]	1.56 [a,b]	1.86 [b]	1.92 [b,n]	1.93 [b,n]	1.94 [b,n]
Belgium[3]	1.56 [a]	1.62 [b]	1.72	2.04	2.17	-	-
Canada	1.24	1.60	1.72	1.92	2.03	1.91 [n]	1.87 [b,n]
Czech Republic	-	2.02 [c,q]	1.01 [a]	1.33	1.30	1.30	-
Denmark[4]	1.06	1.64	1.84	2.19	2.40	2.52	-
Finland	1.18 [a]	2.04 [a]	2.28	3.40	3.41	3.46	-
France	1.93 [a]	2.37	2.31	2.18 [a]	2.23	2.20 [n]	-
Germany	2.43	2.52 [a]	2.25 [b]	2.49 [b]	2.51	2.52 [b]	2.50 [b]
Greece[4]	0.17 [a]	0.36	0.49 [a]	0.67	0.65 [b]	-	-
Hungary	-	1.06 [c,q]	0.73 [a,c]	0.80 [c]	0.95 [c]	1.02 [c]	-
Iceland	0.64	1.17	1.57	2.75 [b]	3.06	3.09 [b]	-
Ireland	0.68	0.93 [b]	1.28 [b]	1.15 [b]	1.15 [b]	-	-
Italy	0.88 [r]	1.23 [a]	1.00	1.07	1.11	-	-
Japan	2.12 [j]	2.76 [j]	2.69 [j]	2.99	3.07	3.12	-
Korea	-	1.92 [e]	2.50 [e]	2.65 [e]	2.92 [e]	2.91 [e]	-
Luxembourg	-	-	-	1.71	-	-	-
Mexico	-	-	0.31	0.37	0.39	-	-
Netherlands	1.79	1.97	1.99 [a]	1.90	1.89	-	-
New Zealand[4]	-	0.98	0.96	1.02	1.18 [a]	-	-
Norway[4]	1.18	1.64	1.70 [a]	1.65	1.60	1.67	-
Poland	-	-	0.65 [a]	0.66	0.64	0.59 [b]	-
Portugal[5, 1]	0.30	0.61	0.57 [a]	0.80 [b]	0.85	0.93 [b]	-
Slovak Republic	-	2.13 [c,q]	0.93 [c]	0.65 [k]	0.64 [k]	0.58 [k]	-
Spain	0.41	0.84	0.81 [a]	0.94	0.95	1.03	-
Sweden[4]	2.22 [a,k]	2.72 [k]	3.35 [a,k]	3.65 [k]	4.27 [k]	-	-
Switzerland[1, 2]	2.12 [b]	2.59	2.67	2.57	-	-	-
Turkey	-	0.53	0.38	0.64	-	-	-
United Kingdom	2.38 [a]	2.07	1.95	1.84	1.86	1.88	-
United States	2.34 [h]	2.72 [h]	2.51 [h]	2.72 [h]	2.74 [h]	2.67 [h,n]	2.62 [b,h,n]
Total OECD	**1.93 [b]**	**2.22 [a,b]**	**2.09 [a,b]**	**2.24 [b]**	**2.28 [b]**	**2.26 [b,n]**	**-**
EU-25	**-**	**-**	**1.72 [b]**	**1.80 [b]**	**1.83 [b]**	**1.83 [b,n]**	**-**
EU-15	**1.67 [b]**	**1.90 [a,b]**	**1.80**	**1.88 [b]**	**1.92 [b]**	**1.93 [b,n]**	**-**
China	-	0.74 [k]	0.60 [k]	1.00 [a]	1.07	1.23	-
Israel	-	2.50 [c]	2.74 [c]	4.72 [c]	5.04 [c,n]	4.72 [c,n]	-
Russian Federation	-	1.43	0.85	1.05	1.16	1.24	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991.
2. 1996 instead of 1995.
3. 1983 instead of 1981.
4. 1999 instead of 2000.
5. 1982 instead of 1981.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/036108151783

Table 5. GERD by source of funds, 1981-2003

As a percentage of total national R&D expenditures

	Business enterprise						Government					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia[1, 2, 3]	20.2 [p]	44.0	47.8	46.3 [-]	-	-	72.8 [p]	50.2	45.8	45.7 [-]	-	-
Austria	50.2	50.3 [b]	45.3 [b]	39.9 [b,n]	40.3 [b,n]	40.8 [b,n]	46.9	46.5 [b]	47.3 [b]	41.1 [b,n]	40.9 [b,n]	40.4 [b,n]
Belgium[4]	64.8 [a]	64.8 [b]	67.1	64.3	-	-	33.4 [a]	31.3 [b]	23.1	21.4	-	-
Canada	40.8	38.2	45.7	48.3	45.3 [n]	44.3 [n]	50.6	45.7 [b]	35.9 [b]	30.5 [b]	33.3 [b,n]	34.0 [b,n]
Czech Republic	-	-	63.1	52.5	53.7	-	-	-	32.3	43.6	42.1	-
Denmark	42.5 [a]	51.4	45.2	61.5 [s]	-	-	53.5	39.7	39.6	28.0 [s]	-	-
Finland	54.5 [a]	56.3 [a]	59.5	70.8	69.5	-	43.4 [a]	40.9 [a]	35.1	25.5	26.1	-
France	40.9 [a]	42.5	48.4	54.2	-	-	53.4 [a]	48.8	41.9	36.9	-	-
Germany	56.9	61.7 [a]	60.0 [b]	65.7	65.6 [b]	65.1 [b]	41.8	35.9 [a]	37.9 [b]	31.4	31.5 [b]	32.1 [b]
Greece	21.4 [a]	21.8	25.5 [a]	29.7 [b]	-	-	78.6 [a]	57.7	53.9 [a]	46.9 [b]	-	-
Hungary	-	56.0 [c,q,s]	38.4 [c,s]	34.8 [c,s]	29.7 [c,s]	-	-	40.0 [c,q,s]	53.1 [c,s]	53.6 [c,s]	58.6 [c,s]	-
Iceland	5.7	24.5	34.6	46.2	-	-	85.6	69.7	57.3	34.0	-	-
Ireland[3]	37.7	60.6 [b]	72.3 [b,p]	66.0 [b]	-	-	56.5	27.9 [b]	22.5 [b,p]	22.6 [b]	-	-
Italy	50.1 [r]	44.4 [a]	41.7	-	-	-	47.2 [r]	49.6 [a]	53.0	-	-	-
Japan	67.7 [j]	77.4 [j]	72.3 [j]	73.0	73.9	-	24.9 [k]	16.4 [k]	20.9 [k]	18.5 [b]	18.2 [b]	-
Korea	-	-	76.3	72.5 [e]	72.2 [e]	-	-	-	19.0	25.0 [e]	25.4 [e]	-
Luxembourg[3]	-	-	-	91.0 [-]	-	-	-	-	-	7.7 [-]	-	-
Mexico	-	-	17.6	29.8	-	-	-	-	66.2	59.1	-	-
Netherlands	46.3	47.8	46.0	51.8	-	-	47.2	48.6	42.2	36.2	-	-
New Zealand	-	27.4	33.7	37.1 [a]	-	-	-	61.8	52.3	46.4 [a]	-	-
Norway	40.1	44.5	49.9 [a]	51.7	-	-	57.2	49.5	44.0 [a]	39.8	-	-
Poland	-	-	36.0 [a]	30.8	31.0	-	-	-	60.2 [a]	64.8	61.1	-
Portugal[5, 1]	30.0	20.2	19.5	31.5	-	-	61.9	59.4	65.3 [a]	61.0	-	-
Slovak Republic	-	68.3 [c,q]	60.4 [c]	56.1 [j]	53.6 [j]	-	-	31.7 [c,q]	37.8 [c]	41.3	44.1	-
Spain	42.8	48.1	44.5	47.2	48.9	-	56.0	45.7	43.6 [a]	39.9	39.1	-
Sweden	54.9 [a]	61.9	65.5 [a]	71.9	-	-	42.3 [a]	34.0	28.8 [a]	21.0	-	-
Switzerland[1, 2, 3]	75.1 [b]	67.4	67.5	69.1 [-]	-	-	24.9 [b]	28.4	26.9	23.2 [-]	-	-
Turkey[3]	-	28.5	32.9	42.9 [-]	-	-	-	70.1	62.4	50.6 [-]	-	-
United Kingdom	42.1 [a]	49.6	48.2	47.3	46.7	-	48.1 [a,b]	35.0	32.8	28.5	26.9	-
United States	49.4 [h]	57.2 [h]	60.2 [h]	67.3 [h]	64.4 [h,n]	63.1 [h,n]	47.8 [h]	38.9 [h]	35.4 [h]	27.8 [h]	30.2 [h,n]	31.2 [h,n]
Total OECD	**51.7** [b]	**58.7** [a,b]	**59.4** [a,b]	**63.6** [b]	**62.3** [b,n]	**-**	**44.1** [b]	**35.7** [a,b]	**34.0** [a,b]	**28.9** [b]	**29.9** [b,n]	**-**
EU-25	**-**	**-**	**51.9** [b]	**55.4** [b]	**-**	**-**	**-**	**-**	**39.4** [b]	**34.7** [b]	**-**	**-**
EU-15	**48.7** [b]	**52.0** [a,b]	**52.2**	**56.0** [b]	**-**	**-**	**46.7** [b]	**41.1** [a,b]	**39.1**	**34.1** [b]	**-**	**-**
China[3]	-	-	-	57.6 [s]	-	-	-	-	-	33.4 [s]	-	-
Israel[3]	-	43.5 [c]	47.7 [c]	69.6 [c,n]	-	-	-	36.9 [c]	35.9 [c]	24.7 [c]	-	-
Russian Federation	-	-	33.6	33.6	33.1	-	-	-	61.5	57.2	58.4	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991.
2. 1996 instead of 1995.
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4. 1983 instead of 1981.
5. 1982 instead of 1981.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/442056514762

Table 5. GERD by source of funds, 1981-2003 (cont'd)

As a percentage of total national R&D expenditures

	Other national sources						Abroad					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia[1, 2, 3]	2.1 [p]	3.9	4.4	4.8 [-]	-	-	1.0 [p]	1.8	2.1	3.3 [-]	-	-
Austria	0.4	0.3 [b]	0.4 [b]	0.3 [b,n]	0.3 [b,n]	0.3 [b,n]	2.5	3.0 [b]	7.1 [b]	18.7 [b,n]	18.5 [b,n]	18.5 [b,n]
Belgium[4]	0.8 [a]	1.0 [b]	2.3	2.5	-	-	1.0 [a]	3.0 [b]	7.5	11.8	-	-
Canada	4.8	6.7 [b]	6.9 [b]	8.4 [b]	9.4 [b,n]	10.0 [b,n]	3.8	9.4	11.6	12.9	12.0 [n]	11.7 [n]
Czech Republic	-	-	1.3	1.7	1.5	-	-	-	3.3	2.2	2.7	-
Denmark	2.0 [a]	4.6	4.3	2.6 [s]	-	-	2.1	4.4	11.0	7.8 [s]	-	-
Finland	1.1 [a]	1.5 [a]	1.0	1.2	1.2	-	1.0 [a]	1.3 [a]	4.5	2.5	3.1	-
France	0.7 [a]	0.7	1.7	1.7	-	-	5.0 [a]	8.0	8.0	7.2	-	-
Germany	0.4	0.5 [a]	0.3 [b]	0.4	0.4 [b]	0.4 [b]	1.0	2.0 [a]	1.8 [b]	2.5	2.5 [b]	2.4 [b]
Greece	-	0.7	2.5 [a]	2.0 [b]	-	-	-	19.9	18.2 [a]	21.4 [b]	-	-
Hungary	-	0.1 [c,q,s]	0.5 [c,s]	0.4 [c,s]	0.3 [c,s]	-	-	1.8 [c,q,s]	4.9 [c,s]	9.2 [c,s]	10.4 [c,s]	-
Iceland	4.4	1.7	3.7	1.6	-	-	4.3	4.1	4.4	18.3	-	-
Ireland[3]	1.1	2.2 [b]	1.9 [b,p]	2.6 [b]	-	-	4.8	9.4 [b]	8.5 [b,p]	8.9 [b]	-	-
Italy	0.0 [r]	-	-	-	-	-	2.7 [r]	6.1 [a]	5.3	-	-	-
Japan	7.3 [b,k]	6.1 [b,k]	6.7 [b,k]	8.1 [b]	7.6 [b]	-	0.1 [b,k]	0.1 [b,k]	0.1 [b,k]	0.4	0.4	-
Korea	-	-	4.7	2.1 [e]	2.0 [e]	-	-	-	0.0	0.5 [e]	0.4 [e]	-
Luxembourg[3]	-	-	-	-	-	-	-	-	-	1.3 [-]	-	-
Mexico	-	-	9.5	9.8	-	-	-	-	6.7	1.3	-	-
Netherlands	1.3	1.8	2.6	1.1 [a]	-	-	5.2	1.9	9.3	11.0	-	-
New Zealand	-	8.2	10.1	9.9 [a]	-	-	-	2.5	3.9	6.6 [a]	-	-
Norway	1.4	1.3	1.2 [a]	1.4	-	-	1.4	4.6	4.9 [a]	7.1	-	-
Poland	-	-	2.1 [a]	2.0	3.2	-	-	-	1.7 [a]	2.4	4.8	-
Portugal[5, 1]	4.8	5.4	3.3	2.4	-	-	3.3	15.0	11.9 [a]	5.1	4.9 [b]	-
Slovak Republic	-	-	0.1 [c]	0.8 [j]	0.3 [j]	-	-	-	1.6 [c]	1.9 [j]	2.1 [j]	-
Spain	0.1 [l]	0.6	5.2 [a]	5.3	5.2	-	1.1	5.6	6.7	7.7	6.8	-
Sweden	1.4 [a]	2.7	2.2 [a]	3.8	-	-	1.5 [a]	1.5	3.4 [a]	3.4	-	-
Switzerland[1, 2, 3]	-	2.3	2.5	3.4 [-]	-	-	-	1.9	3.1	4.3 [-]	-	-
Turkey[3]	-	1.3	2.7	5.3 [-]	-	-	-	0.2	2.0	1.2 [-]	-	-
United Kingdom	3.0 [a]	3.5	4.5	5.8	5.9	-	6.9 [a]	11.9	14.5	18.4	20.5	-
United States	2.8 [h]	3.9 [h]	4.4 [h]	5.0 [h]	5.4 [h,n]	5.7 [h,n]	-	-	-	-	-	-
Total OECD	**2.9** [b]	**3.5** [a,b]	**4.0** [a,b]	**4.6** [b]	**4.8** [b,n]	**-**	**-**	**-**	**-**	**-**	**-**	**-**
EU-25	**-**	**-**	**1.9** [b]	**2.2** [b]	**-**	**-**	**-**	**-**	**6.7** [b]	**7.6** [b]	**-**	**-**
EU-15	**1.1** [b]	**1.3** [a,b]	**1.8** [b]	**2.2** [b]	**-**	**-**	**3.5** [b]	**5.6** [a,b]	**6.9**	**7.8** [b]	**-**	**-**
China[3]	-	-	-	-	-	-	-	-	-	2.7 [s]	-	-
Israel[3]	-	13.1 [c]	12.0 [c]	2.8 [c,n]	-	-	-	6.5 [c]	4.4 [c]	2.8 [c,n]	-	-
Russian Federation	-	-	0.3	0.5	0.4	-	-	-	4.6	8.6	8.0	-

Times series notes:

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Source: OECD, MSTI database, May 2004.

Table 6. GERD by two main sources of funds, as a percentage of GDP, 1981-2003

	Industry						Government					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia[1, 2, 3]	0.19 [p]	0.67	0.79	0.71 [-]	-	-	0.69 [p]	0.76	0.76	0.70 [-]	-	-
Austria	0.57	0.74 [b]	0.70 [a,b]	0.77 [b,n]	0.78 [b,n]	0.79 [b,n]	0.53	0.68 [b]	0.74 [a,b]	0.79 [b,n]	0.79 [b,n]	0.78 [b,n]
Belgium[4]	1.01 [a]	1.05 [b]	1.15	1.40	-	-	0.52 [a]	0.51 [b]	0.40	0.47	-	-
Canada	0.51	0.61	0.79	0.98	0.86 [n]	0.83 [b,n]	0.63	0.73 [b]	0.62 [b]	0.62 [b]	0.64 [b,n]	0.64 [b,n]
Czech Republic	-	-	0.64	0.68	0.70	-	-	0.59 [c,k,q]	0.33 [c,k,q]	0.57	0.55	-
Denmark	0.45	0.84	0.83	1.48 [s]	-	-	0.57	0.65	0.73	0.67 [s]	-	-
Finland	0.64 [a]	1.15	1.36	2.41	2.40	-	0.51 [a]	0.83 [a]	0.80	0.87	0.90	-
France	0.79	1.01	1.12	1.21	-	-	1.03 [a]	1.16	0.97	0.82	-	-
Germany	1.38	1.55 [a]	1.35	1.65	1.66 [b]	1.63 [b]	1.01	0.90 [a]	0.85	0.79	0.80 [b]	0.80 [b]
Greece	0.04	0.08	0.12 [a]	0.19	-	-	0.14 [a]	0.21	0.26 [a]	0.31	-	-
Hungary	-	0.59 [m,q,s]	0.28 [a,s]	0.33 [s]	0.30 [s]	-	-	0.42 [c,m,q]	0.39 [a,c,s]	0.51 [c,s]	0.60 [c,s]	-
Iceland	0.04	0.29	0.54	1.41	-	-	0.54	0.82	0.90	1.04	-	-
Ireland[3]	0.26	0.56 [b]	0.92 [b,p]	0.76 [b]	-	-	0.38	0.26 [b]	0.29 [b,p]	0.26 [b]	-	-
Italy	0.44 [r]	0.54 [a]	0.42	-	-	-	0.42 [r]	0.61 [a]	0.53	-	-	-
Japan	1.44 [j]	2.14 [j]	1.95 [j]	2.24	2.31	-	0.53 [b]	0.45 [b]	0.56 [b]	0.57 [b]	0.57 [b]	-
Korea	-	-	1.91	2.12 [e]	2.10 [e]	-	-	-	0.48	0.73 [e]	0.74 [e]	-
Luxembourg[3]	-	-	-	1.56 [-]	-	-	-	-	-	0.13 [-]	-	-
Mexico	-	0.10 [b,j,q]	0.05	0.12	-	-	-	0.21 [f,q]	0.20	0.23	-	-
Netherlands	0.83	0.94	0.91 [a]	0.98	-	-	0.84	0.95	0.84 [a]	0.68	-	-
New Zealand	-	0.27	0.32	0.44 [a]	-	-	-	0.61	0.50	0.55 [a]	-	-
Norway	0.47	0.73	0.85 [a]	0.83	-	-	0.67	0.81	0.75	0.64	-	-
Poland	-	-	0.23	0.20	0.18 [b]	-	-	-	0.39 [a]	0.41	0.36 [b]	-
Portugal[5, 1]	0.09	0.12	0.11 [a]	0.27	-	-	0.18	0.36	0.37 [a]	0.52	-	-
Slovak Republic	-	1.46 [q]	0.56	0.36	0.31	-	-	0.68 [c,q]	0.35 [c]	0.26 [k]	0.25 [k]	-
Spain	0.18	0.40	0.36 [a]	0.45	0.50	-	0.23	0.38	0.35 [a]	0.38	0.40	-
Sweden	1.22 [a,k]	1.69 [k]	2.20 [k]	3.07 [k]	-	-	0.94 [a,k]	0.93 [k]	0.96 [a,k]	0.90 [k]	-	-
Switzerland[1, 2, 3]	1.59 [b]	1.75	1.80	1.77 [-]	-	-	0.53 [b]	0.74	0.72	0.60 [-]	-	-
Turkey[3]	-	0.15	0.13	0.28 [-]	-	-	-	0.37	0.24	0.32 [-]	-	-
United Kingdom	1.00	1.03	0.94	0.88	0.88	-	1.15 [a,b]	0.72	0.64	0.53	0.50	-
United States	1.16 [h]	1.56 [h]	1.51 [h]	1.85 [h]	1.72 [h,n]	1.65 [b,h,n]	1.12 [h]	1.06 [h]	0.89 [h]	0.76 [h]	0.81 [h,n]	0.82 [b,h,n]
Total OECD	**1.00 [b]**	**1.30 [a,b]**	**1.24 [a,b]**	**1.45 [b]**	**1.41 [b,n]**	**-**	**0.85 [b]**	**0.79 [a,b]**	**0.71 [a,b]**	**0.66 [b]**	**0.68 [b,n]**	**-**
EU-25	**-**	**-**	**0.89 [b]**	**1.01 [b]**	**-**	**-**	**-**	**-**	**0.68 [b]**	**0.63 [b]**	**-**	**-**
EU-15	**0.81 [b]**	**0.99 [a,b]**	**0.94**	**1.07 [b]**	**-**	**-**	**0.78 [b]**	**0.78 [a,b]**	**0.70**	**0.65 [b]**	**-**	**-**
China[3]	-	-	-	0.58 [s]	-	-	-	-	-	0.33 [s]	-	-
Israel[3]	-	1.09	1.31	3.29 [n]	-	-	-	0.92 [c]	0.98 [c]	1.17 [c]	-	-
Russian Federation	-	-	0.29	0.39	0.41	-	-	-	0.52	0.67	0.73	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991.
2. 1996 instead of 1995.
3. 2000 instead of 2001.
4. 1983 instead of 1981.
5. 1982 instead of 1981.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/846033432367

Table 7. R&D expenditures by sector of performance, 1981-2003

As a percentage of total national R&D expenditures

	Business enterprise						Higher education					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia[1, 2, 3]	25.0 [b]	44.2	48.2	47.5 [-]	-	-	28.6	26.2	26.3	26.8 [-]	-	-
Austria[4]	55.9	-	-	63.6	-	-	32.8	-	-	29.7	-	-
Belgium[5]	70.6 [a]	66.5 [b]	71.3	73.7	-	-	19.2 [a]	26.2 [b]	23.9	19.2	-	-
Canada	48.1	49.7	58.1	59.6	55.2 [n]	53.7 [n]	26.7	30.6	26.8	29.3	32.8 [n]	34.9 [n]
Czech Republic	-	69.4 [c,q]	65.1 [c,q]	60.2	61.1	-	-	1.6 [c,q]	8.5 [c,q]	15.7	15.6	-
Denmark	49.7	58.5	57.4	68.7	69.3	-	26.7	22.6	24.5	18.8	23.1 [a]	-
Finland	54.7 [a]	57.0 [a]	63.2	71.1	69.9	-	22.2 [a]	22.1 [a]	19.5	18.1	19.2	-
France	58.9 [a]	61.5	61.0	63.2 [a]	62.2 [n]	-	16.4 [a]	15.1	16.7	18.9	19.5 [n]	-
Germany	69.0	69.4 [a]	66.3 [b]	69.9	69.4 [b]	69.1 [b]	17.1	16.2 [a]	18.2 [b]	16.4	16.9 [b]	17.1 [b]
Greece	22.5 [a]	26.1	29.5 [a]	32.7 [b]	-	-	14.5 [a]	33.8	44.3 [a]	44.9 [b]	-	-
Hungary	-	41.4 [c,q,s]	43.4 [c,s]	40.1 [c,s]	35.5 [c,s]	-	-	20.3 [c,q,s]	24.8 [c,s]	25.7 [c,s]	25.2 [c,s]	-
Iceland	9.6	21.8	31.9	58.9	57.2 [b]	-	26.0	29.4	27.5	18.8	16.1 [b]	-
Ireland	43.6	63.6 [b]	70.0 [b]	69.7 [b]	-	-	16.0	23.2 [b]	20.4 [b]	22.4 [b]	-	-
Italy	56.4 [r]	55.8 [a]	53.4	49.1	-	-	17.9 [r]	21.5 [a]	25.5	32.6	-	-
Japan	66.0 [b,j]	75.4 [b,j]	70.3 [b,j]	73.7	74.4	-	17.6 [b,k]	12.1 [b,k]	14.5 [b,k]	14.5	13.9	-
Korea	-	-	73.7	76.2 [e]	74.9 [e]	-	-	-	8.2	10.4 [e]	10.4 [e]	-
Luxembourg[3]	-	-	-	92.6 [-]	-	-	-	-	-	0.3 [-]	-	-
Mexico	-	-	20.8	30.3	-	-	-	-	45.8	30.4	-	-
Netherlands	53.3	49.7	52.1	58.3	-	-	23.2	29.7	28.8	27.0	-	-
New Zealand	-	26.8	27.0	36.5 [a]	-	-	-	28.6	30.7	30.3 [a]	-	-
Norway	52.9	54.6	56.7 [a]	59.7	57.4	-	29.0	26.7	26.0 [a]	25.7	26.8	-
Poland	-	-	38.7 [a]	35.8	21.4	-	-	-	26.3 [a]	32.7	33.5	-
Portugal[6, 1]	31.2	21.7	20.9 [a]	31.8	34.4 [b]	-	20.6	43.0	37.1 [a]	36.7	35.6 [b]	-
Slovak Republic	-	74.6 [c,q]	53.9 [c]	67.3 [j]	64.3 [j]	-	-	3.9 [c,q]	5.9 [c]	9.0 [j]	9.1 [j]	-
Spain	45.5	56.0	48.2	52.4	54.6 [a]	-	23.0	22.2	32.0	30.9 [b]	29.8	-
Sweden	63.7 [a,j]	68.5	74.3 [a]	77.6	-	-	30.0 [a,j]	27.4 [j]	21.9 [a,h,j]	19.4 [j]	-	-
Switzerland[1, 2, 3]	74.2 [b]	70.1	70.7	73.9 [-]	-	-	19.9 [b]	25.0	24.3	22.9 [-]	-	-
Turkey[3]	-	21.1	23.6	33.4 [-]	-	-	-	71.1	69.0	60.4 [-]	-	-
United Kingdom	63.0 [a]	67.1	65.0	66.8 [a]	67.0	-	13.6 [a]	16.7	19.2	21.8	22.6	-
United States	71.2 [h]	72.5 [h]	71.8 [h]	73.0 [h]	70.2 [h,n]	68.9 [h,n]	13.2 [h]	14.5 [h]	15.2 [h]	14.5 [h]	15.9 [h,n]	16.8 [h,n]
Total OECD	**66.2** [b]	**68.8** [a,b]	**67.2** [a,b]	**69.3** [b]	**68.0** [b,n]	**-**	**16.0** [b]	**16.3** [a,b]	**17.5** [a,b]	**17.4** [b]	**18.1** [b,n]	**-**
EU-25	**-**	**-**	**61.6** [b]	**64.0** [b]	**63.6** [b,n]	**-**	**-**	**-**	**20.8** [b]	**21.5** [b]	**-**	**-**
EU-15	**62.3** [b]	**63.4** [a,b]	**62.1** [b]	**64.7** [b]	**64.4** [b,n]	**-**	**17.6** [a,b]	**18.8** [a,b]	**20.8** [a,b]	**21.4** [b]	**-**	**-**
China	-	39.8 [k,s]	43.7 [k,s]	60.4	61.2	-	-	8.6 [j,s]	12.1 [j,s]	9.8	10.1	-
Israel	-	55.7 [c]	58.7 [c]	75.3 [c,n]	73.0 [c,n]	-	-	26.6 [c,e]	25.6 [c,e]	16.1 [c,e,n]	17.5 [c,e,n]	-
Russian Federation	-	77.5	68.5	70.3	69.9	-	-	5.7 [h]	5.4	5.2	5.4	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991.
2. 1996 instead of 1995.
3. 2000 instead of 2001.
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5. 1983 instead of 1981.
6. 1982 instead of 1981.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/458542005788

Table 7. R&D expenditures by sector of performance, 1981-2003 (cont'd)

As a percentage of total national R&D expenditures

	Government						Private non-profit					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia[1, 2, 3]	45.1	28.1	23.5	22.9 [-]	-	-	1.3	1.6	2.1	2.7 [-]	-	-
Austria[4]	9.0	-	-	6.4	-	-	2.3	-	-	0.3	-	-
Belgium[5]	5.6 [a]	6.1 [b]	3.5	6.0	-	-	4.6 [a]	1.2 [b]	1.4	1.1	-	-
Canada	24.4	18.7	14.4	10.9	11.7 [n]	11.2 [n]	0.8	1.0	0.7	0.2	0.2 [n]	0.2 [n]
Czech Republic	-	29.0 [c,q]	26.5 [c,q]	23.7	23.0	-	-	-	0.1	0.5	0.3	-
Denmark	22.7	17.7	17.0	11.7	7.0 [a]	-	0.9	1.2	1.1	0.7	0.6	-
Finland	22.6 [a]	20.2 [a]	16.7	10.2	10.4	-	0.6 [a]	0.7 [a]	0.6	0.6	0.6	-
France	23.6 [a]	22.7	21.0	16.5	17.0 [n]	-	1.1 [a]	0.8	1.3	1.4	1.4 [n]	-
Germany	13.4	14.4 [a]	15.5 [b,m]	13.7 [m]	13.7 [b,m]	13.8 [b,m]	0.5	0.5 [b]	-	-	-	-
Greece	63.1 [a]	40.1	25.5 [a]	22.1 [b]	-	-	-	-	0.7 [a]	0.4 [b]	-	-
Hungary	-	24.5 [c,q,s]	25.6 [c,s]	25.9 [c,s]	32.9 [c,s]	-	-	-	-	-	-	-
Iceland	60.7	44.5	37.5	20.1	24.5 [b]	-	3.7	4.4	3.2	2.3	2.2 [b]	-
Ireland	39.3	11.6 [b]	9.0 [b]	7.9 [b]	-	-	1.1	1.7 [b]	0.8 [b]	-	-	-
Italy	25.7 [r]	22.7 [a]	21.1	18.4	-	-	-	-	-	-	-	-
Japan	12.0 [b,k]	8.1 [b,k]	10.4 [b,k]	9.5	9.5	-	4.5 [b,k]	4.4 [b,k]	4.8 [b,k]	2.3 [a]	2.1	-
Korea	-	-	17.0	12.4 [e]	13.4 [e]	-	-	-	1.2	1.1 [e]	1.3 [e]	-
Luxembourg[3]	-	-	-	7.1 [-]	-	-	-	-	-	-	-	-
Mexico	-	-	33.0	39.1	-	-	-	-	0.4	0.2	-	-
Netherlands	20.8	18.3	18.1	14.2	-	-	2.8	2.3 [a,m]	1.0	0.6	-	-
New Zealand	-	44.6	42.2	33.2 [a]	-	-	-	-	-	-	-	-
Norway	17.7	18.8	17.3 [a]	14.6	15.8	-	0.5	-	-	-	-	-
Poland	-	-	35.0 [a]	31.3	44.9	-	-	-	0.1	0.2	0.3	-
Portugal[6, 1]	43.6	22.1	27.0	20.8	19.8 [b]	-	4.6	13.2	15.0 [a]	10.8	10.2 [b]	-
Slovak Republic	-	21.5 [c,q]	40.2 [c]	23.7 [c]	26.6 [c]	-	-	-	-	0.0	0.0	-
Spain	31.6	21.3	18.6	15.9	15.4	-	-	0.5	1.1	0.8	0.2	-
Sweden	6.1 [a,f]	4.1 [f]	3.7 [a,f]	2.8 [f]	-	-	0.3 [a]	0.1	0.2 [a]	0.1	-	-
Switzerland[1, 2, 3]	5.9 [b]	3.7 [f]	2.5 [f]	1.3 [a,f]	-	-	3.2 [a,h]	1.2	2.5	1.9 [-]	-	-
Turkey[3]	-	7.9	7.4	6.2 [-]	-	-	-	-	-	-	-	-
United Kingdom	20.6 [a]	14.5 [a]	14.6	9.9 [a]	8.9	-	2.9 [a]	1.8	1.3	1.5	1.5	-
United States	12.5 [f]	9.8 [f]	9.4 [f]	7.9 [f]	8.8 [f,n]	9.1 [f,n]	3.1 [h]	3.3 [h]	3.6 [h]	4.7 [h]	5.1 [h,n]	5.3 [h,n]
Total OECD	**15.2** [b]	**12.4** [a,b]	**12.5** [a,b]	**10.5** [b]	**11.0** [b,n]	**-**	**2.6** [b]	**2.6** [a,b]	**2.7** [a,b]	**2.8** [b]	**2.9** [b,n]	**-**
EU-25	**-**	**-**	**16.8** [b]	**13.6** [b]	**13.7** [b,n]	**-**	**-**	**-**	**0.9** [b]	**0.9** [b]	**0.8** [b,n]	**-**
EU-15	**18.8** [b]	**16.9** [a,b]	**16.2** [b]	**13.1** [b]	**13.0** [b,n]	**-**	**1.4** [b]	**0.9** [a,b]	**0.9** [b]	**0.9** [b]	**0.8** [b,n]	**-**
China	-	49.6 [j,s]	42.1 [j,s]	29.7	28.7	-	-	-	-	-	-	-
Israel	-	10.8 [c]	9.9 [c]	5.2 [c,n]	5.8 [c,n]	-	-	6.9 [c]	5.8 [c]	3.4 [c,n]	3.8 [c,n]	-
Russian Federation	-	16.8	26.1	24.3	24.5	-	-	0.0 [h]	0.0	0.2	0.2	-

Times series notes:

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6. 1982 instead of 1981.

Source: OECD, MSTI database, May 2004.

Table 8. GERD by sector of performance, 1981-2003

As a percentage of GDP

	Business enterprise						Higher education					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia[1, 2, 3]	0.2 [b]	0.7	0.8	0.7	-	-	0.3	0.4	0.4	0.4	-	-
Austria[4]	0.6	-	-	1.1 [b, n]	-	-	0.4	-	-	0.5 [b,n]	-	-
Belgium[5]	1.1 [a,a]	1.1 [b]	1.2	1.6	-	-	0.3 [a]	0.4 [b]	0.4	0.4	-	-
Canada	0.6	0.8	1.0	1.2	1.1 [n]	1.0 [b, n]	0.3	0.5	0.5	0.6	0.6 [n]	0.7 [b,n]
Czech Republic	-	1.4 [c, q]	0.7 [c, q]	0.8	0.8	-	-	0.0 [c,q]	0.1 [c,q]	0.2	0.2	-
Denmark	0.5	1.0	1.1	1.6	1.7	-	0.3	0.4	0.5	0.5	0.6 [a]	-
Finland	0.6 [a]	1.2 [a]	1.4	2.4	2.4	-	0.3 [a]	0.5 [a]	0.4	0.6	0.7	-
France	1.1 [a]	1.5	1.4	1.4 [a]	1.4 [n]	-	0.3 [a]	0.4	0.4	0.4	0.4 [n]	-
Germany	1.7	1.7 [a,a]	1.5 [b]	1.8	1.7 [b]	1.7 [b]	0.4	0.4 [a]	0.4 [b]	0.4	0.4 [b]	0.4 [b]
Greece	0.0 [a]	0.1	0.1 [a]	0.2 [b]	-	-	0.0 [a]	0.1	0.2 [a]	0.3 [b]	-	-
Hungary	-	0.4 [c, q, s]	0.3 [a, c, s]	0.4 [c, s]	0.4 [c, s]	-	-	0.2 [c,q,s]	0.2 [a,c,s]	0.2 [c,s]	0.3 [c,s]	-
Iceland	0.1	0.3	0.5	1.8	1.8 [b]	-	0.2	0.3	0.4	0.6	0.5 [b]	-
Ireland	0.3	0.6 [b]	0.9 [b]	0.8 [b]	-	-	0.1	0.2 [b]	0.3 [b]	0.3 [b]	-	-
Italy	0.5 [r]	0.7 [a]	0.5	0.5	-	-	0.2 [r]	0.3 [a]	0.3	0.4	-	-
Japan	1.4 [b, j]	2.1 [b, j]	1.9 [b, j]	2.3	2.3	-	0.4 [b,j,k]	0.3 [b,j,k]	0.4 [b,j,k]	0.4	0.4	-
Korea	-	-	1.8 [e]	2.2 [e]	2.2 [e]	-	-	-	0.2 [e]	0.3 [e]	0.3 [e]	-
Luxembourg[3]	-	-	-	1.6	-	-	-	-	-	0.0	-	-
Mexico	-	-	0.1	0.1	-	-	-	-	0.1	0.1	-	-
Netherlands	1.0	1.0	1.0 [a]	1.1	-	-	0.4	0.6	0.6 [a]	0.5	-	-
New Zealand	-	0.3	0.3	0.4 [a]	-	-	-	0.3	0.3	0.4 [a]	-	-
Norway	0.6	0.9	1.0 [a]	1.0	1.0	-	0.3	0.4	0.4 [a]	0.4	0.4	-
Poland	-	-	0.3 [a]	0.2	0.1 [b]	-	-	-	0.2 [a]	0.2	0.2 [b]	-
Portugal[6, 1]	0.1	0.1	0.1 [a]	0.3	0.3 [b]	-	0.1	0.3	0.2 [a]	0.3	0.3 [b]	-
Slovak Republic	-	1.6 [c, q]	0.5 [c,c]	0.4 [j, k]	0.4 [j, k]	-	-	0.1 [c,q]	0.1 [c]	0.1 [j,k]	0.1 [j,k]	-
Spain	0.2	0.5	0.4 [a]	0.5	0.6 [a]	-	0.1	0.2	0.3 [a]	0.3 [b]	0.3	-
Sweden	1.4 [a, j, k]	1.9 [k]	2.5 [a, k]	3.3 [k]	-	-	0.7 [a,j,k]	0.7 [j,k]	0.7 [a,h,j,k]	0.8 [j,k]	-	-
Switzerland[1, 2, 3]	1.6 [b]	1.8	1.9	1.9	-	-	0.4 [b]	0.6	0.6	0.6	-	-
Turkey[3]	-	0.1	0.1	0.2	-	-	-	0.4	0.3	0.4	-	-
United Kingdom	1.5 [a]	1.4	1.3	1.2 [a]	1.3	-	0.3 [a]	0.3	0.4	0.4	0.4	-
United States	1.7 [h]	2.0 [h]	1.8 [h]	2.0 [h]	1.9 [h, n]	1.8 [b, h, n]	0.3 [h]	0.4 [h]	0.4 [h]	0.4 [h]	0.4 [h,n]	0.4 [h,n]
Total OECD	**1.3** [b]	**1.5** [a, b]	**1.4** [a, b]	**1.6** [b]	**1.5** [b, n]	**-**	**0.3** [b]	**0.4** [a,b]	**0.4** [a,b]	**0.4** [b]	**0.4** [b,n]	**-**
EU-25	**-**	**-**	**1.1** [b]	**1.2** [b]	**1.2** [b, n]	**-**	**-**	**-**	**0.4** [b]	**0.4** [b]	**-**	**-**
EU-15	**1.0** [b]	**1.2** [a, b]	**1.1** [b]	**1.2** [b]	**1.2** [b, n]	**-**	**0.3** [a,b]	**0.4** [a,b]	**0.4** [a,b]	**0.4** [b]	**-**	**-**
China	-	0.3 [k, s]	0.3 [k, s]	0.6	0.8	-	-	0.1 [j,k,s]	0.1 [j,k,s]	0.1	0.1	-
Israel	-	1.4 [c]	1.6 [c]	3.8 [c, n]	3.4 [c, n]	-	-	0.7 [c,e]	0.7 [c,e]	0.8 [c,e,n]	0.8 [c,e,n]	-
Russian Federation[1]	-	0.6	0.6	0.8	0.9	-	-	0.0 [h]	0.0	0.1	0.1	-

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Source: OECD, MSTI database, May 2004.

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Table 8. GERD by sector of performance, 1981-2003 (cont'd)

As a percentage of GDP

	Government						Private non-profit					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia[1, 2, 3]	0.4	0.4	0.4	0.4	-	-	0.0	0.0	0.0	0.0	-	-
Austria[4]	0.1	-	-	0.1 b,n	-	-	0.0	-	-	0.0	-	-
Belgium[5]	0.1 a	0.1 b	0.1	0.1	-	-	0.1 a	0.0 b	0.0	0.0	-	-
Canada	0.3	0.3	0.2	0.2	0.2 n	0.2 b,n	0.0	0.0	0.0	0.0	0.0 n	0.0 b,n
Czech Republic	-	0.6 c,q	0.3 c,q	0.3	0.3	-	-	-	-	0.0	0.0	-
Denmark	0.2	0.3	0.3	0.3	0.2 a	-	0.0	0.0	0.0	0.0	0.0	-
Finland	0.3 a	0.4 a	0.4	0.3	0.4	-	0.0 a	0.0 a	0.0	0.0	0.0	-
France	0.5 a	0.5	0.5	0.4	0.4 n	-	0.0 a	0.0	0.0	0.0	0.0 n	-
Germany	0.3	0.4 a	0.3 b,m	0.3 m	0.3 b,m	0.3 b,m	0.0	-	-	-	-	-
Greece	0.1 a	0.1	0.1 a	0.1 b	-	-	-	-	0.0 a	0.0 b	-	-
Hungary	-	0.3 c,q,s	0.2 a,c,s	0.2 c,s	0.3 c,s	-	-	-	-	-	-	-
Iceland	0.4	0.5	0.6	0.6	0.8 b	-	0.0	0.1	0.0	0.1	0.1 b	-
Ireland	0.3	0.1 b	0.1 b	0.1 b	-	-	0.0	0.0 b	0.0 b	-	-	-
Italy	0.2 r	0.3 a	0.2	0.2	-	-	-	-	-	-	-	-
Japan	0.3 b,j,k	0.2 b,j,k	0.3 b,j,k	0.3	0.3	-	0.1 b,j,k	0.1 b,j,k	0.1 b,j,k	0.1 a	0.1	-
Korea	-	-	0.4 e	0.4 e	0.4 e	-	-	-	0.0 e	0.0 e	0.0 e	-
Luxembourg[3]	-	-	-	0.1	-	-	-	-	-	-	-	-
Mexico	-	-	0.1	0.2	-	-	-	-	0.0	0.0	-	-
Netherlands	0.4	0.4	0.4 a	0.3	-	-	0.0	0.0 a,m	0.0 a	0.0	-	-
New Zealand	-	0.4	0.4	0.4 a	-	-	-	-	-	-	-	-
Norway	0.2	0.3	0.3 a	0.2	0.3	-	0.0	-	-	-	-	-
Poland	-	-	0.2 a	0.2	0.3 b	-	-	-	-	0.0	0.0 b	-
Portugal[6, 1]	0.1	0.1	0.2 a	0.2	0.2 b	-	0.0	0.1	0.1 a	0.1	0.1 b	-
Slovak Republic	-	0.5 c,q	0.4 c	0.2 k,c	0.2 k,c	-	-	-	-	-	0.0 k	-
Spain	0.1	0.2	0.2 a	0.2	0.2	-	-	0.0	0.0 a	0.0	0.0	-
Sweden	0.1 a,f,k	0.1 f,k	0.1 a,f,k	0.1 f,k	-	-	0.0 a,k	0.0 k	0.0 a,k	0.0 k	-	-
Switzerland[1, 2, 3]	0.1 b	0.1 f	0.1 f	0.0 a,f	-	-	-	0.0	0.1	0.0	-	-
Turkey[3]	-	0.0	0.0	0.0	-	-	-	-	-	-	-	-
United Kingdom	0.5 a	0.3 a	0.3	0.2 a	0.2	-	0.1 a	0.0	0.0	0.0	0.0	-
United States	0.3 f,h	0.3 f,h	0.2 f,h	0.2 f,h	0.2 f,h,n	0.2 b,f,h,n	0.1 h	0.1 h	0.1 h	0.1 h	0.1 h,n	0.1 h,n
Total OECD	**0.3 b**	**0.3 a,b**	**0.3 a,b**	**0.2 b**	**0.2 b,n**	**-**	**0.1 b**	**0.1 a,b**	**0.1 a,b**	**0.1 b**	**0.1 b,n**	**-**
EU-25	**-**	**-**	**0.3 b**	**0.2 b**	**0.3 b,n**	**-**	**-**	**-**	**0.0 b**	**0.0 b**	**0.0 b,n**	**-**
EU-15	**0.3 b**	**0.3 a,b**	**0.3 b**	**0.3 b**	**0.3 b,n**	**-**	**0.0 b**	**0.0 a,b**	**0.0 b**	**0.0 b**	**0.0 b,n**	**-**
China	-	0.4 j,k,s	0.3 j,k,s	0.3	0.4	-	-	-	-	-	-	-
Israel	-	0.3 c	0.3 c	0.3 c,n	0.3 c,n	-	-	0.2 c	0.2 c	0.2 c,n	0.2 c,n	-
Russian Federatior	-	0.1	0.2	0.3	0.3	-	-	0.0 h	0.0	0.0	0.0	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991.
2. 1996 instead of 1995.
3. 2000 instead of 2001.
4. 1998 instead of 2001.
5. 1983 instead of 1981.
6. 1982 instead of 1981.

Source: OECD, MSTI database, May 2004.

Table 9. Business R&D expenditures, 1981-2003

	Millions constant USD (1995 PPPs)							As a percentage of total OECD					
	1981	1985	1991	1995	2001	2002	2003	1981	1985	1991	1995	2001	2002
Australia	591 [b]	1 067 [b]	1 896	3 306	3 718	-	-	0.4	0.5	0.7	1.1	0.9	-
Austria[1]	814	949 [b]	-	-	2 214	-	-	0.5	0.4	-	-	0.6	-
Belgium	1 664	2 020	2 228 [b]	2 681	4 042	4 170 [n]	-	1.0	0.9	0.8	0.9	1.0	1.1
Canada	2 811	3 958	4 660	6 536	9 850	8 875 [n]	8 630 [b,n]	1.7	1.7	1.6	2.2	2.5	2.3
Czech Republic	-	-	1 613 [c,q]	818 [a]	1 066	1 100	-	-	-	0.6	0.3	0.3	0.3
Denmark	470	671	1 038	1 239	2 248	2 404	-	0.3	0.3	0.4	0.4	0.6	0.6
Finland	494	797	1 105	1 402	3 001	3 056	-	0.3	0.4	0.4	0.5	0.8	0.8
France	10 528	12 974	17 191	17 356	20 217 [a]	19 853 [n]	-	6.2	5.7	6.0	5.9	5.1	5.1
Germany	19 239	23 586	29 116 [a]	26 122	33 897	33 934 [b]	33 464 [b]	11.4	10.4	10.2	8.9	8.6	8.7
Greece[2]	46	95	126	198	361 [b]	-	-	0.0	0.0	0.0	0.1	0.1	-
Hungary	-	-	406 [q]	297	447	443	-	-	-	0.1	0.1	0.1	0.1
Iceland	3	6	15	29	139	136 [b]	-	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	109	160	310	575	873	-	-	0.1	0.1	0.1	0.2	0.2	-
Italy	4 461 [r]	6 199 [r]	7 746 [a]	6 351	7 278	7 221 [n]	7 313 [n]	2.6	2.7	2.7	2.2	1.8	1.8
Japan	25 562 [j]	37 894 [j]	56 098 [j]	53 174 [j]	68 522	70 103	-	15.2	16.7	19.7	18.0	17.4	17.9
Korea	-	-	-	9 525	15 024	15 621	-	-	-	-	3.2	3.8	4.0
Luxembourg[3]	-	-	-	-	294 [-]	-	-	-	-	-	0.1	-	-
Mexico	-	-	543 [b,j,q]	402	968	-	-	-	-	0.2	0.1	0.2	-
Netherlands	2 292	2 866	3 018	3 466	4 468	4 203 [n]	-	1.4	1.3	1.1	1.2	1.1	1.1
New Zealand	-	-	141	164	319 [a]	-	-	-	-	0.0	0.1	0.1	-
Norway	495	834	825	1 001 [a]	1 372	1 354 [b]	-	0.3	0.4	0.3	0.3	0.3	0.3
Poland	-	-	-	728 [a]	863	480	-	-	-	-	0.2	0.2	0.1
Portugal[4, 2, 5]	85	95	169	157 [a]	436	521 [b]	-	0.0	0.0	0.1	0.1	0.1	0.1
Slovak Republic	-	-	648 [b,c,q]	219 [c]	233	210	-	-	-	0.2	0.1	0.1	0.1
Spain	798	1 351	2 768	2 416	3 830	4 416 [a]	-	0.5	0.6	1.0	0.8	1.0	1.1
Sweden	2 058 [a]	3 024	3 344 [k]	4 673 [a,k]	7 376 [k]	-	-	1.2	1.3	1.2	1.6	1.9	-
Switzerland[2, 5, 6, 3]	2 399 [b]	3 482 [a]	3 321	3 513	3 884 [-]	-	-	1.4	1.5	1.2	1.1	1.0	-
Turkey[2]	-	-	324	303	879 [-]	-	-	-	-	0.1	0.1	0.2	-
United Kingdom	12 089	13 045	14 533	14 615	17 053 [a]	17 564	-	7.2	5.7	5.1	5.0	4.3	4.5
United States	81 589 [h]	112 257 [h]	127 965 [h]	132 109 [h]	179 673 [h]	172 371 [h,n]	170 945 [b,h,n]	48.4	49.4	44.9	44.8	45.5	44.1
Total OECD	**168 685** [b]	**227 013** [b]	**284 999** [a,b]	**294 874** [a,b]	**394 706** [b]	**390 610** [b,n]	**-**	**100**	**100**	**100**	**100**	**100**	**100**
EU-25	**-**	**-**	**-**	**85 141** [b]	**110 640** [b]	**111 945** [b,n]	**-**	**-**	**-**	**-**	**28.9**	**28.0**	**28.7**
EU-15	**55 136** [b]	**67 794** [b]	**84 074** [a,b]	**82 839** [b]	**107 593** [b]	**109 291** [b,n]	**-**	**32.7**	**29.9**	**29.5**	**28.1**	**27.3**	**28.0**
China	-	-	5 505 [k,s]	7 871 [k,s]	31 668	40 066	-	-	-	1.9	2.7	8.0	10.3
Israel	-	-	1 079 [c]	1 544 [c]	4 470 [c,n]	4 024 [c,n]	3 916 [c,n]	-	-	0.4	0.5	1.1	1.0
Russian Federation[5]	-	-	7 532	5 121	8 628	9 539	-	-	-	2.7	1.7	2.2	2.4

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1998 instead of 2001. 2. 1986 instead of 1985. 3. 2000 instead of 2001. 4. 1982 instead of 1981. 5. 1992 instead of 1991. 6. 1996 instead of 1995.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/730082336242

Table 10. BERD intensity, 1981-2003

As a percentage of value added in industry

	1981	1985	1991	1995	2000	2001	2002	2003
Australia	0.3 b	0.5 b	0.8	1.2	1.0	1.1	-	-
Austria[1]	0.9	1.0 b	-	-	1.6 -	-	-	-
Belgium	1.5	1.7	1.6 b	1.8	2.2	2.4	2.5 n	-
Canada	0.8	1.0	1.1	1.4	1.5	1.6 b	1.4 b,n	1.4 b,n
Czech Republic	-	-	1.8 c,q	0.9 a	1.1	1.0	1.1	-
Denmark[2]	0.9	1.1	1.5	1.7	2.3	2.6	2.8	-
Finland	0.9	1.3	1.8	2.2	3.5	3.6	3.6	-
France	1.6	1.9	2.1	2.1	2.0	2.1 a	2.0 n	-
Germany	2.3	2.7	2.5 a	2.1	2.5 b	2.5	2.5 b	2.5 b
Greece[3, 2]	0.0	0.1	0.1	0.2	0.3	0.3 b	-	-
Hungary	-	-	0.6 q	0.5	0.5	0.6	0.6 b	-
Iceland	0.1	0.2	0.4	0.8	2.5 b	2.8 b	2.8 b	-
Ireland	0.4	0.5	0.8	1.3	1.1 b	1.1	-	-
Italy	0.6 r	0.8 r	1.0 a	0.7	0.8	0.8	0.8 n	0.8 n
Japan	1.7 j	2.3 j	2.6 j	2.4 j	2.8	3.0	3.1 b	-
Korea	-	-	-	2.2	2.4	2.8	2.7	-
Luxembourg	-	-	-	-	2.2	-	-	-
Mexico	-	-	0.1 b,j,q	0.1	0.2	0.2	-	-
Netherlands	1.4	1.6	1.4	1.5	1.6	1.6	1.6 n	-
New Zealand[2]	-	-	0.4	0.3	0.4 b	0.6 a,b	-	-
Norway[2]	0.9	1.3	1.3	1.5 a	1.4	1.4	1.4	-
Poland	-	-	-	0.4 a	0.3	0.3	0.2 b	-
Portugal[4, 3, 5]	0.1	0.1	0.2	0.2 a	0.4 b	0.4	0.5 b	-
Slovak Republic	-	-	-	0.7 c	0.6	0.6	0.5	-
Spain	0.2	0.4	0.6	0.5	0.7	0.7	0.8 a	-
Sweden[2]	2.2 a	2.9	3.0 k	3.8 a,k	4.3 k	5.2 k	-	-
Switzerland[3, 5, 6]	1.6 b	2.6 a,b	2.9 b	3.1 b	3.1	-	-	-
Turkey	-	-	0.1	0.1	0.3	-	-	-
United Kingdom	2.1	2.0	2.0	1.8	1.8	1.8 a	1.9	-
United States	2.2 h	2.8 h	2.8 h	2.5 h	2.8 h	2.7 h	2.6 b,h,n	2.5 b,h,n
Total OECD	**1.7 b**	**2.1 b**	**2.1 a,b**	**2.0 a,b**	**2.2 b**	**2.2 b**	**2.1 b,n**	**-**
EU-25	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
EU-15	**1.4 b**	**1.7 b**	**1.7 a,b**	**1.6 b**	**1.8 b**	**1.8 b**	**1.8 b,n**	**-**
China	-	-	0.3 k,s	0.3 k,s	0.7 a	0.7	0.9 b	-
Israel	-	-	-	2.5 c	5.4 c	6.0 c,n	5.4 b,c,n	5.1 b,c,n
Russian Federatior	-	-	0.6	0.7	1.0 b	1.1	1.1 b	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1998 instead of 2000.
2. 1999 instead of 2000.
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5. 1992 instead of 1991.
6. 1996 instead of 1995.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/754616431240

Table 11. Business R&D expenditures by source of funds, 1981-2003

As a percentage of total national R&D expenditures

	Industry						Government					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia	75.5 b,p	92.7	92.9	88.7	-	-	8.4 b,p	3.0	2.4	5.1	-	-
Austria[1]	88.4	-	-	64.4	-	-	7.4	-	-	5.5	-	-
Belgium	91.5 a	91.4 b	89.2	82.7	83.9 n	-	8.3 a	7.8 b	4.3	5.7	5.9 n	-
Canada	81.9	71.6	74.3	75.9	75.9 n	75.9 n	10.7	9.9	6.2	3.2	3.2 n	3.2 n
Czech Republic	-	-	92.2	84.3	84.0	-	-	6.6 c,q	4.5 c,q	12.2	12.1	-
Denmark	84.4 a	86.0	76.9	87.4	-	-	12.4	7.9	6.1	3.1	-	-
Finland	94.9 a	93.3	89.1	95.6	95.7	-	4.2 a	5.5	5.6	3.4	3.2	-
France	68.2	66.2	76.1	82.9 a	-	-	24.6	22.3	12.7	8.4 a	-	-
Germany	81.7	87.0 a	87.5	90.7	91.2 b	91.0 b	16.9	10.1 a	10.2	6.7	6.2 b	6.4 b
Greece	95.4	74.0	76.1	80.2 b	-	-	4.6	5.5	7.4	2.3 b	-	-
Hungary	-	87.0 q,s	78.3 s	75.7 s	69.4 s	-	-	8.2 q,s	16.2 s	6.1 s	7.2 s	-
Iceland	53.3	84.5	95.5	73.1	-	-	38.3	9.6	3.3	1.4	-	-
Ireland	80.5	89.6	98.2 p	92.8	-	-	13.7	3.7	4.9 p	2.7	-	-
Italy	86.9 r	77.2 a	75.2	78.2	78.0 n	78.2 n	8.8 r	13.2 a	16.7	14.9	15.0 n	14.4 n
Japan	97.9	98.4	98.2	97.8	97.9	-	1.9	1.4	1.6	0.8	1.0	-
Korea	-	-	96.3	91.2	93.0	-	-	-	3.6	8.1	6.4	-
Luxembourg[2]	-	-	-	97.8 -	-	-	-	-	-	1.6 -	-	-
Mexico	-	100.0 b,q	76.2	89.8	-	-	-	0.0 b,k,q	2.8	9.6	-	-
Netherlands	84.3	89.6	80.0	80.3	-	-	7.5	7.5	6.6	5.2	-	-
New Zealand	-	87.8	86.4	78.8 a	-	-	-	7.2	6.9	8.6 a	-	-
Norway	73.0	76.8	82.5 a	81.4	-	-	25.3	15.9	11.9 a	10.3	-	-
Poland	-	-	64.7 a	67.6	86.5	-	-	-	33.8 a	30.4	11.8	-
Portugal[3, 4]	92.9	80.5	78.6 a	94.4	-	-	1.6	9.1	5.1 a	2.1	-	-
Slovak Republic	-	88.6 c,q	87.7 c	78.3	77.5	-	-	11.4 c,q	10.8 c	20.6	21.1	-
Spain	93.6	80.4	84.4	82.5	84.0 a	-	4.1	11.3	9.2	9.5	9.6 a	-
Sweden	84.6 a	88.0	86.8 a	91.2	-	-	13.6 a	10.3	9.5 a	5.8	-	-
Switzerland[4, 5, 2]	98.7 b	95.5	92.5	91.4 -	-	-	1.3 b	1.7 f	2.4 f	2.3 f	-	-
Turkey[2]	-	99.9	91.3	92.4 -	-	-	-	0.0	1.7	4.3 -	-	-
United Kingdom	61.3	69.4	70.5	66.6 a	66.0	-	30.0	14.6	10.5	8.9 a	6.8	-
United States	68.4 h	77.4 h	82.2 h	90.6 h	90.1 h,n	90.0 h,n	31.6	22.6	17.8	9.4	9.9 n	10.0 n
Total OECD	**76.1** b	**82.6** a,b	**85.1** a,b	**89.2** b	**89.2** b,n	**-**	**22.3** b	**14.7** a,b	**11.7** a,b	**7.2** b	**7.1** b,n	**-**
EU-25	**-**	**-**	**80.5** b	**82.6** b	**-**	**-**	**-**	**-**	**10.8** b	**7.9** b	**-**	**-**
EU-15	**76.1** b	**78.9** a,b	**80.5** b	**82.8** b	**-**	**-**	**19.3** b	**13.4** a,b	**10.7** b	**7.7** b	**-**	**-**
China[2]	-	-	-	86.4 a,s	-	-	-	-	-	6.8 a,s	-	-
Israel[2]	-	74.2 c	78.6 c	90.4 c,n	-	-	-	25.8 c	21.3 c	9.6 c	-	-
Russian Federation	-	-	43.7	41.5	40.9	-	-	-	51.1	49.0	50.6	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

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4. 1992 instead of 1991.
5. 1996 instead of 1995.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/250760635132

Table 11. Business R&D expenditures by source of funds, 1981-2003 (cont'd)

As a percentage of total national R&D expenditures

	Other national sources						Abroad					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia	0.3 [b,p]	0.3	1.7	0.7	-	-	1.6 [b,p]	4.1	3.1	5.6	-	-
Austria[1]	0.1	-	-	0.1	-	-	4.1	-	-	30.1	-	-
Belgium	0.0 [a]	0.0 [b]	0.4	0.1	0.1 [n]	-	0.2 [a]	0.9 [b]	6.1	11.5	10.3 [n]	-
Canada	0.0	0.0	0.0	0.0	0.0 [n]	0.0 [n]	7.4	18.5	19.5	21.0	21.0 [n]	21.0 [n]
Czech Republic	-	-	0.2	1.6	1.6	-	-	-	3.2	1.9	2.3	-
Denmark	0.5 [a]	1.7	1.5	0.3	-	-	2.8	4.4	15.5	9.2	-	-
Finland	0.0	0.1	0.1	0.3	0.1	-	0.9	1.2	5.3	0.7	1.0	-
France	0.1	0.1	0.0	0.0 [a]	-	-	7.1	11.4	11.1	8.7 [a]	-	-
Germany	0.2	0.3 [a]	0.1	0.2	0.2 [b]	0.2 [b]	1.2	2.6 [a]	2.2	2.4	2.4 [b]	2.4 [b]
Greece	-	-	0.0	0.0 [b]	-	-	-	20.6	16.5	17.5 [b]	-	-
Hungary	-	-	-	0.1 [s]	0.1 [s]	-	-	2.8 [q,s]	4.1 [s]	16.9 [s]	22.6 [s]	-
Iceland	0.0	0.0	0.0	0.2	-	-	8.4	5.9	1.2	25.3	-	-
Ireland	0.1	0.2	0.5 [p]	-	-	-	5.7	6.6	3.8 [p]	4.5	-	-
Italy	0.0 [r]	-	-	0.3	0.3 [n]	0.3 [n]	4.3 [r]	9.6 [a]	8.2	6.6	6.8 [n]	7.1 [n]
Japan	0.0	0.1	0.1	0.8	0.6	-	0.1	0.1	0.1	0.5	0.5	-
Korea	-	-	0.2	0.2	0.1	-	-	-	0.0	0.6	0.5	-
Luxembourg[2]	-	-	-	-	-	-	-	-	-	0.6 [-]	-	-
Mexico	-	-	0.4	0.0	-	-	-	-	20.7	0.6	-	-
Netherlands	0.0	0.6	0.1	0.1	-	-	8.2	2.4	13.2	14.4	-	-
New Zealand	-	0.2	1.0	0.9 [a]	-	-	-	4.9	5.7	11.8 [a]	-	-
Norway	0.0	0.1	0.1 [a]	0.0	-	-	1.7	7.2	5.6 [a]	8.4	-	-
Poland	-	-	0.2 [a]	0.2	0.3	-	-	-	1.3 [a]	1.8	1.4	-
Portugal[3, 4]	0.0	- [-]	0.3 [a]	-	-	-	5.5	10.4	16.1 [a]	3.6	2.9 [b]	-
Slovak Republic	-	-	0.0 [c]	0.0	0.3	-	-	-	1.6 [c]	1.1	1.2	-
Spain	0.1	0.2	0.1	0.3	0.5 [a]	-	2.2	8.1	6.4	7.8	5.9 [a]	-
Sweden	0.0 [a]	0.2	0.1 [a]	0.1	-	-	1.8 [a]	1.6	3.7 [a,j]	2.9	-	-
Switzerland[4, 5, 2]	-	0.2	0.7	0.5 [-]	-	-	-	2.7	4.4	5.8 [-]	-	-
Turkey[2]	-	-	1.4	1.4 [-]	-	-	-	0.1	5.6	1.9 [-]	-	-
United Kingdom	-	-	0.0	0.0 [a]	0.0	-	8.7	16.0	19.1	24.4 [a]	27.2	-
United States	0.0	0.0	0.0	0.0	0.0 [n]	0.0 [n]	-	-	-	-	-	-
Total OECD	**0.1** [b]	**0.1** [a,b]	**0.1** [a,b]	**0.2** [b]	**0.2** [b,n]	**-**	**-**	**-**	**-**	**-**	**-**	**-**
EU-25	**-**	**-**	**0.1** [b]	**0.2** [b]	**0.1** [b,n]	**-**	**-**	**-**	**8.6** [b]	**9.2** [b]	**-**	**-**
EU-15	**0.1** [b]	**0.2** [a,b]	**0.1** [b]	**0.1** [b]	**0.1** [b,n]	**-**	**4.6** [b]	**7.5** [a,b]	**8.8** [b]	**9.3** [b]	**-**	**-**
China[2]	-	-	-	-	-	-	-	-	-	4.0 [a,s]	-	-
Israel[2]	-	0.0 [c]	0.1 [c]	0.0 [c]	-	-	-	0.0 [c]	0.0 [c]	0.0 [c]	-	-
Russian Federation	-	-	0.0	0.3	0.1	-	-	-	5.1	9.2	8.4	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1998 instead of 2001.
2. 2000 instead of 2001.
3. 1982 instead of 1981.
4. 1992 instead of 1991.
5. 1996 instead of 1995.

Source: OECD, MSTI database, May 2004.

Table 12. Business R&D expenditures, by two main sources of funds, 1981-2003

As a percentage of GDP

	Industry						Government					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia	0.18 [b,p]	0.54	0.81	0.69	-	-	0.02 [b,p]	0.02	0.02	0.04	-	-
Austria[1]	0.56	-	-	0.73	-	-	0.05	-	-	0.06	-	-
Belgium	0.92 [a]	0.99 [b]	1.09	1.32	1.38 [n]	-	0.08 [a]	0.08 [b]	0.05	0.09	0.10 [n]	-
Canada	0.49	0.57	0.74	0.92	0.80 [n]	0.77 [b,n]	0.06	0.08	0.06	0.04	0.03 [n]	0.03 [b,n]
Czech Republic	-	- [c,q]	0.61 [c,q]	0.66	0.66	-	-	0.09 [c,q]	0.03 [c,q]	0.10	0.10	-
Denmark	0.45 [a]	0.83	0.81	1.44	-	-	0.07	0.08	0.06	0.05	-	-
Finland	0.61 [a]	1.08	1.28	2.31	2.31	-	0.03 [a]	0.06	0.08	0.08	0.08	-
France	0.78	0.97	1.07	1.17 [a]	-	-	0.28	0.33	0.18	0.12 [a]	-	-
Germany	1.36	1.52 [a]	1.30	1.59	1.60 [b]	1.57 [b]	0.28	0.18 [a]	0.15	0.12	0.11 [b]	0.11 [b]
Greece	0.04	0.07	0.11 [a]	0.17 [b]	-	-	0.00	0.00	0.01 [a]	0.00 [b]	-	-
Hungary	-	0.38 [q,s]	0.25 [a,s]	0.29 [s]	0.25 [s]	-	-	0.04 [r,s]	0.05 [a,s]	0.02 [s]	0.03 [s]	-
Iceland	0.03	0.22	0.48	1.32	- [b]	-	0.02	0.02	0.02	0.03	-	-
Ireland	0.23	0.53	0.87 [p]	0.74	-	-	0.04	0.02	0.04 [p]	0.02	-	-
Italy	0.43 [r]	0.52 [a]	0.40	0.43	0.42 [n]	0.43 [n]	0.04 [r]	0.09 [a]	0.09	0.08	0.08 [n]	0.08 [n]
Japan	1.37 [j]	2.05 [j]	1.86 [j]	2.21	2.27	-	0.03 [j]	0.03 [j]	0.03 [j]	0.02	0.02	-
Korea	-	-	1.77	2.03	2.03	-	-	-	0.07	0.18	0.14	-
Luxembourg[2]	-	-	-	1.56 [-]	-	-	-	-	-	0.02 [-]	-	-
Mexico	-	0.09 [b,j,q]	0.05	0.11	-	-	-	-	0.00	0.01	-	-
Netherlands	0.80	0.88	0.83 [a]	0.88	-	-	0.07	0.07	0.07 [a]	0.06	-	-
New Zealand	-	0.23	0.22	0.34 [a]	-	-	-	0.02	0.02	0.04 [a]	-	-
Norway	0.45	0.68	0.79 [a]	0.78	-	-	0.16	0.14	0.11 [a]	0.10	-	-
Poland	-	-	0.16 [a]	0.16	0.11 [b]	-	-	-	0.08 [a]	0.07	0.02 [b]	-
Portugal[3, 4]	0.08	0.10	0.09 [a]	0.25	-	-	0.00	0.01	0.01 [a]	0.01	-	-
Slovak Republic	-	1.41 [c,q]	0.44 [c]	0.34	0.29	-	-	0.18 [c,q]	0.05 [c]	0.09	0.08	-
Spain	0.18	0.38	0.33 [a]	0.41	0.47 [a]	-	0.01	0.05	0.04 [a]	0.05	0.05 [a]	-
Sweden	1.19 [a]	1.65 [k]	2.16 [a,k]	3.03 [k]	-	-	0.19 [a]	0.19 [k]	0.24 [a,k]	0.19 [k]	-	-
Switzerland[4, 5, 2]	1.55 [b]	1.74	1.75	1.74 [-]	-	-	0.02 [b]	0.03 [f]	0.05 [f]	0.04 [f]	-	-
Turkey[2]	-	0.11	0.08	0.19 [-]	-	-	-	0.00	0.00	0.01 [-]	-	-
United Kingdom	0.92	0.96	0.89	0.83 [a]	0.83	-	0.45	0.20	0.13	0.11 [a]	0.09	-
United States	1.14 [h]	1.53 [h]	1.48 [h]	1.81 [h]	1.68 [h,n]	1.63 [b,h,n]	0.53 [h]	0.44 [h]	0.32 [h]	0.19 [h]	0.19 [h,n]	0.18 [b,h]
Total OECD	**0.97** [b]	**1.26** [a,b]	**1.19** [a,b]	**1.41** [b]	**1.37** [b,n]	**-**	**0.28** [b]	**0.22** [a,b]	**0.16** [a,b]	**0.11** [b]	**0.11** [b,n]	**-**
EU-25	**-**	**-**	**0.85** [b]	**0.97** [b]	**-**	**-**	**-**	**-**	**0.11** [b]	**0.09** [b]	**-**	**-**
EU-15	**0.79** [b]	**0.95** [a,b]	**0.90** [b]	**1.03** [b]	**-**	**-**	**0.20** [b]	**0.16** [a,b]	**0.12** [b]	**0.10** [b]	**-**	**-**
China[2]	-	-	-	0.52 [a,s]	-	-	-	-	-	0.04 [a,s]	-	-
Israel[2]	-	1.03 [c]	1.27 [c]	3.22 [c,n]	-	-	-	0.36 [c]	0.34 [c]	0.34 [c]	-	-
Russian Federation	-	-	0.25	0.34	0.36	-	-	-	0.30	0.40	0.44	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1998 instead of 2001.
2. 2000 instead of 2001.
3. 1982 instead of 1981.
4. 1992 instead of 1991.
5. 1996 instead of 1995.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/348312071533

Table 13. Intensity in business R&D expenditures by sector, 1991 and 2001 or nearest years available

As a percentage of value added in industry

		Australia		Belgium		Canada		Czech Republic		Denmark		Finland		France		Germany		Ireland		Italy	
		1991	2000	1992	2001	1991	2000	1992	2001	1991	1999	1991	2001	1991	2000	1991	2001	1991	1999	1991	2001
Total manufacturing	**(15-37)**	**2.9**	**3.3**	**5.2**	**7.7**	**3.6**	**4.1**	**2.8**	**2.1**	**4.4**	**6.0**	**5.6**	**9.4**	**7.2**	**6.9**	**6.5**	**7.7**	**2.1**	**2.2**	**2.9**	**2.4**
Food prod., beverages and tobacco	(15-37)	1.0	1.0 [1]	1.4	1.7	0.4	0.4	0.3	0.1 [1]	1.5	1.5	3.1	2.3	1.0	1.2	0.7	0.7	1.2	1.0	0.3	0.4
Textiles, textile prod., leather and footwear	(17-19)	0.3	0.8 [1]	1.2	3.6	1.1	1.1	2.5	0.4 [1]	0.5	0.8	1.8	2.6	0.5	1.0	1.1	2.3	1.3	1.0	0.0	0.1
Wood, pulp, paper, paper prod., printing & publishing	(20-22)	0.6	0.8 [1]	0.8	1.1	0.7	0.4	0.4	0.0 [1]	0.3	0.3	2.4	1.3	0.3	0.3	0.4	0.3	0.2	0.2	0.0	0.1
Chemical, rubber, plastics and fuel prod.	(23-25)	3.8	4.4 [1]	10.2	14.0	3.8	4.0	3.6	2.6 [1]	10.3	17.5	9.3	12.2	9.8	9.4	9.0	10.1	2.6	1.3	4.9	3.5
Coke, refined petroleum prod. and nuclear fuel	(23)	0.9	1.1 [1]	7.3	2.9	5.8	1.6	3.7	0.3 [1]	0.0	0.0	4.9	5.8	5.6	2.4	2.7	0.8	-	-	2.0	1.9
Chemicals and chemical prod.	(24)	5.7	6.9 [1]	12.0	17.8	4.5	6.6	3.4	4.2 [1]	15.7	23.7	13.8	17.6	14.1	13.9	12.6	15.0	2.8	1.2	7.3	4.8
….Chemicals excluding pharmaceuticals	(24ex2423)	-	-	10.3	-	2.4	2.1	-	2.9 [1]	4.4	8.1	11.6	7.0	10.7	7.1	11.4	12.1	1.1	0.4	4.4	3.2
….Pharmaceuticals	(2423)	-	-	18.6	-	11.4	23.9	-	10.3 [1]	28.2	33.6	20.5	63.7	22.1	26.3	18.3	24.1	10.5	4.5	12.0	7.0
Rubber and plastics prod.	(25)	2.2	1.5 [1]	4.3	4.4	0.6	0.8	3.8	1.1 [1]	1.0	4.4	4.1	6.0	3.7	5.1	2.2	3.4	1.2	2.6	1.5	1.3
Other non-metallic mineral prod.	(26)	1.2	0.8 [1]	1.7	2.9	0.5	0.2	0.7	0.6 [1]	2.1	1.2	2.0	1.7	1.7	2.4	1.9	2.2	1.1	1.1	0.2	0.3
Basic metals and fabricated metal prod.	(27-28)	2.5	2.2 [1]	2.2	3.3	1.9	1.1	2.5	1.0 [1]	1.6	1.0	3.8	3.6	1.7	1.4	1.3	1.5	1.3	1.4	0.8	0.3
Machinery and equipment	(29-33)	9.3	9.6 [1]	12.6	16.5	13.1	17.7	5.0	2.2 [1]	8.3	9.5	12.6	19.8	13.5	12.9	8.7	9.4	4.5	6.0	5.2	4.7
Machinery and equipment, n.e.c.	(29)	3.8	5.1 [1]	5.4	6.5	1.6	2.1	3.8	2.8 [1]	5.4	7.1	5.7	7.3	4.2	5.3	5.4	6.3	2.0	3.6	1.6	1.8
Electrical and optical equipment	(30-33)	14.9	13.6 [1]	18.4	24.7	22.0	30.5	7.2	1.8 [1]	12.9	12.4	22.8	25.9	19.8	17.5	11.7	13.0	5.1	6.3	9.1	8.5
….Office, accounting and computing machinery	(30)	-	-	-	-	61.4	38.1	-87.5	0.5 [1]	14.2	13.9	11.1	23.4	16.1	13.4	13.1	22.0	2.3	1.7	43.5	9.8
….Electrical machinery and apparatus, nec	(31)	-	-	-	-	2.2	5.6	2.9	1.2 [1]	4.8	8.1	9.4	14.6	5.8	6.8	6.1	3.8	3.8	6.4	4.1	2.4
….Radio, television and communication equip.	(32)	-	-	-	-	26.5	36.4	28.5	3.3 [1]	19.5	13.0	46.5	30.2	25.3	33.2	27.5	45.4	23.5	14.1	18.3	21.0
….Medical, precision and optical instruments	(33)	-	-	-	-	-	-	10.3	1.9 [1]	16.5	15.6	20.6	11.0	34.9	16.5	12.5	10.9	2.0	4.2	1.7	5.5
Transport equipment	(34-35)	6.2	6.7 [1]	2.7	4.8	5.4	3.8	6.8	10.3 [1]	2.0	6.4	5.4	4.4	26.1	17.1	16.0	18.0	3.0	3.1	16.4	12.1
Motor vehicles, trailers and semi-trailers	(34)	5.8	8.1 [1]	-	-	0.9	1.4	4.0	10.7 [1]	-	-	5.7	3.7	13.2	13.8	13.1	18.4	6.9	5.9	15.5	12.1
Other transport equipment	(35)	7.4	4.0 [1]	-	-	15.5	10.7	31.3	8.4 [1]	3.1	9.9	5.1	4.8	61.3	24.8	32.3	15.7	0.4	1.4	18.0	12.0
….Building and repairing of ships and boats	(351)	-	-	-	-	-	-	-	0.0 [1]	2.6	13.2	2.7	2.1	1.1	1.9	4.2	1.5	0.0	3.1	2.3	0.9
….Aircraft and spacecraft	(353)	-	-	-	-	23.7	14.0	-	18.5 [1]	-	-	0.9	8.1	112.0	32.5	51.2	20.2	-	-	32.5	24.3
….Railroad equip. and transport equip. n.e.c.	(352+359)	-	-	-	-	-	-	-	3.4 [1]	5.4	0.6	17.4	16.9	8.4	6.6	14.7	9.9	0.4	0.0	6.3	4.0
Manufacturing nec; recycling	(36-37)	-	-	3.0	2.2	-	-	1.3	0.9 [1]	4.9	1.4	1.0	2.8	0.5	2.5	1.3	1.8	0.3	0.9	0.1	0.2
Electricity, gas and water supply	(40-41)	0.4	0.2	0.1	0.7	1.1	0.7	0.0	0.0	0.1	0.2	2.6	2.0	1.2	1.6	0.3	0.2	-	-	0.7	0.1
Construction	(45)	0.0	0.1	0.3	0.4	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.6	0.2	0.2	0.1	0.1	-	-	0.0	0.0
Total services[5]	**(50-99)**	**0.3**	**0.4**	**0.2**	**0.3**	**0.3**	**0.4**	**1.1**	**0.5**	**0.4**	**0.9**	**0.2**	**0.5**	**0.1**	**0.2**	**0.1**	**0.2**	**0.2**	**0.4**	**0.1**	**0.2**
Wholesale and retail trade; restaurants and hotels	(50-55)	-	-	0.1	0.1	-	-	-	0.1	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.0
Transport and storage and communication	(60-64)	-	-	0.0	0.6	0.4	0.1	0.1	0.1	-	-	0.3	1.6	-	-	-	-	0.5	1.6	0.0	0.0
Transport and storage	(60-63)	-	-	-	-	0.1	0.1	0.1	-	-	-	0.0	0.2	0.1	1.8	-	0.6	0.0	-	0.0	0.0
Post and telecommunications	(64)	-	-	-	-	0.8	0.2	0.0	-	1.5	4.8	1.0	4.7	-	-	-	-	1.1	-	0.2	0.0
Finance, insurance, real estate and business services	(65-74)	-	-	0.6	0.6	0.6	0.9	3.1	1.3	-	1.7	-	-	-	-	-	-	-	0.8	0.3	0.4
Financial intermediation	(65-67)	-	-	0.5	0.2	0.4	0.2	0.0	0.0	-	0.7	-	-	-	-	-	-	-	0.0	0.0	0.2
Real estate, renting and business activities	(70-74)	-	-	0.6	0.7	0.7	1.2	5.0	1.7	1.2	2.0	-	-	0.3	0.3	-	0.5	-	1.0	0.4	0.5
….Real estate activities	(70)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
….Renting of m&eq and other business activities	(71-74)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
……Other business activities	(74)	-	-	-	-	-	-	3.0	-	3.4	1.7	-	0.3	-	0.5	-	-	-	-	-	0.2
Community social and personal services	(75-99)	-	-	0.0	0.0	-	-	0.0	0.2	-	-	-	0.1	-	-	-	-	-	0.0	0.0	0.0
High-technology manufactures		16.5	15.5 [1]	-	-	24.9	29.3	36.3	5.2 [1]	21.7	23.5	27.2	29.2	35.8	25.9	21.0	22.6	6.2	5.9	15.0	12.7
Medium-high technology manufactures		4.5	5.2 [1]	-	-	1.6	2.0	4.7	4.8 [1]	4.8	7.1	7.8	8.4	8.6	8.6	8.8	10.7	1.8	1.1	4.8	3.6
Medium-low technology manufactures		2.3	1.9 [1]	-	-	2.0	1.0	2.3	0.9 [1]	1.6	2.4	3.6	3.7	2.4	2.4	1.6	2.0	1.2	1.6	0.9	0.5
Low-technology manufactures		-	-	1.3	1.9	0.6	0.5	1.1	0.3 [1]	1.5	1.0	2.4	1.6	0.6	1.0	0.7	0.8	0.8	0.6	0.1	0.2
High- and medium-high technology manufactures		7.3	7.9 [1]	10.0	14.6	8.0	9.6	5.2	4.8 [1]	9.3	13.3	11.7	18.3	16.7	14.3	11.2	13.0	3.8	3.3	7.5	6.0

1. Intensity of the previous year.

2. 1998 instead of 1995.

3. EU includes the 15 EU Members before 1 May 2004 excluding Austria, Greece, Luxembourg, Portugal (for which no Anberd data are available).

4. OECD includes previous EU countries and Canada, Japan, and the United States.

5. Due to differences in data reporting methodologies, service sector R&D figures are not fully comparable across countries.

Source: OECD, STAN Indicators 2004.

StatLink: http://dx.doi.org/10.1787/052066133807

Table 13. Intensity in business R&D expenditures by sector, 1991 and 2001 or nearest years available (cont'd)

As a percentage of value added in industry

		Korea		Netherlands		Norway		Poland		Spain		Sweden		UK		US		EU[3]		OECD[4]	
		1995	2001	1991	2000	1991	1998	1994	2001	1991	2001	1991	2001	1991	2001	1991	2000	1992	1999	1991	1999
Total manufacturing	**(15-37)**	**5.2**	**6.0**	**5.1**	**5.7**	**5.1**	**4.1**	**1.2**	**1.0**	**1.9**	**1.8**	**9.8**	**15.7**	**5.7**	**6.6**	**8.5**	**8.5**	**5.3**	**5.7**	**83.9**	**76.8**
Food prod., beverages and tobacco	(17-19)	0.9	0.9	1.8	2.4	1.2	1.5	0.1	0.1 [1]	0.3	0.7	1.6	1.1	1.2	1.5	1.1	1.1	0.9	0.9	1.5	1.3
Textiles, textile prod., leather and footwear	(20-22)	0.6	1.1	0.7	1.0	0.9	1.8	0.5	0.4 [1]	0.1	0.6	0.9	1.2	0.3	0.5	0.5	0.5	0.4	0.6	0.5	0.4
Wood, pulp, paper, paper prod., printing & publishing	(23-25)	0.6	0.5	0.2	0.3	0.8	0.9	0.1	0.1 [1]	0.2	0.2	1.7	1.7	0.3	0.1	1.0	1.6	0.4	0.4	1.1	1.3
Chemical, rubber, plastics and fuel prod.	(23)	3.4	2.8	10.7	8.1	11.6	7.5	1.7	1.3 [1]	2.8	3.0	14.9	23.3	11.4	14.9	10.3	9.1	8.6	9.2	18.1	15.9
Coke, refined petroleum prod. and nuclear fuel	23	1.3	0.7	6.1	2.0	-	-	1.2	0.6 [1]	1.0	1.0	0.9	3.1	12.7	9.6	8.7	3.1	4.5	4.0	1.7	0.5
Chemicals and chemical prod.	(24)	5.2	5.3	13.9	10.6	-	-	2.3	2.3 [1]	4.3	4.7	20.8	30.7	15.8	23.1	12.9	12.6	12.5	12.9	14.9	14.0
….Chemicals excluding pharmaceuticals	(24ex2423)	6.1	5.5	12.1	7.2	-	-	-	1.8 [1]	2.7	2.0	6.9	6.5	8.4	5.6	9.2	8.0	8.9	7.3	8.1	5.9
….Pharmaceuticals	(2423)	2.9	4.8	27.5	25.4	42.7	19.6	-	3.9 [1]	7.2	10.4	39.5	45.5	32.9	50.0	22.2	20.2	21.9	25.3	6.8	8.1
Rubber and plastics prod.	(25)	2.4	2.6	1.7	1.6	1.3	3.5	1.1	0.5 [1]	1.1	1.2	2.8	2.3	0.7	0.6	3.4	2.9	1.9	2.6	1.5	1.5
Other non-metallic mineral prod.	(26)	1.4	1.1	0.4	1.0	1.9	1.6	0.2	0.2 [1]	0.4	0.4	1.3	1.2	1.2	0.8	2.0	2.2	1.1	1.3	1.0	0.7
Basic metals and fabricated metal prod.	(27-28)	1.8	1.2	1.4	1.5	4.7	3.0	0.7	0.5 [1]	0.7	0.7	1.9	2.6	0.9	0.7	1.6	1.6	1.3	1.2	2.9	2.0
Machinery and equipment	(29-33)	10.7	18.1	11.6	17.9	15.0	11.2	2.8	2.5 [1]	5.3	3.6	21.0	38.1	9.1	10.2	13.6	16.5	9.1	9.1	35.9	35.0
Machinery and equipment, n.e.c.	(29)	5.1	5.3	2.1	9.1	6.9	6.1	2.6	2.5 [1]	1.8	2.4	9.6	10.0	5.3	8.1	3.9	5.5	4.6	4.9	5.6	5.6
Electrical and optical equipment	(30-33)	12.7	22.8	18.2	25.4	23.6	16.4	3.1	2.4 [1]	8.1	4.8	35.4	89.1	11.7	11.5	18.4	21.4	13.1	12.8	30.3	29.4
….Office, accounting and computing machinery	(30)	10.1	21.5	31.3	257.7	34.5	20.8	0.3	1.4 [1]	11.4	4.6	19.1	18.3	13.4	4.2	40.0	30.7	-	15.4	7.9	5.2
….Electrical machinery and apparatus, nec	(31)	5.1	10.5	40.4	7.8	6.8	4.5	2.7	2.1 [1]	3.0	2.4	12.5	7.6	11.8	10.4	8.4	9.6	-	4.3	5.1	3.9
….Radio, television and communication equip.	(32)	15.0	29.0	14.0	0.5	71.2	54.1	5.5	5.3 [1]	16.0	12.6	82.1	-862.9	14.7	18.5	15.9	18.6	-	25.7	11.1	12.6
….Medical, precision and optical instruments	(33)	4.0	4.9	-	-	10.1	6.5	1.4	1.0 [1]	6.7	3.4	3.9	25.8	7.7	8.8	16.9	30.2	-	11.4	6.2	7.8
Transport equipment	(34-35)	11.3	6.7	7.4	3.9	2.0	2.5	3.6	3.2 [1]	4.8	4.7	17.5	24.3	14.3	14.7	25.4	16.2	15.2	15.5	22.4	19.7
Motor vehicles, trailers and semi-trailers	(34)	12.3	7.5	14.7	5.9	4.5	9.2	2.5	2.7 [1]	3.5	2.8	17.9	25.2	10.4	10.3	22.8	15.4	-	13.6	11.3	12.1
Other transport equipment	(35)	7.0	5.4	3.6	1.4	1.8	1.7	4.5	3.8 [1]	9.8	13.3	16.4	20.6	18.4	19.3	27.3	17.5	-	21.0	11.0	7.5
….Building and repairing of ships and boats	(351)	4.0	-	-	1.9	1.7	1.5	-	1.6 [1]	3.1	7.4	5.5	3.1	2.0	6.2	-	-	-	3.5	0.1	0.1
….Aircraft and spacecraft	(353)	49.9	-	-	0.6	1.8	13.5	-	9.0 [1]	35.9	27.9	25.6	29.7	22.8	21.2	31.7	20.8	-	31.6	10.5	6.8
….Railroad equip. and transport equip. n.e.c.	(352+359)	3.0	-	-	1.7	3.4	0.8	-	4.6 [1]	1.8	6.5	5.5	11.0	3.9	28.2	-	-	-	8.9	0.4	0.6
Manufacturing nec; recycling	(36-37)	0.6	3.6	-	0.4	-	-	0.2	0.3 [1]	0.3	0.6	1.5	1.2	0.7	0.5	-	1.3	-	0.9	-	0.6
Electricity, gas and water supply	(40-41)	1.8	0.9	0.1	0.4	0.0	-	0.1	0.2	0.4	0.2	1.5	0.5	1.3	0.6	0.2	0.1	-	-	-	-
Construction	(45)	1.1	0.8	0.1	0.2	0.1	-	0.2	0.1	0.0	0.1	-	0.2	0.1	0.1	-	0.1	-	-	-	-
Total services[5]	**(50-99)**	**0.3**	**0.5**	**0.1**	**0.3**	**0.6**	**0.7**	**0.1**	**0.1**	**0.1**	**0.3**	**0.3**	**0.6**	**0.3**	**0.4**	**0.7**	**0.9**	**0.2**	**0.2**	**14.4**	**20.8**
Wholesale and retail trade; restaurants and hotels	(50-55)	0.0 [2]	0.1	-	-	-	0.0 [1]	0.0	0.0	0.0	0.0	-	0.0	-	-	-	-	-	-	-	-
Transport and storage and communication	(60-64)	1.5 [2]	1.0	-	0.4	0.2	0.7 [1]	0.2	0.3	0.2	0.5	-	0.6	-	1.0	-	-	-	-	-	-
Transport and storage	(60-63)	0.0 [2]	0.0	-	0.1	0.0	0.1 [1]	-	-	0.0	-	-	0.0	-	0.0	-	0.1	-	-	-	-
Post and telecommunications	(64)	4.5 [2]	2.9	-	0.9	1.0	2.7 [1]	-	-	0.6	-	-	1.9	1.9	2.5	-	-	-	-	-	-
Finance, insurance, real estate and business services	(65-74)	0.5 [2]	1.0	-	0.6	2.0	2.0 [1]	0.2	0.1	0.4	0.7	-	1.5	-	-	-	-	-	-	-	-
Financial intermediation	(65-67)	0.0 [2]	0.0	-	0.4	0.2	0.2 [1]	0.0	0.0	0.0	0.1	-	1.1	-	-	-	0.5	-	-	-	-
Real estate, renting and business activities	(70-74)	0.7 [2]	1.6	-	0.7	2.8	2.6 [1]	0.2	0.1	0.5	1.0	-	1.5	1.0	0.7	-	-	-	-	-	-
….Real estate activities	(70)	- [2]	-	-	-	-	- [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
….Renting of m&eq and other business activities	(71-74)	- [2]	-	-	-	-	- [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
……Other business activities	(74)	- [2]	-	-	0.4	2.1	1.0 [1]	-	-	-	-	-	0.1	-	0.4	-	-	-	-	-	-
Community social and personal services	(75-99)	0.1 [2]	0.0	0.2	0.0	-	0.0 [1]	0.1	0.1	0.0	0.0	-	0.0	0.0	0.0	-	-	-	-	-	-
High-technology manufactures		12.5	-	13.2	26.1	34.4	24.6	-	3.5 [1]	11.6	10.3	39.9	81.1	18.9	23.1	23.6	22.5	-	22.0	42.4	40.4
Medium-high technology manufactures		8.3	-	11.7	7.7	-	-	-	2.3 [1]	2.8	2.5	11.6	14.5	8.2	8.7	9.7	9.8	-	7.7	30.6	28.1
Medium-low technology manufactures		1.8	-	1.8	1.5	-	-	-	0.5 [1]	0.8	0.9	2.0	2.5	2.3	1.6	2.9	2.1	-	1.7	7.3	4.8
Low-technology manufactures		0.7	1.0	-	1.2	-	-	0.2	0.2 [1]	0.3	0.5	1.6	1.5	0.7	0.7	-	1.3	-	0.7	-	3.6
High- and medium-high technology manufactures		9.7	11.3	11.9	13.1	-	-	2.9	2.6 [1]	4.9	4.2	20.0	32.0	12.1	14.5	16.0	15.6	11.3	11.6	73.2	68.6

1. Intensity of the previous year.

2. 1998 instead of 1995.

3. EU includes the 15 EU Members before 1 May 2004 excluding Austria, Greece, Luxembourg, Portugal (for which no Anberd data are available).

4. OECD includes previous EU countries and Canada, Japan, and the United States.

5. Due to differences in data reporting methodologies, service sector R&D figures are not fully comparable across countries.

Source: OECD, STAN Indicators 2004.

Table 14. Business R&D expenditures by sector, 1991 and 2001 or nearest years available

As a percentage of total R&D expenditures

	(ISIC Rev.3)	Australia		Belgium		Canada		Czech Republic		Denmark		Finland		France		Germany		Ireland		Italy	
		1991	2000	1992	2001	1991	2001	1992	2001	1991	1999	1991	2001	1991	2000	1991	2001	1991	1999	1991	2001
Total business sector	**(01-99)**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Total manufacturing	**(15-37)**	**62.8**	**50.4**	**84.9**	**82.9**	**66.7**	**69.8**	**59.3**	**68.3**	**69.4**	**60.4**	**85.3**	**84.6**	**92.1**	**85.0**	**95.4**	**90.9**	**84.7**	**74.9**	**89.8**	**79.4**
Food prod., beverages and tobacco	(15-16)	4.0	3.5	3.0	2.4	1.3	0.7	1.0	0.4	4.6	2.5	6.6	1.4	1.8	2.0	0.8	0.8	12.3	5.6	0.9	1.2
Textiles, textile prod., leather and footwear	(17-19)	0.4	0.7	1.3	2.1	1.0	0.7	6.6	0.7	0.4	0.2	1.0	0.4	0.5	0.6	0.6	0.6	2.3	0.5	0.2	0.6
Wood, pulp, paper, paper prod., printing & publishing	(20-22)	1.9	1.4	1.1	1.1	2.3	1.4	0.6	0.1	0.6	0.5	9.4	3.1	0.4	0.3	0.5	0.3	1.0	1.2	0.1	0.4
Chemical, rubber, plastics and fuel prod.	(23-25)	12.7	9.5	37.5	39.7	11.7	8.4	7.7	7.1	21.5	28.7	17.7	11.5	20.6	22.6	19.8	19.8	20.7	15.1	20.0	15.7
Coke, refined petroleum prod. and nuclear fuel	(23)	0.5	0.3	2.8	1.0	3.0	0.4	1.4	0.1	0.0	0.0	2.2	0.8	2.0	1.3	0.2	0.2	0.0	0.0	1.3	0.7
Chemicals and chemical prod.	(24)	10.1	8.4	32.0	36.8	8.2	7.3	4.1	5.9	20.8	26.5	13.7	8.9	16.5	18.6	18.1	17.7	19.1	13.6	16.9	13.2
….Chemicals excluding pharmaceuticals	(24ex2423)	5.1	1.6	21.7	16.0	3.4	1.8	3.2	3.2	3.0	3.5	8.7	2.9	8.9	6.1	13.4	10.9	6.3	3.1	6.1	5.1
….Pharmaceuticals	(2423)	5.0	6.8	10.3	20.9	4.8	5.6	0.9	2.7	17.8	23.0	4.9	6.0	7.7	12.4	4.7	6.8	12.8	10.5	10.8	8.1
Rubber and plastics prod.	(25)	2.0	0.9	2.8	1.9	0.5	0.6	2.2	1.1	0.7	2.2	1.9	1.7	2.1	2.7	1.5	2.0	1.5	1.5	1.8	1.8
Other non-metallic mineral prod.	(26)	1.3	0.6	1.5	1.7	0.3	0.1	1.0	2.6	1.5	0.6	1.3	0.5	1.1	1.3	1.0	0.9	1.7	0.9	0.5	0.6
Basic metals and fabricated metal prod.	(27-28)	10.0	4.3	5.4	4.8	4.3	2.8	8.0	4.0	2.6	1.1	6.2	3.5	2.9	2.3	2.4	2.3	2.3	1.1	3.3	1.4
Machinery and equipment	(29-33)	20.4	19.9	29.3	25.7	32.3	44.7	19.8	14.2	31.7	23.9	38.5	62.2	33.6	30.3	38.8	31.7	40.9	48.2	34.6	33.7
Machinery and equipment, n.e.c.	(29)	4.2	4.0	5.5	4.5	1.8	2.3	10.0	7.4	12.6	10.0	10.5	7.6	4.3	4.8	11.4	11.2	3.5	2.9	5.8	7.0
Electrical and optical equipment	(30-33)	16.2	15.9	23.8	21.2	30.5	42.4	9.8	6.8	19.2	13.9	28.1	54.5	29.3	25.5	27.3	20.5	37.4	45.3	28.8	26.7
….Office, accounting and computing machinery	(30)	2.1	1.9	0.3	0.3	6.1	4.1	0.2	0.0	1.5	0.8	0.9	0.2	3.5	1.5	3.9	1.9	8.3	5.1	6.8	1.1
….Electrical machinery and apparatus, nec	(31)	2.6	1.4	4.9	2.2	1.0	2.3	3.0	2.4	2.6	2.9	4.9	4.4	3.0	3.5	7.3	3.0	4.4	4.7	5.9	3.4
….Radio, television and communication equip.	(32)	9.4	9.9	16.1	17.5	22.2	33.7	5.0	2.9	7.3	4.0	16.8	47.5	8.1	13.7	10.1	10.7	21.5	30.6	14.7	18.3
….Medical, precision and optical instruments	(33)	2.2	2.7	2.5	1.2	1.2	2.3	1.5	1.4	7.9	6.1	5.4	2.4	14.7	6.8	6.0	4.9	3.3	5.0	1.3	4.0
Transport equipment	(34-35)	10.5	9.1	4.2	4.7	13.0	10.6	13.4	38.9	1.3	1.9	3.9	1.4	31.0	24.5	30.8	33.9	3.0	1.6	30.2	25.4
Motor vehicles, trailers and semi-trailers	(34)	6.7	7.9	2.3	2.6	1.4	2.6	7.1	34.8	0.0	0.5	1.5	0.4	11.5	13.8	21.4	29.8	2.7	1.2	18.3	14.0
Other transport equipment	(35)	3.8	1.2	1.9	2.1	11.5	8.0	6.3	4.2	1.3	1.5	2.4	1.0	19.5	10.7	9.4	4.1	0.2	0.4	12.0	11.4
….Building and repairing of ships and boats	(351)	1.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.5	0.8	0.3	0.1	0.1	0.3	0.1	0.0	0.1	0.4	0.2
….Aircraft and spacecraft	(353)	1.2	0.1	1.4	1.8	11.5	7.8	4.1	2.8	0.0	0.0	0.1	0.3	18.9	10.2	8.2	3.6	0.0	0.4	10.6	10.2
….Railroad equip. and transport equip. n.e.c.	(352+359)	0.6	0.5	0.5	0.3	0.0	0.2	2.2	1.4	0.4	0.0	1.6	0.4	0.5	0.4	1.0	0.5	0.2	0.0	1.0	1.0
Manufacturing nec; recycling	(36-37)	-	-	1.6	0.8	0.6	0.4	1.3	0.3	5.3	0.9	0.5	0.6	0.3	1.1	0.6	0.6	0.4	0.6	0.2	0.3
Electricity, gas and water supply	(40-41)	2.2	0.7	0.2	1.0	4.4	1.5	0.1	0.0	0.3	0.3	4.5	1.4	1.9	2.1	0.4	0.2	-	-	2.0	0.5
Construction	(45)	0.3	0.9	1.4	1.0	0.2	0.4	0.5	1.2	0.8	0.2	1.1	1.2	0.8	0.6	0.3	0.2	-	-	0.0	0.2
Total services[3]	**(50-99)**	**27.1**	**39.9**	**13.3**	**13.7**	**25.5**	**26.4**	**38.8**	**29.8**	**28.5**	**38.9**	**7.6**	**12.4**	**4.2**	**10.6**	**3.5**	**8.4**	**13.5**	**24.6**	**8.1**	**19.9**
Wholesale and retail trade; restaurants and hotels	(50-55)	-	-	1.3	1.0	-	-	-	1.2	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.6
Wholesale and retail trade; repairs	(50-52)	-	-	1.3	1.0	4.0	4.4	-	1.2	5.5	7.5	-	0.1	-	0.0	-	-	-	0.0	0.0	0.6
Hotels and restaurants	(55)	-	-	0.0	0.0	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.0
Transport and storage and communication	(60-64)	-	-	0.2	2.5	3.3	0.8	0.3	0.9	-	-	1.9	6.4	-	-	-	-	4.2	9.2	0.4	0.2
Transport and storage	(60-63)	-	-	0.1	1.0	0.4	0.3	0.3	0.8	-	-	0.1	0.5	0.3	5.2	-	1.1	0.2	0.0	0.0	0.1
Post and telecommunications	(64)	-	-	0.1	1.5	2.9	0.5	0.0	0.1	2.9	6.8	1.8	5.9	-	-	-	-	4.0	9.2	0.4	0.1
Finance, insurance, real estate and business services	(65-74)	-	-	11.6	9.8	18.3	21.3	38.5	23.8	-	24.6	-	-	-	-	-	-	-	15.3	7.5	19.1
Financial intermediation	(65-67)	-	-	2.4	0.7	2.9	1.6	0.0	0.0	-	2.2	-	-	-	-	-	-	-	0.0	0.0	2.5
Real estate, renting and business activities	(70-74)	-	-	9.2	9.1	15.3	19.7	38.5	23.8	20.0	22.5	-	-	4.0	5.5	-	6.9	-	15.3	7.5	16.6
……..Other business activities	(74)	-	-	4.5	5.0	2.4	3.1	9.2	1.8	15.9	5.6	-	0.5	-	2.9	-	-	-	1.5	0.5	2.2
Community social and personal services	(75-99)	-	-	0.1	0.4	-	-	0.0	3.9	-	-	-	1.0	-	-	-	-	-	0.0	0.2	0.0
High-technology manufactures		19.9	21.4	30.6	41.7	45.8	53.5	11.7	9.8	34.3	34.0	28.2	56.4	52.8	44.6	32.9	27.9	45.9	51.5	44.2	41.6
Medium-high technology manufactures		19.2	15.4	34.9	25.5	7.6	9.1	25.6	49.2	18.6	16.9	27.1	15.8	28.1	28.6	54.5	55.3	17.2	11.8	37.1	30.5
Medium-low technology manufactures		15.8	6.8	12.5	9.3	8.1	3.9	12.6	7.8	5.6	5.4	12.4	6.9	8.2	7.8	5.5	5.4	5.6	3.6	7.2	4.8
Low-technology manufactures		-	-	7.0	6.4	5.2	3.3	9.4	1.5	10.9	4.1	17.5	5.5	2.9	4.0	2.5	2.3	16.1	8.0	1.3	2.5
High- and medium-high technology manufactures		41.0	37.4	65.4	67.2	53.5	62.6	37.3	59.1	53.8	52.4	56.1	72.5	81.1	73.3	87.7	83.2	63.0	63.4	81.8	72.3

1. EU includes the 15 EU Members before 1May 2004 excluding Austria, Greece, Luxembourg, Portugal (for which no Anberd data are available).

2. OECD includes previous countries and Canada, Japan, and the United States.

3. Due to differences in data reporting methodologies, service sector R&D figures are not fully comparable across countries.

Source: OECD, STAN Indicators 2004.

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Table 14. Business R&D expenditures by sector, 1991 and 2001 or nearest years available (cont'd)

As a percentage of total R&D expenditures

	(ISIC Rev.3)	Korea		Netherlands		Norway		Poland		Spain		Sweden		United Kingdom		Unites States		EU[1]		OECD[2]	
		1995	2001	1991	2000	1991	1998	1994	2001	1991	2001	1991	2001	1991	2001	1991	2000	1992	1999	1991	1999
Total business sector	**(01-99)**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Total manufacturing	**(15-37)**	**83.3**	**82.8**	**89.7**	**75.9**	**63.3**	**54.4**	**71.9**	**69.4**	**78.4**	**60.0**	**87.9**	**87.4**	**79.7**	**79.2**	**75.7**	**64.9**	**87.9**	**84.3**	**83.9**	**76.8**
Food prod., beverages and tobacco	(15-16)	1.4	1.4	5.6	5.8	2.5	2.9	1.5	4.7	2.4	3.1	1.4	0.5	2.4	2.5	1.1	0.8	1.8	1.7	1.5	1.3
Textiles, textile prod., leather and footwear	(17-19)	0.7	0.7	0.4	0.3	0.3	0.4	3.7	1.8	0.5	1.5	0.1	0.1	0.3	0.2	0.2	0.1	0.5	0.5	0.5	0.4
Wood, pulp, paper, paper prod., printing & publishing	(20-22)	0.5	0.3	0.5	0.5	2.1	2.3	0.7	0.9	0.8	0.7	3.3	2.0	0.5	0.3	1.2	1.6	0.7	0.7	1.1	1.3
Chemical, rubber, plastics and fuel prod.	(23-25)	10.6	9.3	37.6	21.4	17.4	11.3	16.2	14.9	18.4	17.1	17.0	20.1	28.4	30.4	15.7	12.1	22.3	22.6	18.1	15.9
Coke, refined petroleum prod. and nuclear fuel	(23)	1.3	1.1	2.7	0.7	1.6	1.6	2.3	0.6	1.3	1.0	0.1	0.2	4.5	2.0	2.1	0.6	1.3	0.8	1.7	0.5
Chemicals and chemical prod.	(24)	8.1	7.0	33.9	20.1	15.4	8.7	11.0	12.8	15.2	14.1	16.2	19.5	23.4	28.1	12.5	10.7	19.7	20.0	14.9	14.0
....Chemicals excluding pharmaceuticals	(24ex2423)	6.7	4.8	26.2	11.2	8.4	4.3	8.8	7.0	6.3	4.3	3.1	1.6	8.7	4.1	6.5	4.2	10.1	7.8	8.1	5.9
....Pharmaceuticals	(2423)	1.4	2.2	7.7	8.9	7.0	4.4	2.3	5.8	8.8	9.8	13.1	17.9	14.7	24.0	6.0	6.5	9.5	12.2	6.8	8.1
Rubber and plastics prod.	(25)	1.3	1.3	1.1	0.7	0.4	1.0	2.9	1.5	1.9	2.0	0.7	0.4	0.4	0.4	1.1	0.8	1.4	1.8	1.5	1.5
Other non-metallic mineral prod.	(26)	1.0	0.5	0.3	0.6	0.9	0.8	0.9	0.9	1.3	1.1	0.4	0.2	0.5	0.3	0.4	0.4	0.9	0.9	1.0	0.7
Basic metals and fabricated metal prod.	(27-28)	3.6	1.8	3.2	2.3	7.3	5.6	5.4	4.3	3.2	2.8	2.3	2.0	1.4	0.9	1.4	1.3	2.6	2.2	2.9	2.0
Machinery and equipment	(29-33)	41.1	51.3	36.3	42.0	29.7	26.3	26.4	28.9	31.5	16.9	43.9	43.4	25.8	25.2	31.5	33.0	34.0	30.5	35.9	35.0
Machinery and equipment, n.e.c.	(29)	5.1	4.1	2.8	9.9	7.0	7.3	13.9	14.2	4.8	5.7	11.2	7.4	6.0	7.7	3.0	3.4	7.9	7.5	5.6	5.6
Electrical and optical equipment	(30-33)	36.0	47.2	33.5	32.1	22.7	19.0	12.5	14.7	26.7	11.2	32.7	36.0	19.7	17.5	28.5	29.6	26.0	23.0	30.3	29.4
....Office, accounting and computing machinery	(30)	1.8	7.8	4.1	25.7	1.8	1.0	0.0	0.2	5.9	1.1	2.2	0.8	4.0	0.8	9.6	5.2	3.7	2.5	7.9	5.2
....Electrical machinery and apparatus, nec	(31)	1.9	1.8	15.6	1.6	3.4	2.4	5.4	6.6	4.3	2.8	3.1	1.6	6.4	4.6	2.6	1.9	5.7	3.1	5.1	3.9
....Radio, television and communication equip.	(32)	31.6	36.2	12.8	0.3	15.6	13.5	5.8	6.0	13.1	5.7	26.6	28.9	5.9	8.2	8.8	12.9	10.8	12.6	11.1	12.6
....Medical, precision and optical instruments	(33)	0.7	1.4	1.0	4.5	2.0	2.1	1.3	1.9	3.5	1.5	1.0	4.8	3.4	3.8	7.4	9.6	5.8	4.7	6.2	7.8
Transport equipment	(34-35)	24.1	16.8	5.8	2.7	3.1	4.6	16.6	12.0	19.7	16.0	19.1	19.0	20.2	19.1	23.5	15.1	24.6	24.8	22.4	19.7
Motor vehicles, trailers and semi-trailers	(34)	21.1	11.5	4.0	2.2	0.5	1.8	5.2	5.6	11.4	7.8	13.9	15.9	7.4	6.9	8.9	9.3	13.9	16.1	11.3	12.1
Other transport equipment	(35)	3.0	5.3	1.8	0.4	2.6	2.8	11.4	6.5	8.3	8.3	5.3	3.1	12.8	12.2	14.6	5.8	10.7	8.7	11.0	7.5
....Building and repairing of ships and boats	(351)	1.4	1.0	0.1	0.3	2.1	2.4	1.1	1.6	1.2	1.9	0.3	0.1	0.2	0.7	0.0	0.0	0.3	0.3	0.1	0.1
....Aircraft and spacecraft	(353)	1.5	3.8	1.7	0.1	0.3	0.4	4.4	3.8	6.6	5.2	4.4	2.7	12.4	9.9	14.2	5.2	9.8	7.7	10.5	6.8
....Railroad equip. and transport equip. n.e.c.	(352+359)	0.1	0.4	0.0	0.1	0.3	0.0	5.9	1.1	0.5	1.2	0.5	0.3	0.2	1.6	0.4	0.6	0.6	0.7	0.4	0.6
Manufacturing nec; recycling	(36-37)	0.2	0.6	-	0.4	-	-	0.5	1.0	0.6	0.8	0.4	0.2	0.3	0.3	-	0.4	-	0.6	-	0.6
Electricity, gas and water supply	(40-41)	2.0	1.1	0.3	0.5	0.1	-	0.6	2.3	2.5	0.6	2.3	0.4	2.4	0.8	0.2	0.1	-	-	-	-
Construction	(45)	6.7	3.1	0.5	0.8	0.5	-	4.2	3.6	0.6	0.9	-	0.3	0.2	0.2	-	0.1	-	-	-	-
Total services[3]	**(50-99)**	**7.6**	**12.6**	**6.7**	**19.7**	**41.8**	**48.0**	**14.4**	**18.2**	**16.4**	**37.6**	**9.0**	**11.5**	**15.1**	**18.8**	**24.3**	**34.4**	**8.2**	**12.9**	**14.4**	**20.8**
Wholesale and retail trade; restaurants and hotels	(50-55)	-	0.4	-	-	-	-	0.3	0.3	0.0	0.8	-	0.1	-	-	-	-	-	-	-	-
Wholesale and retail trade; repairs	(50-52)	-	0.4	-	4.0	0.4	-	0.3	0.3	0.0	0.7	-	0.1	-	0.4	-	12.6	-	-	-	-
Hotels and restaurants	(55)	-	0.0	-	-	-	-	0.0	0.0	0.0	0.1	-	0.0	-	-	-	-	-	-	-	-
Transport and storage and communication	(60-64)	-	3.0	-	2.4	2.8	-	4.1	7.7	2.5	8.8	-	1.4	-	5.9	-	-	-	-	-	-
Transport and storage	(60-63)	-	0.0	-	0.6	0.4	-	1.3	2.6	0.0	0.2	-	0.0	-	0.1	-	0.1	-	-	-	-
Post and telecommunications	(64)	-	3.0	-	1.9	2.3	-	2.7	5.1	2.4	8.6	-	1.3	3.9	5.8	-	-	-	-	-	-
Finance, insurance, real estate and business services	(65-74)	-	8.9	-	13.2	38.6	-	5.5	3.5	13.4	27.4	-	10.0	-	-	-	-	-	-	-	-
Financial intermediation	(65-67)	-	0.0	-	2.2	1.1	-	0.0	0.1	0.0	0.6	-	1.1	-	-	-	2.0	-	-	-	-
Real estate, renting and business activities	(70-74)	-	8.9	-	11.0	37.5	-	5.5	3.4	13.4	26.8	-	8.9	10.9	12.3	-	-	-	-	-	-
……..Other business activities	(74)	1.3	2.1	-	3.1	7.1	-	0.0	0.1	6.8	3.9	-	0.3	1.8	2.7	-	-	-	2.2	-	-
Community social and personal services	(75-99)	-	0.3	4.7	0.1	-	-	4.5	6.8	0.4	0.6	-	0.1	0.2	0.1	-	-	-	-	-	-
High-technology manufactures		37.0	51.4	27.3	39.5	26.6	21.4	13.8	17.7	37.9	23.4	47.2	55.1	40.5	46.8	46.1	39.4	39.7	39.7	42.4	40.4
Medium-high technology manufactures		34.9	22.6	48.6	24.9	19.5	15.8	39.1	34.5	27.3	21.7	31.7	26.7	28.7	24.9	21.4	19.4	38.2	35.2	30.6	28.1
Medium-low technology manufactures		8.6	5.7	7.4	4.5	12.2	11.4	12.6	8.8	8.9	8.8	3.8	2.8	7.1	4.2	5.0	3.2	6.5	6.0	7.3	4.8
Low-technology manufactures		2.9	3.1	-	7.0	-	-	6.5	8.4	4.3	6.1	5.2	2.8	3.5	3.2	-	3.0	-	3.4	-	3.6
High- and medium-high technology manufactures		73.3	75.1	76.0	64.7	48.2	39.6	54.0	53.7	66.4	47.0	79.3	81.9	69.4	72.4	67.5	58.8	78.2	75.3	73.2	68.6

1. EU includes the 15 EU Members before 1 May 2004 excluding Austria, Greece, Luxembourg, Portugal (for which no Anberd data are available).

2. OECD includes previous countries and Canada, Japan, and the United States.

3. Due to differences in data reporting methodologies, service sector R&D figures are not fully comparable across countries.

Source: OECD, STAN Indicators 2004.

Table 15. R&D expenditures of affiliates under foreign control, 1991-2002

	As a percentage of total business R&D expenditures							As a percentage of GDP						
	1991	1995	1997	1999	2000	2001	2002	1991	1995	1997	1999	2000	2001	2002
Australia	-	31.1	-	41.8	-	-	-	-	0.27	-	0.28	-	-	-
Canada	-	29.7	34.3	32.6	32.1	31.6 n	-	-	0.30	0.35	0.35	0.37	0.38 p	- p
Czech Republic	-	-	22.1	27.4	36.9	45.3	43.4	- d,t	- a	0.16 d,t	0.21	0.30	0.35	0.34
Finland	-	-	13.3	14.9	12.7	14.3	-	-	-	0.24	0.33	0.31	0.34	-
France[1, 2]	-	17.1	16.4	16.4 -	-	21.5	-	-	0.24	0.22	0.22 -	-	0.30 a	- p
Germany	-	16.1	18.1	19.0	-	-	-	- a	0.24	0.28	0.32	- c	-	- c
Greece	7.6	3.8	3.6	4.5	-	-	-	0.01	0.01 a	0.00	0.01	-	- c	-
Hungary[2]	-	21.8	65.3	78.5 -	-	-	-	- t	0.07 a	0.20	0.20 -	-	-	-
Ireland	68.6	66.2	65.3	63.8	-	65.2	-	0.40	0.59	0.59	0.55	- c	0.52	-
Italy[3]	23.1	-	-	-	-	-	-	0.15	-	-	-	-	-	- p
Japan	0.9	1.4	1.3	3.9	3.6	-	-	0.02 l	0.03 l	0.03	0.08	0.08	-	-
Netherlands	-	-	20.6	21.5	18.7	-	-	-	- a	0.23	0.25	0.21	-	- p
Poland[4]	-	-	-	12.1	12.1	4.6	-	-	- a	-	0.03	0.03	0.01	- b
Portugal	-	-	-	18.0	-	30.8	-	-	- a	-	0.03	- c	0.08	- c
Slovak Republic[4]	-	0.8	-	20.4	20.4	19.0	-	- d,t	0.00 d	- a	0.09	0.09	0.08	-
Spain[5]	38.7 -	26.8	35.7	32.8	-	31.0	-	0.18 -	0.10 a	0.14	0.15	-	0.15	- a
Sweden	17.1	18.4	15.9	34.1	34.0	-	-	0.32 m	0.46 a,m	0.42 m	0.93 m	-	- m	-
Turkey	-	-	14.8	7.3	10.6	-	-	-	-	0.02	0.02	0.02	-	-
United Kingdom	-	29.2	32.8	31.2	31.3	40.6	38.0	-	0.37	0.39	0.39	0.38	0.50 a	0.48
United States	10.2	13.3	12.3	14.7	14.7	14.9	-	0.20 j	0.24 j	0.24 j	0.29 j	0.30 j	0.30 j	- j,p

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1998 instead of 1997. 2. 1998 instead of 1999. 3. 1992 instead of 1991. 4. 2000 instead of 1999. 5. 1990 instead of 1991.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/073550815144

Table 16. Share of public R&D expenditures financed by industry, 1981-2003

As a percentage of total national R&D expenditures of the sector

	Government						
	1981	1985	1991	1995	2001	2002	2003
Australia[1, 2, 3]	1.8 [p]	2.7	5.7	5.7	5.6 [-]	-	-
Austria[4]	1.5	1.3	-	-	3.1	-	-
Belgium[5]	0.0 [a]	0.0	1.2 [b]	2.1	12.4	-	-
Canada	1.0	1.0	1.7	1.8	2.6	2.6 [n]	2.6 [n]
Czech Republic	-	-	-	11.3 [a]	6.6	9.6	-
Denmark	1.6	2.2	3.6	3.5	7.5	5.4 [a]	-
Finland	9.5 [a]	-	11.2 [a]	11.9	15.2	14.2	-
France	1.8	0.7	4.8	5.4	6.3	-	-
Germany	0.8	1.4	1.3 [a]	3.4 [m]	2.3 [m]	2.3 [b,m]	2.3 [b,m]
Greece	0.0	-	1.0	2.3	1.9	-	-
Hungary	-	-	22.0 [c]	15.1 [c]	13.1 [c]	6.4 [c]	-
Iceland	0.5	22.3	10.4	7.2	5.0	-	-
Ireland[3]	3.6	9.0	13.4 [b]	21.8	10.6	8.8 [n]	-
Italy	2.3 [r]	2.0 [r]	1.9 [a]	1.8	3.5	2.2 [n]	2.9 [n]
Japan	1.3	5.4	2.2	0.7	0.7	1.2	-
Korea	-	-	-	16.5 [e]	8.1 [e]	4.6 [e]	-
Luxembourg[3]	-	-	-	-	5.8 [-]	-	-
Mexico	-	-	-	3.3	5.8	-	-
Netherlands	5.7	23.2	14.8	16.7	21.6	18.1	-
New Zealand	-	-	5.7	17.7	20.3	-	-
Norway	3.6	7.6	7.3	10.0	10.6	-	-
Poland	-	-	-	22.6 [a]	14.3	23.3	-
Portugal[6, 7, 1]	0.2	4.1	7.1	0.3	3.5	-	-
Slovak Republic	-	-	9.3 [c,q]	32.6 [c]	14.0 [c]	14.0 [c]	-
Spain	0.7	3.8	3.8	5.3	7.1	4.1	-
Sweden	5.4 [e,f]	4.8 [e,f]	4.8 [e,f]	3.0 [f]	1.6 [f]	-	-
Switzerland[7]	-	3.4 [f]	0.3 [b,f]	-	-	-	-
Turkey[3]	-	-	0.3	3.0	5.4 [-]	-	-
United Kingdom	11.0	14.6 [a]	12.0 [a]	6.9	12.5 [a]	10.7	-
United States	0.0 [f]	0.0 [f]	0.0 [f]	0.0 [f]	0.0 [f]	0.0 [f,n]	0.0 [f,n]
Total OECD	**2.1** [b]	**2.9** [b]	**3.1** [a,b]	**3.7** [a,b]	**3.6** [b]	**-**	**-**
EU-25	**-**	**-**	**-**	**6.0** [b]	**6.7** [b]	**-**	**-**
EU-15	**4.1** [b]	**5.2** [a,b]	**4.8** [a,b]	**5.1** [b]	**6.3** [b]	**-**	**-**
China[3]	-	-	-	-	9.6 [s]	-	-
Israel[3]	-	-	1.4 [c]	0.2 [c]	7.5 [c,n]	-	-
Russian Federation	-	-	-	8.1	12.4	12.2	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991.
2. 1996 instead of 1995.
3. 2000 instead of 2001.
4. 1998 instead of 2001.
5. 1983 instead of 1981.
6. 1982 instead of 1981.
7. 1986 instead of 1985.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/702620165887

Table 16. Share of public R&D expenditures financed by industry, 1981-2003 (cont'd)

As a percentage of total national R&D expenditures of the sector

	Higher education						
	1981	1985	1991	1995	2001	2002	2003
Australia[1, 2, 3]	1.4	2.1	2.5	4.7	4.9 [-]	-	-
Austria[4]	1.0	1.7	-	-	1.8	-	-
Belgium[5]	9.4 [a]	8.7	15.4 [b]	13.2	12.7	-	-
Canada	4.1	4.3	7.0	8.1	9.3	9.3 [n]	9.3 [n]
Czech Republic	-	-	-	2.0 [a]	0.7	0.9	-
Denmark	0.7	1.0	1.6	1.9	3.0	4.2 [a]	-
Finland	2.1 [a]	-	3.6 [a]	5.7	6.7	6.2	-
France	1.3 [a]	1.9	4.2	3.3	3.1	-	-
Germany	1.8	5.4	7.0 [a]	8.2	12.2	12.2 [b]	11.3 [b]
Greece	0.0 [a]	-	6.1	5.6 [a]	6.9	-	-
Hungary	-	-	14.4	2.1	4.4	11.8	-
Iceland	1.2	0.6	5.0	5.4	10.9	-	-
Ireland[3]	7.1	6.9	8.6 [b]	6.9 [b]	5.3 [-]	-	-
Italy	2.7	1.5	4.0	4.7	-	-	-
Japan	1.5 [b]	2.4 [b]	3.7 [b]	3.6 [b]	2.3	2.6	-
Korea	-	-	-	22.4 [e]	14.3 [e]	13.9 [e]	-
Luxembourg[3]	-	-	-	-	-	-	-
Mexico	-	-	-	1.4	1.1	-	-
Netherlands	0.3	1.0	1.2	4.0	7.1	-	-
New Zealand	-	-	4.6	9.4	5.3	-	-
Norway	2.9	5.0	4.7	5.3	5.8	-	-
Poland	-	-	-	11.4	6.3	5.8	-
Portugal[6, 1, 2]	0.0	0.9	0.5	0.9 [a]	0.8	-	-
Slovak Republic	-	-	6.1 [q]	1.0 [m]	0.3	0.0	-
Spain	0.0	1.1	10.0	8.3	8.7 [b]	7.6	-
Sweden	2.3 [a]	5.5	5.2	4.6 [a,h]	5.5	-	-
Switzerland[1, 2, 7, 3]	9.5 [b]	3.3 [a,b]	1.8	6.2	5.1 [-]	-	-
Turkey[3]	-	-	10.4	16.1	19.4 [-]	-	-
United Kingdom	2.8 [a]	5.2 [a]	7.8	6.3	6.2	5.8	-
United States	3.3 [h]	4.5 [h]	5.3 [h]	5.5 [h]	5.5 [h]	4.9 [h,n]	4.5 [h,n]
Total OECD	**2.6** [b]	**3.8** [b]	**5.5** [a,b]	**5.8** [a,b]	**6.0** [b]	**5.8** [b,n]	**-**
EU-25	**-**	**-**	**-**	**6.0** [b]	**6.7** [b]	**-**	**-**
EU-15	**2.0** [a,b]	**3.7** [a,b]	**5.8** [a,b]	**5.9** [a,b]	**6.8** [b]	**-**	**-**
China[3]	-	-	-	-	32.4 [s]	-	-
Israel[3]	-	-	7.4 [e]	2.3 [e]	3.7 [e]	-	-
Russian Federation	-	-	-	27.5	26.5	27.2	-

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

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1. 1986 instead of 1985.
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5. 1983 instead of 1981.
6. 1982 instead of 1981.
7. 1996 instead of 1995.

Source: OECD, MSTI database, May 2004.

Table 17. Basic research expenditures, 1981-2003

	As a percentage of GDP						As a percentage of GERD					
	1981	1991	1995	2001	2002	2003	1981	1991	1995	2001	2002	2003
Australia[1, 2, 3]	0.33 [i,p]	0.43 [i]	0.43 [i]	0.40 [i]	-	-	35.1 [i,p]	28.3 [i]	25.9 [i]	26.0 [i]	-	-
Austria[4]	-	-	-	0.27 [a, k]	-	-	-	-	-	15.2 [a, k]	-	-
Czech Republic	-	-	0.17	0.53 [i]	0.49 [i]	-	-	- [c,q]	16.8 [c,q]	40.8 [i]	37.7 [i]	-
Denmark	-	-	-	0.44 [a]	-	-	-	-	-	18.3 [a]	-	-
France	-	0.48 [i]	0.51 [i]	0.52 [i]	-	-	- [a]	20.3 [i]	22.1 [i]	23.3 [i]	- [n]	-
Germany	0.46 [s]	0.47 [a]	-	-	-	-	18.9 [s]	18.7 [a]	-	-	-	-
Hungary[1]	-	0.23 [q]	0.18 [a]	0.24	0.25	-	-	22.1 [c,q]	24.7 [a,c]	25.3 [c]	24.5 [c]	-
Iceland	0.16	0.29 [i]	0.38 [i]	0.47 [i]	0.49 [b,i]	-	25.0	24.8 [i]	24.2 [i]	15.4 [i]	15.9 [i,b]	-
Ireland[3]	0.07	0.08	-	0.14 [i]	-	-	10.3	8.6 [b]	-	12.2 [i,b]	-	-
Italy	0.11 [r]	0.25 [a,i]	0.22 [i]	-	-	-	12.5 [r]	20.3 [a,i,a]	22.0 [i]	-	-	-
Japan	0.28 [e,i,j]	0.36 [i,j]	0.41 [i,j]	0.37 [i,k]	0.39 [i,k]	-	12.1 [e,i,j]	12.2 [i,j]	14.1 [i,j]	12.1 [i,k]	12.5 [i,k]	-
Korea	-	-	0.31	0.37 [e,i]	0.40 [e,i]	-	-	-	12.4 [e]	12.7 [e,i]	13.7 [e,i]	-
Mexico	-	-	0.09	0.12	-	-	-	-	29.0	30.8	-	-
Netherlands[4]	0.48 [a]	0.27 [i]	0.19 [a,i]	-	-	-	25.0 [a]	13.7 [i]	9.5 [a,i]	-	-	-
New Zealand	-	-	-	0.53 [i]	-	-	-	-	-	44.9 [a,i]	-	-
Norway	0.19	0.22	0.25	0.24	-	-	16.1	13.4	14.7 [a]	15.0	-	-
Poland	-	-	0.20 [a,m]	0.19 [m]	0.19 [b,m]	-	-	-	30.8 [a,m]	29.7 [m]	32.2 [b,m]	-
Portugal[5, 1]	0.05 [i]	0.15 [i]	0.14 [a,i,p]	0.19	-	-	16.7 [i]	24.6 [i]	24.6 [a,i,p,a]	22.4	- [b]	-
Slovak Republic	-	-	0.20 [c]	0.15	0.15	-	-	- [c,q]	21.5 [c]	23.4 [k]	25.9 [k]	-
Spain	0.06	0.13	0.17 [a]	0.15	0.16	-	14.6	15.5	21.0 [a]	15.8	15.5	-
Sweden	0.50 [a,k]	0.50 [k,p]	-	-	-	-	22.5 [a,k]	18.4 [k,p]	- [a,k]	- [k]	-	-
Switzerland[2, 3]	-	-	0.80 [i]	0.72 [i]	-	-	-	-	30.0 [i]	28.0 [i]	-	-
United States	0.32	0.46	0.40	0.47	0.49 [n]	0.50 [b,n]	13.7 [h]	16.9 [h]	15.9 [h]	17.2 [h]	18.4 [h,n]	19.1 [b,h,n]
China	-	0.03 [i,k]	0.03 [i,k]	0.06 [i]	0.07 [i]	-	-	4.1 [i,k]	5.0 [i,k]	5.6 [i]	5.7 [i]	-
Israel	-	-	-	0.89 [c,i,n]	0.89 [c,i,n]	-	-	-	-	17.7 [c,i,n]	18.9 [c,i,n]	-
Russian Federation[1]	-	0.07	0.13	0.15	0.17	-	-	9.5	15.3	12.9	13.7	-

Times series notes:

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Year availability:

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5. 1983 instead of 1981.
6. 1982 instead of 1981.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/345101246407

Table 18. Basic research by performer, 1991-2003

As a percentage of GDP

	Business enterprise					Government					Higher education					Private non-profit				
	1991	1995	2001	2002	2003	1991	1995	2001	2002	2003	1991	1995	2001	2002	2003	1991	1995	2001	2002	2003
Australia[1, 2, 3]	0.04	0.04	0.05 -	-	-	0.12	0.11	0.10 -	-	-	0.25	0.25 i	0.23 -	-	-	0.02	0.02	0.03 -	-	-
Austria[4]	-	-	0.04 a	-	-	-	-	0.02 a,k	-	-	-	-	0.21 a	-	-	-	-	0.00	-	-
Czech Republic	-	0.01 i	0.22 i	0.19 i	-	-	0.13 i	0.20 i	0.19 i	-	-	0.04 i	0.10 i	0.11 i	-	-	0.00	0.00	0.00	-
Denmark	-	-	0.08	-	-	0.05	0.08	0.07 a	0.03	-	0.20	0.25	0.28 a	0.34	-	0.01	0.01	0.01	0.01	-
France	0.06 i	0.06 i	0.05 a,i	-	-	0.09 i	0.11 i	0.09 i	-	-	0.32 i	0.33 i	0.37 i	-	-	0.01	0.01	0.01	-	-
Germany	0.09 a	0.07	0.08	-	-	0.12 a	-	-	-	-	0.26 a	-	-	-	-	-	-	-	-	-
Hungary[1]	0.02 c,q	0.01 a	0.01	0.02	-	0.13 c,q	0.10 a	0.11	0.13	-	0.09 c,q	0.07 a	0.11	0.10	-	-	-	-	-	-
Iceland	-	-	0.00	0.00	-	0.10 i	0.12 i,p	0.15 i	0.19 b,i	-	0.16 i	0.24 i,p	0.27 i	0.23 b,i	-	0.03	0.02	0.05	0.05 b	-
Ireland	0.02	-	0.04 i	-	-	0.00	0.00 b	-	-	-	0.06 b	0.08 b	0.10 b	-	-	0.00 b	0.00 b	-	-	-
Italy	0.02 a,i	0.02 i	0.03 i	0.03 i,n	0.03 i,n	0.09 a,i	0.08 i	0.06 i	0.09 i,n	0.08 i,n	0.14 i	0.13 i	-	-	-	-	-	-	-	-
Japan	0.14 i,j	0.13 i,j	0.13 i,k	0.14 i,k	-	0.04 j	0.05 a	0.09	0.09 i,k	-	0.18 j	0.14 a	0.16	0.16 i,k	-	0.02 j	0.02 a	0.01	0.01	-
Korea[2]	-	0.15 e	0.16 i	0.20 i	-	-	0.07 e	0.08 e,i	0.09 e,i	-	-	0.10 ei	0.12 ei	0.11 ei	-	-	0.01 e	0.00 e	0.00 e	-
Mexico	-	0.00	0.01	-	-	-	0.04	0.06	-	-	-	0.05	0.06	-	-	-	0.00	0.00	-	-
Netherlands	0.13 i	-	-	-	-	0.13 i	-	-	-	-	0.01 i	-	-	-	-	0.01	-	-	-	-
New Zealand	-	-	0.09 i	-	-	-	-	0.20 i	-	-	-	-	0.24 i	-	-	-	-	-	-	-
Norway	0.01	0.02 a	0.03	-	-	0.03	0.04	0.04	-	-	0.17	0.19	0.18	-	-	-	-	-	-	-
Poland	-	0.01 a,m	0.01 m	0.01 b,m	-	-	0.10 a,m	0.09 m	0.09 b,m	-	-	0.09 m	0.10 m	0.10 b,m	-	-	0.00	0.00	0.00	-
Portugal[1]	0.00	0.00 a,i,p	0.01	-	-	0.01	0.01 a,i,p	0.01	-	-	0.11	0.10 aip	0.14	-	-	0.02	0.03	0.03	-	-
Slovak Republic	-	0.03 c	0.03	0.03	-	-	0.13 c	0.08 c	0.09 c	-	-	0.04	0.04	0.03	-	-	-	0.00 k	0.00 k	-
Spain	0.02	0.02 a	0.02	0.02 a	-	0.03	0.03 a	0.03	0.03	-	0.08	0.11 a	0.10	0.11	-	0.00	0.00	0.00	0.00	-
Sweden	0.03 p	-	-	-	-	0.01 e,f	0.08 f	0.09 f	-	-	0.46	-	-	-	-	0.00 k	-	-	-	-
Switzerland[1, 2, 3]	0.16	0.19	0.20 -	-	-	0.00	0.00	0.00	0.00 f,i	-	-	0.55	0.47 -	-	-	0.00	0.06	0.04 -	-	-
Turkey	0.01	0.01 i	-	-	-	0.01	0.00 i	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	0.04 p	0.05 p	0.05 a	0.08	-	0.03 s	0.04	0.03 a	0.03	-	-	-	-	-	-	-	-	-	-	-
United States	0.13	0.08	0.08	0.08 n	0.08 b,n	0.04 f	0.04 f	0.04 f	0.04 f,n	0.04 b,f,n	0.25	0.24	0.28	0.30 n	0.31 b,n	0.04 h	0.04 h	0.06 h	0.07 h,n	0.07 b,h,n
China	0.00 i,k	0.00 i,k	0.00 i	0.00 i	-	0.02 i	0.02 i	0.04 i	0.04 i	-	0.01 i	0.01 i	0.02 i	0.03 i	-	-	-	-	-	-
Israel	-	-	0.19 c,i,n	0.17 c,i,n	0.17 c,i,n	-	-	0.05 c,i,n	0.05 c,i,n	-	-	-	0.61 e,i,n	0.62 e,i,n	-	-	-	0.04 c,n	0.05 c,n	-
Russian Federation[1]	0.01	0.02	0.02	0.02	-	0.05	0.09	0.11	0.13	-	0.02	0.02	0.02	0.02	-	0.00	0.00	0.00	0.00	-

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Source: OECD, MSTI database, May 2004.

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Table 19. Government budget appropriations and outlays for R&D by socio-economic objectives, 1991-2003

As a percentage of total R&D budget

	Defense			Civil														
				Economic development			Health			Space			Non-oriented programs			General university funds		
	1991	2001	2003	1991	2001	2003	1991	2001	2003	1991	2001	2003	1991	2001	2003	1991	2001	2003
Australia	10.3 f	5.8 f	5.7 f,n	25.8 f	36.8 f	34.3 f,n	14.6 f	16.4 f	19.9 f,n	-	0.0 f	0.0 f,n	15.0 f	3.1 f	3.7 f,n	34.4 f	37.9 f	36.4 f,n
Austria	0.0 f	0.0 f	0.0 f,n	14.6 f	15.8 f	12.7 f,n	8.6 f	8.8 f	8.5 f,n	0.4 f	0.1 f	0.1 f,n	12.4 f	13.7 f	13.1 f,n	64.0 f	61.5 f	65.5 f,n
Belgium	0.2	0.2	0.4 n	25.6	32.9	36.9 n	10.1	9.7	9.6 n	12.4	11.2	8.9 n	22.7	23.3	22.9 n	23.9	18.6	18.2 n
Canada	5.1 f	4.3 f	-	33.8 f	32.0 f	-	13.8 f	23.5 f	-	7.2 f	6.2 f	-	12.5 f	7.2 f	-	27.6 b,f	25.7 b,f	-
Czech Republic[1]	-	-	3.3 c	-	-	19.8 c	-	-	16.7 c	-	-	0.9 c	-	-	25.7 c	-	-	27.6 c
Denmark	0.6	0.5 a	1.1	26.3	21.1 a	16.5	14.1	19.8 a	16.7	2.7	2.4 a	2.2	23.3	18.0 a	20.6	33.0	37.4 a	42.1
Finland	1.4 a	1.6	2.9 n	40.4 a	41.1	39.1 n	16.3 a	15.4	15.2 n	3.1 a	1.9	1.9 n	10.5 a	14.2	13.7 n	28.3 a	25.9	27.2 n
France[1]	36.1	22.8 a	24.3 n	21.0	12.7	12.3 n	6.3	10.1	10.2 n	8.6	9.6	8.9 n	15.3	19.3	19.7 n	12.4	23.2	23.0 n
Germany	11.0 a	7.4	6.7 n	22.7 a	18.8 s	19.1 n,s	11.6 a	13.4 s	13.7 n,s	5.4 a	4.9 s	4.9 n,s	15.2 a	17.2 s	16.6 n,s	33.2 a	38.4 s	39.3 n,s
Greece[1]	1.5	0.8	0.9 n	29.7	20.8	18.0 n	17.5	19.8	19.0 n	0.3	0.2	0.1 n	3.4	12.5	10.9 n	46.1	45.6	50.7 n
Iceland	0.0	0.0	0.0 n	51.4	36.7	33.0 n	7.2	10.6	10.0 n	-	-	-	16.6	17.5	- n	24.9	35.2	38.4 n
Ireland	0.0	0.0	-	48.5	41.4	-	12.7	12.8	-	3.8	0.0	-	5.1	27.6	-	29.9	18.3	-
Italy	7.9	4.0 n	-	21.8	16.1 n	-	18.2	15.5 n	-	7.0	7.3 n	-	10.6	13.3 n	-	31.3	43.7 n	-
Japan	5.7 e,f,k	4.3 f,k	4.5	31.6 e,f	32.8 f	31.9 f,n	5.4 e,f	7.5 f	7.3 f,n	6.8 e,f	6.7 f	6.7	8.0 e,f	13.8 f	15.3 f,n	42.5 e,f	34.8 f	34.4 f,n
Korea	-	15.8	14.2	-	46.7	44.7	-	15.7	16.7	-	3.2	2.8	-	18.5 m	21.6	-	- l	-
Mexico	0.0 f	0.0	-	32.6 f	33.5	-	14.2 f	12.5	-	0.0 f	0.0	-	20.4 f	- l	-	32.8 f	53.9 m	-
Netherlands	3.0	1.9	-	28.1	25.3	-	8.7	8.7	-	2.6	2.6	-	10.6	10.7	-	43.0	46.3	-
New Zealand	1.5	-	-	46.7	-	-	25.3	-	-	-	-	-	1.2	-	-	24.1	-	-
Norway	6.2	7.5	6.9 n	31.5	26.1	21.2 n	18.3	18.8	18.8 n	2.7	2.2	1.9 n	10.5	8.9	12.2 n	30.8	36.4	39.0 n
Portugal	0.7	2.1	2.0 n	38.5	31.4	35.4 n	18.0	17.8	16.7 n	0.2	0.5	0.5 n	8.4	10.5	9.9 n	30.3	35.6	33.5 n
Slovak Republic[2]	-	9.3 m	7.2 m	-	29.2	21.3	-	10.9	10.2	-	- l	- l	-	32.4 m	- a,m	-	16.6	- l
Spain	16.8	37.3 b	-	27.5	22.7 b	-	15.1	9.7 b	-	7.0	2.4 b	-	10.8	2.1 b	-	20.0	25.8 b	-
Sweden	27.3	14.6	22.2	17.8	12.2	13.6	8.3	10.8	8.9	1.7	2.7	0.6	14.6	16.7	16.7	30.4	43.1	38.0
Switzerland[3, 4]	4.6 f	0.7 f	-	3.7 f,k	4.6 f,k	-	3.5 f,k	2.4 f,k	-	-	-	-	- l	- l	-	59.3 f,m	61.1 f,m	-
United Kingdom[1]	43.9	30.5	34.1 c	16.2	9.4	9.8 c	12.5	22.4	20.1 c	2.7	2.1	1.9 c	5.1	13.6	13.3 c	18.9	21.8	20.2 c
United States	59.7 f,g,h	50.5 f,g	53.7 b,f,g	8.9 f,g,h	6.5 f,g,l	5.6 b,f,g	17.5 f,g,h	26.2 f,g,l	26.3 b,f,g	9.9 f,g,h	9.8 f,g	8.4 b,f,g	4.0 f,g,h	6.9 f,g	6.0 b,f,g	-	-	-
Total OECD	**36.4 a**	**28.8 n**	**-**	**17.9 a**	**15.9 n**	**-**	**13.8 a**	**18.8 n**	**-**	**7.5 a**	**7.2 n**	**-**	**8.2 a**	**10.7 n**	**-**	**15.5 a**	**17.4 n**	**-**
EU-25	**-**	**14.9 a,n**	**-**	**-**	**16.8 a,n**	**-**	**-**	**13.5 a,n**	**-**	**-**	**5.2 a,n**	**-**	**-**	**14.8 a,n**	**-**	**-**	**31.6 a,n**	**-**
EU-15	**20.6 a**	**15.4 a,n**	**-**	**23.8 a**	**17.2 a,n**	**-**	**11.3 a**	**13.8 a,n**	**-**	**5.6 a**	**5.3 a,n**	**-**	**12.4 a**	**15.0 a,n**	**-**	**24.9 a**	**32.5 a,n**	**-**
Russian Federation	-	43.5	-	-	24.4	-	-	7.0	-	-	10.1	-	-	14.0	-	-	0.0	-

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Table 20. Tax treatment of R&D, 1990-2004

Rate of tax subsidies for 1 USD of R&D[1], large firms and SMEs

	SMEs			Large firms				
	1999	2001	2004	1990	1995	1999	2001	2004
Australia[2]	0.11	0.20	0.12	0.28	0.21	0.11	0.20	0.12
Austria	0.12	0.12	0.11	0.02	0.07	0.12	0.12	0.11
Belgium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Canada	0.32	0.32	0.32	0.17	0.17	0.17	0.17	0.17
Denmark[3]	-	0.11	0.18	0.00	0.13	-0.02 [4]	0.11	0.18
Finland	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01
France	0.09	0.06	0.13	0.09	0.08	0.09	0.06	0.13
Germany	-0.04	-0.02	-0.02	-0.05	-0.05	-0.04	-0.02	-0.02
Greece	-0.01	-0.01	-0.01	-	-	-0.01	-0.01	-0.01
Hungary[5]	-	-	0.16	-	-	-	-	0.16
Iceland	-0.03	-0.01	-0.01	-0.03	-	-0.03	-0.01	-0.01
Ireland	0.06	-	0.05	0.00	-	0.06	-	0.05
Italy	0.45	0.44	0.45	-0.04	-0.05	-0.03	-0.03	-0.03
Japan[6]	0.06	0.12	0.19	-0.02	-0.01	0.02	0.01	0.14
Mexico	0.03	0.03	0.39	-0.02	-0.02	0.03	0.03	0.39
Netherlands[7]	-	0.35	0.11	-0.02	0.10	0.10	0.10	0.02
New Zealand	-0.13	-0.02	-0.02	-	-	-0.13	-0.02	-0.02
Norway	-0.02	0.23	0.23	-0.04	-0.02	-0.02	-0.02	0.21
Portugal	0.15	0.34	0.28	-0.02	-0.02	0.15	0.34	0.28
Spain	0.31	0.44	0.44	0.25	0.28	0.31	0.44	0.44
Sweden	-0.01	-0.01	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01
Switzerland	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.01
United Kingdom	0.11	0.11	0.11	0.00	0.00	0.00	0.10	0.10
United States	0.07	0.07	0.07	0.09	-0.02	0.07	0.07	0.07

1. Tax subsidies are calculated as 1 minus the B-index. For example, in Australia in 2001, 1 dollar of R&D expenditure by large firms results in 20 cents of tax relief.

2. Calculation of Australia's B-index was adjusted to show the correct weights of the volume-based, 125% tax concession and the 175% incremental tax concession for R&D.

3. The 2004 calculation for Denmark applies to the 150% allowance on collaborative research at universities or public research institutions. Without this incentive, the B-index is 1.015.

4. 1998 instead of 1999.

5. The B-index for Hungary is based on the 100% R&D tax allowance for research and technology development (which also applies to subcontracted R&D if the partner is a public or non-profit research organization). A 300% allowance is available if the company's R&D laboratory is located at a university or public research site; the B-index in this situation equals 0.666.

6. The 2004 B-index for large firms in Japan applies to firms with a ratio of R&D to sales of less than 10%. The B-index for large firms with a R&D-to-sales ratio above 10% is 0.831. The B-index for research conducted in collaboration with universities is 0.782.

7. Calculations for the Netherlands were revised to reflect the taxability of the savings from the tax credit.

Source: OECD, 2004.

StatLink: http://dx.doi.org/10.1787/486405683434

Table 21. Total researchers per thousand employment, 1981-2002

	1981	1985	1991	1995	2001	2002
Australia[1, 2, 3]	3.6 [b]	4.3	6.8	7.2	7.3 [-]	-
Austria[4]	1.8	2.0 [k]	-	-	4.7 [k]	-
Belgium	3.5 [b,r]	4.1 [b,r]	4.8 [b,r]	6.1	7.8	-
Canada[3]	3.5	4.4	5.1	6.4	7.1 [b,n]	-
Czech Republic[1]	-	-	3.8 [b,c,j,q,r]	2.2 [b]	2.9 [b]	2.9 [b]
Denmark	2.8 [b,r]	3.4 [b,r]	4.6 [r]	6.1 [r]	7.0 [r]	-
Finland[5]	3.9 [r]	-	6.0 [r]	8.2 [r]	15.8 [r]	16.4 [r]
France	3.9 [a]	4.7	5.7	6.7	7.2	-
Germany	4.6	5.2	6.3 [a]	6.2	6.8	6.8 [b]
Greece	-	-	1.8 [b]	2.6 [a]	-	-
Hungary	-	-	3.2 [b,c]	2.9 [c]	3.8 [c]	3.9 [c]
Iceland	-	-	-	-	-	-
Ireland[3]	1.8 [b]	2.5 [b]	4.4 [b]	4.5 [b]	5.0 [a,b]	-
Italy	2.4	2.9	3.3	3.4	2.8	-
Japan	5.3 [j]	6.2 [j]	7.5 [j]	8.3 [j]	10.2	9.9 [b]
Korea	-	-	-	4.9 [e]	6.3 [e]	6.4 [e]
Luxembourg[3]	-	-	-	-	6.2 [-]	-
Mexico	-	-	-	0.6	-	-
Netherlands	3.4	4.3	-	4.8	5.5	-
New Zealand	-	-	4.0	4.7	6.9 [a]	-
Norway	3.8 [r]	4.8 [r]	6.6 [r]	7.5 [a,r]	8.7 [r]	-
Poland	-	-	-	3.4	3.8	3.9 [b]
Portugal[6, 7, 1]	0.8 [b]	1.1 [b]	2.1 [a,b,r]	2.6 [r]	3.5 [b,r]	-
Slovak Republic	-	-	-	4.6 [c]	4.7	4.6
Spain	1.6 [b]	1.8	2.9	3.5	5.0	5.1
Sweden	4.2 [a,k]	5.0 [k,r]	5.9 [k,r]	8.2	10.6	-
Switzerland[7, 1, 2, 3]	-	4.2 [a,b,r]	4.4	5.5	6.3 [-]	-
Turkey[3]	-	-	0.6	0.8 [b]	1.1 [b]	-
United Kingdom	4.9	5.0	4.6 [a]	5.4	-	-
United States	6.3	7.0 [a]	7.7	7.6	-	-
Total OECD[3]	**4.5 [b]**	**5.2 [a,b]**	**5.6 [a,b]**	**5.8 [a,b]**	**6.5 [b,n]**	**-**
EU-25	**-**	**-**	**-**	**4.9 [b]**	**5.6 [b]**	**-**
EU-15	**3.5 [b]**	**4.0 [b]**	**4.7 [a,b]**	**5.2 [b]**	**5.9 [b]**	**-**
China	-	-	0.7 [k]	0.8 [k]	1.0	1.1
Israel	-	-	-	-	-	-
Russian Federation	-	-	-	9.2	7.9	7.5

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991.
2. 1996 instead of 1995.
3. 2000 instead of 2001.
4. 1998 instead of 2001.
5. 1983 instead of 1981.
6. 1982 instead of 1981.
7. 1986 instead of 1985.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/730776281328

Table 22. Researchers by sector of performance, 1991-2002

Per thousand labour force

	Business sector				Government				Higher education				Private non-profit			
	1991	1995	2001	2002	1991	1995	2001	2002	1991	1995	2001	2002	1991	1995	2001	2002
Australia[1, 2, 3]	1.62	1.67	1.66	-	1.12	0.99	0.92 [-]	-	3.25	3.88	4.07	-	0.08	0.14	0.15	-
Austria[4]	-	-	3.01	-	-	-	0.25	-	-	-	1.53	-	-	-	0.02	-
Belgium	2.08 [b,r]	2.82	4.06 [b]	4.08 [b]	0.19 [b]	0.23	0.44	-	2.00 [b,r]	2.32 [r]	2.72 [b]	-	0.04 [b,r]	0.06 [r]	0.06 [b]	-
Canada	2.09	3.30	3.99	-	0.58	0.52	0.44	- [n]	1.99	2.08	2.12 [b,n]	-	0.04	0.03	0.02	-
Czech Republic	-	0.95	1.11	1.20	- [c,q]	0.83 [a]	0.94	0.86	-	0.52	0.82	0.83	-	0.00	0.03	0.01
Denmark	1.77	2.39	3.37	-	0.88	1.28	1.26	0.77	1.42	1.97	2.10	2.75 [a,r]	0.06	0.07	0.06	0.05
Finland	-	-	-	-	- [a]	-	-	-	-	-	-	-	-	-	-	-
France	2.37	2.61	3.28 [a]	-	1.03	1.07	0.85	- [n]	1.68	2.11	2.31	-	0.08	0.15	0.13	-
Germany	3.56 [a]	3.29	3.98	-	0.94 [a]	0.95 [b]	0.97	0.99 [b]	1.57 [a]	1.64	1.71	1.76 [b]	0.03 [a]	-	-	-
Greece	0.26	0.37	-	-	0.49	0.47 [a]	0.45 [b]	-	0.83	1.43 [a]	1.96	-	-	0.02	0.01	-
Hungary[1]	0.82	0.71	0.99	1.06	0.85 [c,q]	0.86 [c]	1.14 [c]	1.12 [c]	1.05	0.99	1.45	1.46	-	-	-	-
Iceland	1.19 [a]	2.41	5.24	-	2.06	2.17	2.61	-	1.53 [a]	2.55	3.16	-	0.11 [a]	0.09	0.42	-
Ireland	1.57	2.32	3.35	-	0.26 [b]	0.19 [b]	0.28	0.31	1.83 [b]	1.32 [b]	1.23	-	0.15 [b]	0.12 [b]	-	-
Italy	1.20	1.19	1.11	-	0.51 [a]	0.61	0.54	-	1.34	1.51	1.14	-	-	-	-	-
Japan	5.24	5.76	6.38	6.45	0.46 [b,j]	0.46 [b,j]	0.50	0.51	1.65	1.82	2.97	2.55	0.21	0.24	0.16	0.16
Korea	-	3.23	4.47	4.55	- [e]	0.61 [e]	0.54 [e]	0.50 [e]	-	0.93 [e]	1.03 [e]	1.09 [e]	-	0.05 [e]	0.05 [e]	0.06
Luxembourg[3]	-	-	5.24	-	-	-	0.76 [-]	-	-	-	0.08	-	-	-	-	-
Mexico	-	0.06	-	-	-	0.17	-	-	-	0.32	-	-	-	0.01	-	-
Netherlands	-	1.79	2.75	-	-	1.06	0.83	0.82	1.78	1.68	1.93	-	-	0.06	0.04	0.03
New Zealand	0.83	0.88	1.30 [a]	-	0.93	0.84	1.02 [a]	-	1.14	1.69	2.89 [a]	-	-	-	-	-
Norway	-	-	4.78	-	-	-	1.31	-	1.95	2.28	2.40	-	-	-	-	-
Poland	-	0.65	0.55	0.27	-	0.65 [a]	0.61	0.85	-	1.63	2.10	2.16	-	0.00	0.00	0.00
Portugal[1]	0.21 [a]	0.23 [a]	0.51	-	0.42	0.58	0.68	-	1.13 [a]	1.23 [a]	1.68	-	0.24 [a]	0.41 [a]	0.45	-
Slovak Republic	-	0.85 [c]	0.85	0.83	- [b,c,q]	1.48 [c]	0.92 [k]	0.91 [k]	-	1.60	1.84	1.76	-	-	0.00	0.00
Spain	0.73	0.66	1.06	1.34 [a]	0.51	0.51	0.75	0.69	1.31	1.69	2.63	2.49	0.01	0.03	0.05	0.02
Sweden	2.93 [k]	4.34 [a]	6.25	-	0.38 [k]	0.62 [a,k]	0.51 [k]	-	2.52	2.70	3.55	-	0.01 [e]	-	-	-
Switzerland[1, 2, 3]	2.37	3.04	3.86	-	0.15	0.14	-	0.11	1.76 [a]	2.09	2.18	-	-	-	-	-
Turkey[3]	0.06	0.10	0.16 [a]	-	0.09	0.08	0.11 [-]	-	0.41	0.54	0.75 [a]	-	-	-	-	-
United Kingdom	2.78	2.88	3.16 [a]	3.50	0.52	0.48	0.34	0.31	1.01	1.65	-	-	0.10	0.11	0.13	0.14
United States[3]	6.04	5.89	7.20 [n]	-	0.45 [h]	0.40 [h]	-	-	1.08	1.35	-	-	0.07	0.08 [k]	-	-
Total OECD	**3.51**	**3.44**	**-**	**-**	**0.54** [a,b]	**0.43** [a,b]	**-**	**-**	**1.24**	**1.14**	**-**	**-**	**0.07**	**0.06**	**-**	**-**
EU-25	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
EU-15	**2.22**	**2.32**	**-**	**-**	**0.71** [a,b]	**0.74**	**-**	**-**	**1.45**	**1.75**	**-**	**-**	**0.05**	**0.08**	**-**	**-**
China	0.19 [k,s]	0.28 [k,s]	0.53	0.59	0.31 [k]	0.27 [k]	0.25	0.25	0.20 [s]	0.19 [s]	0.23	0.24	-	-	-	-
Israel	-	5.05	4.02	3.81	-	2.16	2.05	2.01	-	1.15	1.06	0.96	-	0.00	0.03	0.02

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1992 instead of 1991. 2. 1996 instead of 1995. 3. 2000 instead of 2001. 4. 1998 instead of 2001.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/178788378577

Table 23. Human resources in science and technology, 1995-2002

	HRST	
	Average annual growth rate, 1995-2002	As a percentage of total employment, 2002
Australia	3.07 [1]	35.6 [2]
Austria	2.08 [3]	24.7 [2]
Belgium	2.23 [3]	30.1 [2]
Canada	3.00	29.0
Czech Republic	1.69	29.7
Denmark	3.46	35.3
Finland	2.32 [4]	32.5
France	2.11	29.2
Germany	2.04 [3]	33.5 [2]
Greece	2.65	19.7
Hungary	-1.03 [5]	23.9 [2]
Iceland	5.60 [5]	29.0 [2]
Ireland	7.05	22.4
Italy	4.26	28.4
Japan[6]	-	15.7
Korea	3.40	16.2
Luxembourg	5.43 [3]	31.6 [2]
Netherlands	3.90	34.3
New Zealand	3.06 [1]	26.0 [2]
Norway	7.64 [5]	34.7 [2]
Poland	-1.14 [5]	23.5 [2]
Portugal	-0.64	14.8
Slovak Republic	1.03 [7]	28.8
Spain	8.36	23.1
Sweden	3.37 [4]	37.7
Switzerland	1.04 [7]	36.1
United Kingdom	2.49	25.3
United States	2.00	32.7

1. 1996-2001 instead of 1995-2002.
2. 2001 instead of 2002.
3. 1995-2001 instead of 1995-2002.
4. 1997-2001 instead of 1995-2002.
5. 1999-2001 instead of 1995-2002.
6. Data for Japan are national estimates.
7. 1999-2002 instead of 1995-2002.

Source: OECD, *Science, Technology and Industry Scoreboard 2003* .

StatLink: http://dx.doi.org/10.1787/053853630826

Table 24. University graduates in science and engineering, 1988-2001

Tertiary A level and advanced research programmes

	Thousand of graduates						As a percentage of total graduates						Share of women					
	Science			Engineering			Science			Engineering			Science			Engineering		
	1998	2000	2001	1998	2000	2001	1998	2000	2001	1998	2000	2001	1998	2000	2001	1998	2000	2001
Australia	17.2	17.5	19.7	11.8	11.8	12.4	11.5	11.8	11.9	7.9	7.9	7.5	8.4	8.6	8.5	2.9	3.0	2.9
Austria	2.2	1.7	1.7	2.4	3.0	3.5	13.7	9.9	9.1	14.7	17.3	18.7	9.3	7.0	7.4	5.0	6.7	6.7
Belgium[1]	1.5	3.2	3.7	2.6	4.0	4.3	8.3	9.9	10.9	14.6	12.5	12.5	6.9	7.5	8.2	6.3	5.3	5.1
Canada	17.5	18.9	-	12.0	12.6	-	11.7	12.2	-	8.0	8.2	-	8.9	9.6	-	3.1	3.2	-
Czech Republic	1.3	3.8	4.2	5.0	4.6	4.5	5.9	12.7	11.9	22.3	15.5	12.8	3.2	6.3	5.3	9.9	8.3	7.5
Denmark[2]	1.6	1.9	2.2	1.2	1.4	3.0	12.9	12.6	6.7	9.8	8.9	9.0	10.9	10.7	4.5	5.8	4.7	3.4
Finland	1.8	2.2	2.2	5.5	6.7	6.4	8.0	7.9	7.2	24.2	24.0	20.8	6.5	6.2	5.3	7.9	7.7	6.5
France	56.8	65.2	67.0	46.1	40.6	41.3	15.9	18.0	18.2	12.9	11.2	11.2	13.8	13.8	14.2	5.0	4.8	4.7
Germany	31.5	27.6	26.2	43.0	38.8	36.4	14.7	13.5	13.2	20.1	19.0	18.4	10.6	9.5	9.5	7.6	8.3	8.2
Hungary	2.0	1.4	1.4	5.9	5.8	4.2	4.5	2.3	2.5	13.5	9.8	7.4	3.6	1.3	1.3	5.5	3.6	3.3
Iceland	0.1	0.2	0.2	0.1	0.1	0.1	13.1	10.7	11.0	5.9	7.1	6.5	8.1	7.8	8.2	2.3	2.6	2.1
Ireland	3.9	5.4	5.5	2.3	2.5	2.2	16.9	19.7	19.4	10.0	9.3	7.9	14.9	16.8	15.9	3.9	3.9	3.5
Italy	18.3	15.8	15.6	25.1	29.7	31.0	11.1	8.5	8.0	15.2	16.0	15.9	11.6	8.4	7.8	7.6	7.9	7.8
Japan	26.3	26.7	28.8	127.7	129.7	133.5	4.4	4.4	4.6	21.6	21.3	21.2	3.0	3.0	3.1	4.9	5.3	5.8
Korea	24.4	27.2	33.3	62.7	67.4	74.3	11.0	11.1	12.2	28.2	27.4	27.2	11.6	11.7	12.3	14.4	14.3	13.6
Luxembourg	-	0.1	-	-	-	-	-	31.5	-	-	-	-	-	-	-	-	-	-
Mexico	6.5	25.8	29.0	51.8	40.4	41.1	2.8	9.0	9.7	22.0	14.0	13.8	2.8	8.0	8.4	14.5	6.0	6.2
Netherlands	4.8	3.6	4.1	10.1	7.8	8.3	5.7	4.8	5.2	12.1	10.4	10.5	3.0	2.5	2.7	2.8	2.4	2.4
New Zealand	3.6	4.1	4.5	1.8	1.8	1.8	13.3	13.0	14.1	6.9	5.6	5.5	10.2	9.7	10.4	3.7	3.0	2.9
Norway	1.3	1.6	1.9	3.1	1.8	2.4	3.8	6.3	6.8	9.0	6.8	8.3	1.9	2.9	3.2	3.7	2.9	3.0
Poland	3.4	11.7	15.0	23.5	27.6	29.8	1.5	3.4	3.5	10.4	8.0	7.0	0.3	3.4	3.1	0.8	3.0	2.6
Portugal	-	3.0	-	-	6.6	-	-	5.7	-	-	12.4	-	-	4.1	-	-	6.6	-
Slovak Republic[2]	1.6	1.4	2.3	2.8	3.2	4.3	8.5	6.8	9.4	14.8	15.4	17.8	4.8	4.0	6.2	7.6	8.8	10.8
Spain	20.1	21.7	22.8	24.0	27.6	30.8	9.4	10.2	10.4	11.2	12.9	14.2	7.3	8.1	8.1	4.9	6.0	6.9
Sweden	3.0	3.2	3.6	5.4	7.8	8.3	9.0	8.5	9.4	16.2	20.5	21.5	5.4	6.7	7.5	6.2	8.6	10.1
Switzerland	2.6	3.9	4.0	3.8	4.2	3.7	11.4	14.5	15.0	17.0	15.7	14.1	8.2	9.3	9.0	5.1	4.6	4.3
Turkey	13.5	14.3	16.3	14.3	17.5	18.1	10.5	10.9	10.4	11.1	13.3	11.6	12.2	12.5	12.1	6.6	7.8	6.7
United Kingdom	54.2	64.7	77.0	46.5	39.0	44.7	14.5	16.5	18.1	12.4	9.9	10.5	11.4	13.3	14.6	4.3	3.6	3.7
United States	158.3	169.7	173.4	120.6	117.7	118.3	9.2	9.3	9.4	7.0	6.5	6.4	7.2	7.3	7.3	2.4	2.4	2.4
Total OECD[1, 2, 3]	**510.9**	**544.3**	**565.5**	**657.4**	**654.9**	**668.6**	**9.6**	**9.8**	**10.0**	**12.4**	**11.8**	**11.8**	**7.7**	**8.0**	**8.0**	**4.2**	**4.4**	**4.5**
EU-25[1, 2, 3]	**211.6**	**234.4**	**254.5**	**258.2**	**250.0**	**263.0**	**11.1**	**11.6**	**11.6**	**13.6**	**12.3**	**12.0**	**9.4**	**9.0**	**8.9**	**5.4**	**5.0**	**4.9**
EU-15[1, 2, 3]	**198.6**	**216.2**	**231.7**	**220.1**	**208.8**	**220.2**	**12.9**	**13.7**	**14.1**	**14.3**	**13.3**	**13.4**	**10.4**	**10.8**	**11.1**	**5.6**	**5.5**	**5.6**
Israel	-	4.0	4.6	-	3.3	3.8	-	10.3	11.5	-	8.5	9.6	-	7.3	8.4	-	3.3	3.7

1. Flemish Community only instead of Belgium in 1998.

2. 1999 instead of 1998.

3. Do not include Greece, Luxembourg, Portugal and Spain.

Source: OECD, Education database, July 2004.

StatLink: http://dx.doi.org/10.1787/831562532438

Table 25. Triadic[1] patent families by priority year, 1991-2000

	Number of triadic patent families					Average annual growth rate 1991-2000	As a percentage of total world triadic patent families				
	1991	1995	1997	1999	2000		1991	1995	1997	1999	2000
Australia	156	226	299	304 b,n	321 b,n	8.0	0.5	0.6	0.7	0.7 b,n	0.7 b,n
Austria	174	217	248	262 b,n	274 b,n	5.0	0.6	0.6	0.6	0.6 b,n	0.6 b,n
Belgium	239	369	395	366 b,n	359 b,n	4.5	0.8	1.0	0.9	0.8 b,n	0.8 b,n
Canada	275	382	525	539 b,n	519 b,n	7.1	0.9	1.1	1.2	1.2 b,n	1.2 b,n
Czech Republic	9	3	10	9 b,n	9 b,n	-0.6	0.0	0.0	0.0	0.0 b,n	0.0 b,n
Denmark	105	188	221	250 b,n	254 b,n	9.8	0.4	0.5	0.5	0.6 b,n	0.6 b,n
Finland	161	312	416	419 b,n	489 b,n	12.4	0.5	0.9	1.0	1.0 b,n	1.1 b,n
France	1 783	1 905	2 200	2 081 b,n	2 127 b,n	2.0	6.0	5.4	5.2	4.8 b,n	4.9 b,n
Germany	3 676	4 815	5 634	5 867 b,n	5 777 b,n	5.0	12.3	13.6	13.4	13.4 b,n	13.2 b,n
Greece	5	1	9	4 b,n	6 b,n	2.0	0.0	0.0	0.0	0.0 b,n	0.0 b,n
Hungary	22	25	31	30 b,n	33 b,n	4.6	0.1	0.1	0.1	0.1 b,n	0.1 b,n
Iceland	3	6	4	5 b,n	4 b,n	3.7	0.0	0.0	0.0	0.0 b,n	0.0 b,n
Ireland	27	31	37	56 b,n	45 b,n	5.8	0.1	0.1	0.1	0.1 b,n	0.1 b,n
Italy	659	610	711	740 b,n	767 b,n	1.7	2.2	1.7	1.7	1.7 b,n	1.8 b,n
Japan	8 895	9 428	11 207	11 726 b,n	11 757 b,n	3.1	29.7	26.6	26.6	26.9 b,n	26.9 b,n
Korea	93	327	387	459 b,n	478 b,n	18.2	0.3	0.9	0.9	1.1 b,n	1.1 b,n
Luxembourg	9	13	16	19 b,n	17 b,n	6.4	0.0	0.0	0.0	0.0 b,n	0.0 b,n
Mexico	6	12	11	11 b,n	15 b,n	10.2	0.0	0.0	0.0	0.0 b,n	0.0 b,n
Netherlands	568	724	840	833 b,n	857 b,n	4.6	1.9	2.0	2.0	1.9 b,n	2.0 b,n
New Zealand	19	20	39	33 b,n	36 b,n	7.1	0.1	0.1	0.1	0.1 b,n	0.1 b,n
Norway	58	86	94	108 b,n	109 b,n	7.0	0.2	0.2	0.2	0.2 b,n	0.2 b,n
Poland	9	5	9	8 b,n	10 b,n	0.5	0.0	0.0	0.0	0.0 b,n	0.0 b,n
Portugal	3	2	6	5 b,n	8 b,n	10.2	0.0	0.0	0.0	0.0 b,n	0.0 b,n
Slovak Republic[2]	1	2	4	3 b,n	4 b,n	23.2	-	0.0	0.0	0.0 b,n	0.0 b,n
Spain	70	87	108	120 b,n	113 b,n	5.3	0.2	0.2	0.3	0.3 b,n	0.3 b,n
Sweden	391	700	853	838 b,n	811 b,n	8.1	1.3	2.0	2.0	1.9 b,n	1.9 b,n
Switzerland	723	746	790	792 b,n	753 b,n	0.5	2.4	2.1	1.9	1.8 b,n	1.7 b,n
Turkey	0	2	3	5 b,n	6 b,n	34.5	0.0	0.0	0.0	0.0 b,n	0.0 b,n
United Kingdom	1 250	1 516	1 589	1 767 b,n	1 794 b,n	4.0	4.2	4.3	3.8	4.0 b,n	4.1 b,n
United States	10 217	12 312	14 763	15 079 b,n	14 985 b,k,n	4.3	34.1	34.7	35.1	34.6 b,n	34.3 b,n
Total OECD	**29 607**	**35 070**	**41 459**	**42 738 b,n**	**42 739 b,k,n**	**4.1**	**98.9**	**98.8**	**98.5**	**97.9 b,n**	**97.9 b,n**
EU-25	**9 168**	**11 533**	**13 343**	**13 687 b,n**	**13 770 b,n**	**4.5**	**30.6**	**32.5**	**31.7**	**31.4 b,n**	**31.5 b,n**
EU-15	**9 122**	**11 489**	**13 283**	**13 627 b,n**	**13 699 b,n**	**4.5**	**30.5**	**32.4**	**31.6**	**31.2 b,n**	**31.4 b,n**
Total world	**29 923**	**35 501**	**42 097**	**43 635 b,n**	**43 664 b,n**	**4.2**	**100**	**100**	**100**	**100 b,n**	**100 b,n**
China	12	19	41	66 b,n	93 b,n	22.9	0.0	0.1	0.1	0.2 b,n	0.2 b,n
Israel	104	158	284	347 b,n	342 b,n	13.2	0.3	0.4	0.7	0.8 b,n	0.8 b,n
Russian Federation	37	62	65	71 b,n	76 b,n	7.9	0.1	0.2	0.2	0.2 b,n	0.2 b,n

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. Patent filed at the European Patent Office (EPO), the US Patent & Trademark Office (USPTO) and the Japanese Patent Office (JPO).

2. 1992 instead of 1991.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/482445177814

Table 26. Number of triadic[1] patent families by priority year, 1991-2000

Per million inhabitants

	1991	1993	1995	1997	1999	2000
Australia	9.0	10.8	12.4	16.0	16.0 b,n	16.7 b,n
Austria	22.3	21.7	27.3	31.1	32.7 b,n	34.2 b,n
Belgium	23.9	32.6	36.4	38.8	35.8 b,n	35.1 b,n
Canada	9.8	10.5	13.0	17.5	17.7 b,n	16.9 b,n
Czech Republic	0.9	0.7	0.3	0.9	0.9 b,n	0.9 b,n
Denmark	20.4	30.7	35.9	41.9	47.0 b,n	47.7 b,n
Finland	32.1	48.3	61.0	80.9	81.1 b,n	94.5 b,n
France	30.5	28.7	32.1	36.8	34.5 b,n	35.1 b,n
Germany	46.0 a	49.1	59.0	68.7	71.5 b,n	70.3 b,n
Greece	0.5	0.3	0.1	0.8	0.4 b,n	0.6 b,n
Hungary	2.1	2.2	2.4	3.0	2.9 b,n	3.3 b,n
Iceland	11.6	3.8	22.4	12.9	17.2 b,n	14.9 b,n
Ireland	7.6	5.2	8.6	10.1	14.8 b,n	11.9 b,n
Italy	11.6	11.0 a	10.6	12.4	12.8 b,n	13.3 b,n
Japan	71.8	67.8	75.1	88.8	92.6 b,n	92.6 b,n
Korea	2.1	3.8	7.2	8.4	9.8 b,n	10.2 b,n
Luxembourg	24.1	36.1	31.8	37.8	44.2 b,n	37.8 b,n
Mexico	0.1	0.1	0.1	0.1	0.1 b,n	0.1 b,n
Netherlands	37.7	39.0	46.8	53.9	52.7 b,n	53.8 b,n
New Zealand	5.3	3.1	5.5	10.2	8.5 b,n	9.2 b,n
Norway	13.6	16.3	19.7	21.4	24.2 b,n	24.2 b,n
Poland	0.2	0.3	0.1	0.2	0.2 b,n	0.3 b,n
Portugal	0.3	0.4	0.2	0.6	0.5 b,n	0.8 b,n
Slovak Republic[2]	0.1	0.2	0.4	0.8	0.6 b,n	0.8 b,n
Spain	1.8	1.9	2.2	2.8	3.0 b,n	2.8 b,n
Sweden	45.4	57.5	79.3	96.5	94.6 b,n	91.4 b,n
Switzerland	105.0	101.0	105.4	111.1	110.5 b,n	104.5 b,n
Turkey	0.0	0.0	0.0	0.1	0.1 b,n	0.1 b,n
United Kingdom	21.8	23.5	26.2	27.3	30.2 b,n	30.6 b,n
United States	40.3	40.5	46.2	54.1	54.0 b,n	53.1 b,k,n
Total OECD	**31.3** a	**31.4**	**32.2** a	**37.5**	**38.1** b,n	**37.8** b,k,n
EU-25	**-**	**-**	**25.8**	**29.7**	**30.4** b,n	**30.4** b,n
EU-15	**24.9** a	**26.4** a	**30.8**	**35.5**	**36.2** b,n	**36.2** b,n
China	0.0	0.0	0.0	0.0	0.1 b,n	0.1 b,n
Israel	21.1	23.3	28.5	48.8	56.7 b,n	54.5 b,n
Russian Federation	0.2	0.2	0.4	0.4	0.5 b,n	0.5 b,n

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. Patent filed at the EPO, the USPTO and the JPO.

2. 1992 instead of 1991.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/366528340153

Table 27. Science and engineering articles by country, 1988-2001

Per million inhabitants

	1988	1991	1995	1999	2000	2001
Australia	593	618	736	797	763	758
Austria	294	353	437	527	532	564
Belgium	362	416	519	580	560	582
Canada	798	817	836	768	743	727
Czech Republic[1]	265	279	193	231	239	256
Denmark	672	733	843	923	923	931
Finland	564	640	809	943	942	983
France	372	402	493	532	511	514
Germany[2]	477	412	467	531	529	530
Greece	121	153	194	249	265	304
Hungary	164	175	177	226	224	243
Iceland	276	403	591	491	548	610
Ireland	224	260	336	406	420	432
Italy	198	243	312	361	364	385
Japan	-	-	-	-	437	451
Korea	18	31	84	180	200	233
Mexico	11	13	21	30	30	32
Netherlands	581	671	798	800	783	786
New Zealand	620	598	665	760	784	742
Norway	521	564	678	701	711	721
Poland	106	102	117	134	138	147
Portugal	43	65	99	174	177	208
Slovak Republic	-	-	212	185	186	177
Spain	140	187	289	375	370	387
Sweden	898	945	1 052	1 143	1 106	1 159
Switzerland	797	886	1 040	1 158	1 173	1 117
Turkey	9	15	28	49	52	60
United Kingdom	641	696	794	837	844	807
United States	725	766	762	711	696	705
Total OECD	**468**	**454**	**447**	**466**	**461**	**468**
EU-25	**-**	**-**	**432**	**482**	**479**	**485**
EU-15	**389**	**416**	**499**	**555**	**550**	**556**
China[3]	-	5	8	13	14	16
Israel	-	985	1 068	994	1 004	1 007
Russian Federation[4]	-	-	135	118	126	110

1. Includes articles from the former Czechoslavakia before 1996.
2. Includes articles from the former East Germany before 1992.
3. Includes articles from the Hong Kong economy before 2000.
4. Includes articles from the former USSR.

Source: NSF, *Science and Engineering Indicators* 2004. Population from OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/871586367658

Table 28. Portfolio of S&E articles by field, 1988-2001

As a percentage of total publications

	All fields (total number)		Clinical medicine		Biomedical research		Biology		Chemistry		Physics		Earth & space sciences		Engineering & technology		Mathematics		Psychology		Social sciences		Other[1]	
	1988	2001	1988	2001	1988	2001	1988	2001	1988	2001	1988	2001	1988	2001	1988	2001	1988	2001	1988	2001	1988	2001	1988	2001
Australia	9 896	14 788	29.9	28.7	13.8	13.1	16.1	14.7	8.2	6.8	7.1	6.9	6.3	7.8	4.5	6.6	2.2	1.7	5.2	4.8	3.3	3.7	3.4	5.3
Austria	2 241	4 526	42.1	42.5	10.6	13.0	6.3	5.6	13.8	10.0	12.4	11.3	2.5	4.6	4.4	6.1	2.4	2.7	2.8	2.2	1.4	1.2	1.3	0.9
Belgium	3 586	5 984	38.4	32.9	17.1	14.6	5.4	8.0	10.4	11.0	11.9	12.5	3.0	4.5	5.5	7.8	2.3	2.1	2.8	2.7	1.7	2.0	1.6	2.0
Canada	21 391	22 626	25.9	29.3	14.3	15.2	14.6	10.3	8.1	7.8	8.0	6.6	5.8	7.3	8.1	7.9	2.3	1.9	4.6	4.7	4.4	4.4	3.9	4.6
Czech Republic[2]	2 746	2 622	16.5	14.5	13.9	16.0	4.6	7.7	29.0	22.9	14.5	16.2	3.6	4.5	5.3	8.2	1.5	3.9	7.9	3.1	2.9	1.5	0.4	1.3
Denmark	3 445	4 988	54.6	34.2	15.9	17.9	6.0	11.7	4.8	7.8	8.6	9.3	2.6	6.2	2.3	5.3	1.7	1.4	1.7	3.3	1.1	1.0	0.8	1.9
Finland	2 789	5 098	51.1	37.8	14.3	14.1	7.1	10.1	6.1	7.5	7.0	8.5	3.7	5.5	4.3	7.3	1.8	1.3	1.6	1.8	1.4	1.8	1.7	3.9
France	21 409	31 317	29.1	27.1	16.6	15.2	5.9	5.7	15.3	12.9	17.2	16.1	4.7	6.6	4.7	9.0	3.0	4.4	1.8	1.4	1.1	0.9	0.5	0.7
Germany[3]	25 666	43 623	29.0	30.9	15.4	14.1	6.2	5.2	15.7	12.7	16.5	16.3	3.3	5.0	6.7	8.5	2.2	2.2	1.8	1.8	2.3	2.0	1.0	1.3
Greece	1 239	3 329	20.4	31.3	8.1	8.1	9.3	9.2	14.7	12.5	16.3	14.1	7.9	6.3	14.7	11.4	4.3	3.0	2.4	2.1	0.6	0.5	1.1	1.5
Hungary	1 714	2 479	21.2	26.7	19.5	13.1	3.7	5.2	27.3	23.5	12.0	15.0	1.7	2.8	4.3	7.0	6.2	3.9	2.2	1.6	0.7	0.8	1.2	0.4
Iceland	69	174	45.0	31.9	12.3	10.2	6.2	16.2	0.0	3.3	3.4	4.6	17.6	16.2	2.2	2.9	2.2	2.1	1.5	5.8	3.6	3.9	6.1	3.0
Ireland	790	1 665	35.8	30.7	11.9	14.6	11.9	14.0	9.2	8.4	8.7	10.3	4.7	3.0	3.9	6.9	4.5	2.4	5.8	4.1	1.5	1.7	2.2	4.1
Italy	11 229	22 313	38.0	35.1	13.4	12.0	3.8	4.5	15.4	11.9	16.2	16.2	3.6	6.0	5.2	8.8	2.3	2.9	1.0	1.3	0.8	0.7	0.4	0.6
Japan	34 435	57 420	25.6	28.7	15.2	14.0	6.9	6.1	17.7	14.9	19.1	19.1	1.9	3.0	11.1	11.6	1.4	1.4	0.5	0.5	0.5	0.5	0.1	0.2
Korea	771	11 037	10.0	17.9	4.6	11.3	3.7	3.3	30.5	17.7	18.2	22.4	1.5	3.0	24.9	20.7	2.7	1.7	2.5	1.0	0.1	0.3	1.3	0.8
Mexico	884	3 209	24.5	18.7	14.9	12.0	15.7	14.8	11.1	10.5	15.7	21.2	6.5	7.6	4.0	7.7	3.4	2.1	2.7	1.7	1.2	1.5	0.5	2.3
Netherlands	8 581	12 602	36.6	37.5	15.5	14.2	8.2	6.0	10.8	8.6	11.9	8.8	4.1	5.5	4.3	6.4	1.5	1.4	2.7	3.9	2.7	3.6	1.6	4.0
New Zealand	2 075	2 903	28.4	25.9	10.1	10.5	28.6	23.6	6.1	5.7	4.6	4.2	6.1	9.3	3.8	5.2	1.5	1.8	3.2	4.4	4.6	4.4	2.9	5.0
Norway	2 192	3 252	40.3	33.4	13.8	12.7	12.8	12.9	8.0	6.3	4.9	5.0	6.4	10.1	4.4	6.2	2.1	2.3	3.9	4.4	2.2	3.1	1.2	3.7
Poland	4 030	5 686	12.4	13.2	9.3	8.6	5.3	4.8	27.1	26.7	28.4	26.5	1.9	4.1	9.1	11.0	4.4	3.9	1.0	0.5	0.6	0.3	0.7	0.5
Portugal	429	2 142	15.7	14.5	11.4	12.5	6.4	11.0	17.6	20.5	20.1	16.8	5.0	4.7	16.0	13.1	2.4	3.5	2.2	1.4	0.9	0.9	2.4	1.1
Slovak Republic	-	955	-	12.2	-	17.5	-	4.8	-	22.5	-	15.9	-	3.4	-	8.5	-	3.4	-	8.2	-	3.2	0.0	0.4
Spain	5 432	15 570	23.3	24.7	18.8	13.9	8.9	10.7	23.8	18.5	12.4	11.7	3.3	5.7	4.2	7.8	3.1	3.3	1.1	1.7	0.7	0.9	0.4	1.0
Sweden	7 573	10 314	48.2	36.7	17.2	15.5	6.9	7.4	7.5	8.3	7.5	10.5	3.2	4.4	3.9	8.1	1.2	1.2	1.8	1.9	1.2	1.7	1.4	4.2
Switzerland	5 316	8 107	36.3	32.7	18.5	16.1	4.1	5.8	11.9	12.8	16.5	13.4	2.7	6.4	4.2	6.6	1.6	1.4	1.7	2.1	1.7	1.4	0.9	1.3
Turkey	507	4 098	33.1	44.3	6.0	6.3	5.4	5.2	15.8	14.2	12.4	8.9	6.2	4.6	13.4	11.2	3.3	1.3	2.6	1.9	0.9	1.1	1.1	1.1
United Kingdom	36 509	47 660	36.6	32.8	14.8	14.2	7.4	6.2	9.9	8.5	9.1	9.0	4.0	5.9	6.3	7.4	1.5	1.6	4.5	5.7	2.4	3.0	3.7	5.7
United States	177 662	200 870	31.0	31.7	15.5	16.9	7.2	6.2	7.4	7.1	10.1	8.7	4.5	5.6	6.7	6.9	2.2	1.8	4.9	4.7	4.0	3.9	6.4	6.4
Total OECD	**398 238**	**551 402**	**31.1**	**30.7**	**15.2**	**15.0**	**7.7**	**6.8**	**10.8**	**10.3**	**12.0**	**11.9**	**4.1**	**5.4**	**6.7**	**8.2**	**2.1**	**2.0**	**3.7**	**3.3**	**2.8**	**2.6**	**3.8**	**3.8**
EU-25[4]	**143 034**	**138 116**	**21.2**	**10.6**	**14.2**	**7.0**	**5.2**	**3.3**	**24.2**	**26.7**	**16.9**	**32.6**	**2.8**	**4.9**	**6.2**	**8.9**	**3.6**	**3.8**	**3.4**	**0.9**	**1.4**	**0.5**	**0.9**	**0.7**
EU-15[4]	**134 544**	**137 368**	**34.8**	**28.2**	**14.3**	**12.7**	**7.2**	**7.6**	**13.4**	**14.3**	**12.7**	**12.6**	**3.8**	**5.1**	**6.2**	**10.0**	**2.4**	**2.9**	**2.3**	**3.0**	**1.4**	**1.3**	**1.4**	**2.4**
China	4 001	20 978	13.8	10.7	6.7	8.0	2.9	3.8	13.0	26.3	39.1	23.4	5.1	4.4	13.0	16.3	3.9	3.9	0.1	1.1	1.7	0.5	0.6	1.7
Israel	4 916	6 487	33.6	32.9	13.6	12.7	8.8	6.9	5.8	7.6	13.7	13.6	3.4	3.4	6.2	8.3	3.5	4.0	4.7	3.5	3.1	3.3	3.7	3.9
Russian Federation[5]	31 625	15 846	14.3	3.2	17.7	7.5	2.6	4.0	27.1	27.1	27.6	35.6	4.1	8.1	4.1	8.9	0.9	3.4	0.6	1.3	0.6	0.6	0.4	0.3

1. Other: Health sciences and professional fields.

2. Czechoslavakia instead of the Czech Republic in 1988.

3. Western Germany only in 1988.

4. Average for countries available.

5. Former USSR instead of Russian Federation in 1988.

Source: US National Science Foundation, *Science and Engineering Indicators* 2004.

StatLink: http://dx.doi.org/10.1787/581733703880

Table 29. Technology balance of payments, 1981-2002

Millions current USD

	Receipts						Payments						Balance					
	1981	1985	1991	1995	2001	2002	1981	1985	1991	1995	2001	2002	1981	1985	1991	1995	2001	2002
Australia[1,2,3]	14	68	200	128	-	-	142	188	370	344	-	-	- 129	- 120	- 170	- 215	-	-
Austria[4]	24 [k]	30 [k]	79 [k]	1 907	2 430 [-]	-	99 [k]	114 [k]	301 [k]	2 140	2 426 [-]	-	- 75	- 84	- 222	- 233	4	-
Belgium	622 [a]	694	1 945	3 758 [a]	5 709	-	727 [a]	800	2 380	3 080 [a]	4 641	-	- 105	- 106	- 435	677	1 068	-
Canada	157	399	929	1 283	2 034	-	416	550	928	1 008	1 051	-	- 259	- 151	1	275	983	-
Czech Republic	-	-	-	-	487	451	-	-	-	-	554	781	-	-	-	-	- 67	- 330
Denmark	107	184	-	-	-	-	71	161	-	-	-	-	36	23	-	-	-	-
Finland	5	4	54	58	1 303	1 468	87 [k]	107 [k]	311 [k]	390 [k]	1 060	1 231	- 82	- 102	- 257	- 332	243	237
France	906	894	1 742	2 170	3 196	-	991	1 064	2 451	2 988	2 695	-	- 85	- 170	- 709	- 818	501	-
Germany	934	1 171	6 282	10 633	14 306	15 756 [n]	1 479	1 650	7 979	13 170	20 942	21 295 [n]	- 545	- 479	-1 697	-2 537	-6 636	-5 539
Hungary[3]	-	-	-	181	-	-	-	-	-	215	-	-	-	-	-	- 35	-	-
Italy	198	144	1 410	3 051	2 684	2 978	570	546	2 366	3 437	3 440	2 993	- 372	- 402	- 956	- 386	- 756	- 15
Japan	794	982	2 751	5 976	10 259	-	1 177	1 229	2 930	4 165	4 512	-	- 383	- 247	- 179	1 811	5 747	-
Mexico	33	14	79	118	41	48 [n]	273	163	420	487	419	664 [n]	- 241	- 149	- 341	- 369	- 378	- 616
Netherlands	387	1 196	4 876	-	-	-	593	1 503	5 933	-	-	-	- 206	- 308	-1 057	-	-	-
New Zealand	-	-	21	20	-	-	-	-	15	8	-	-	-	-	5	12	-	-
Norway	44 [k]	28 [k]	348	496	1 382	1 379	76 [k]	77 [k]	438	928	1 246	1 189	- 33	- 48	- 90	- 431	136	190
Poland	-	-	-	231	177	-	-	-	-	234	795	-	-	-	-	- 3	- 618	-
Portugal	-	-	-	139	282	385	-	-	-	537	597	693	-	-	-	- 398	- 316	- 308
Slovak Republic	-	-	-	9 [q]	30 [n,q]	-	-	-	-	27 [q]	65 [n,q]	-	-	-	-	- 17	- 34	-
Spain	181	137	641	79	-	-	567	552	2 276	1 110	-	-	- 387	- 414	-1 635	-1 031	-	-
Sweden	68	87	217 [a]	-	-	-	64	49	116 [a]	-	-	-	4	38	102	-	-	-
Switzerland	-	870	1 941	2 778	3 233	4 334	-	233	745	1 262	3 251	4 250	-	637	1 196	1 516	- 18	84
United Kingdom	965	1 038	2 333	4 218	17 105 [n]	-	798	923	2 302	3 530	7 713 [n]	-	167	115	32	688	9 392	-
United States	7 284	6 678	17 819	30 289	41 098	44 142 [n]	650	1 170	4 035	6 919	16 713	19 258 [n]	6 634	5 508	13 784	23 370	24 385	24 884
Russian Federation	-	-	-	-	242	211	-	-	-	-	398	577	-	-	-	-	- 157	- 366

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1986 instead of 1985. 2. 1992 instead of 1991. 3. 1996 instead of 1995. 4. 2000 instead of 2001.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/525456707887

Table 30. Technology balance of payments, 1981-2002

Payments as a percentage of GERD

	1981	1985	1991	1995	2001	2002
Australia[1, 2, 3]	7.8	8.3	7.8	5.0	-	-
Austria[4]	12.8 [k]	13.7 [k]	12.1 [b,k]	58.5 [b]	68.5 [b]	-
Belgium[5]	53.2 [a]	59.5	72.5 [b]	64.9 [a]	94.0	-
Canada	11.3	10.9	9.9	10.1	7.4	-
Czech Republic	-	-	-	-	74.4	86.6
Denmark	11.4	22.2	-	-	-	-
Finland	14.4 [a,k]	12.6 [b,k]	12.4 [a,k]	13.2 [k]	25.6	27.1
France	8.6 [a]	9.0	8.5	8.3	9.2	-
Germany	8.8	9.7	17.9 [a]	23.9 [b]	45.0	42.5 [n]
Hungary[3]	-	-	-	73.3 [c]	-	-
Italy	16.0 [r]	11.4 [r]	16.6 [a]	31.3	28.3	-
Japan	4.3 [k]	3.3 [k]	2.9 [k]	2.7 [k]	3.5	-
Mexico	-	-	-	55.0	17.1	-
Netherlands	22.3	57.1	99.8	-	-	-
New Zealand	-	-	3.7	1.4	-	-
Norway	10.4 [k]	8.1 [k]	22.5	36.9 [a]	45.8	37.3
Poland	-	-	-	26.7 [a]	67.0	-
Portugal	-	-	-	88.1	64.3	61.2
Slovak Republic	-	-	-	14.8 [c,q]	48.5 [j,n,q]	-
Spain	71.9	60.4	49.3	23.4	-	-
Sweden	2.4 [a,j]	1.7 [j]	1.7 [a,j]	-	-	-
Switzerland[1, 2, 3, 4]	-	8.6 [a]	13.9	17.7	30.4 [-]	-
Turkey	-	-	-	-	-	-
United Kingdom	6.6 [a]	9.0 [a]	10.8	15.9	29.0 [n]	-
United States	0.9 [h]	1.0 [h]	2.5 [h]	3.8 [h]	6.1 [h]	7.0 [h,n]
Russian Federation	-	-	-	-	11.1	13.4

Times series notes:

(a) to (r): See standard statistical notes for science and technology indicators earlier in the Annex.

Year availability:

1. 1986 instead of 1985.
2. 1992 instead of 1991.
3. 1996 instead of 1995.
4. 2000 instead of 2001.
5. 1983 instead of 1981.

Source: OECD, MSTI database, May 2004.

StatLink: http://dx.doi.org/10.1787/507503146810

Table 31. Share of value added in total gross value added, 1991-2001

	(ISIC Rev.3)	Australia		Austria		Belgium		Canada		Czech Republic		Denmark		Finland		France		Germany		Greece		Iceland		Ireland	
		1991	2000	1991	2001	1992	2001	1991	2000	1992	2001	1991	1999	1991	2001	1991	2000	1991	2001	1991	2001	1991	2001	1991	1999
Total manufacturing	**(15-37)**	**13.5**	**12.0**	**21.6**	**20.6**	**20.1**	**18.7**	**15.8**	**19.9**	**29.1**	**27.5**	**17.0**	**16.3**	**19.6**	**24.5**	**19.9**	**18.1**	**27.4**	**22.4**	**14.8**	**11.9**	**15.9**	**-**	**26.6**	**33.7**
Food prod., beverages and tobacco	(15-16)	2.4	2.6 [1]	2.9	2.3	2.7	2.5	2.6	2.1	4.7	3.8 [1]	3.2	2.7	2.7	1.6	2.9	2.4	2.3	2.0	2.8	2.6	7.9	-	6.9	5.4
Textiles, textile prod., leather and footwear	(17-19)	0.8	0.6 [1]	1.4	0.8	1.4	1.0	0.8	0.8	3.6	1.6 [1]	0.8	0.5	0.8	0.4	1.3	0.8	1.0	0.5	4.1	1.9	0.6	-	1.2	0.5
Wood, pulp, paper, paper prod., printing & publishing	(20-22)	2.1	2.1 [1]	2.8	3.0	1.8	1.8	2.8	4.2	2.0	2.6 [1]	2.3	2.2	5.1	6.5	2.1	1.8	2.5	2.1	1.4	1.2	1.9	0.0	3.4	6.0
Chemical, rubber, plastics and fuel prod.	(23-25)	2.1	1.8 [1]	2.4	2.7	4.5	4.9	2.6	2.5	3.0	2.8 [1]	2.2	2.7	2.5	2.6	3.3	3.6	4.1	3.7	1.7	2.0	1.1	-	5.3	11.3
....Coke, refined petroleum prod. and nuclear fuel	(23)	0.4	0.2 [1]	0.3	0.8	0.5	0.6	0.4	0.3	0.5	0.2 [1]	0.0	0.0	0.6	0.4	0.6	0.8	0.2	0.4	0.5	0.9	-	-	0.0	0.0
....Chemicals and chemical prod.	(24)	1.1	1.0 [1]	1.3	1.1	3.3	3.6	1.5	1.4	1.6	1.4 [1]	1.4	1.8	1.3	1.4	1.8	2.0	2.7	2.2	0.8	0.7	0.6	-	4.5	10.7
........Chemicals excluding pharmaceuticals	(24ex2423)	-	-	0.9	0.8	2.6	-	1.2	1.1	-	1.2 [1]	0.7	0.7	1.0	1.1	1.3	1.3	2.2	1.7	0.6	-	-	-	3.7	8.4
........Pharmaceuticals	(2423)	-	-	0.5	0.4	0.7	-	0.4	0.3	-	0.2 [1]	0.7	1.1	0.3	0.3	0.5	0.7	0.5	0.5	0.2	-	-	-	0.8	2.3
....Rubber and plastics prod.	(25)	0.6	0.6 [1]	0.8	0.8	0.8	0.7	0.6	0.9	0.8	1.1 [1]	0.8	0.8	0.6	0.8	0.9	0.8	1.3	1.1	0.4	0.3	0.5	-	0.8	0.6
Other non-metallic mineral prod.	(26)	0.7	0.7 [1]	1.5	1.2	1.1	1.0	0.4	0.5	1.8	1.9 [1]	0.7	0.8	0.9	0.8	1.0	0.8	1.0	0.8	0.9	0.9	0.9	-	1.1	0.8
Basic metals and fabricated metal prod.	(27-28)	2.6	1.9 [1]	3.2	3.3	3.1	2.5	1.8	2.6	4.4	4.4 [1]	1.8	1.7	2.1	2.7	2.7	2.4	3.6	2.9	1.4	1.1	1.4	-	1.2	0.8
Machinery and equipment	(29-33)	1.4	1.3 [1]	5.1	4.9	2.9	2.7	2.1	2.9	5.4	5.7 [1]	4.1	4.1	4.0	8.5	3.9	3.5	8.4	6.3	0.9	0.9	0.8	-	5.9	7.8
....Machinery and equip., n.e.c.	(29)	0.7	0.6 [1]	2.5	2.3	1.3	1.2	0.9	1.3	3.6	2.7 [1]	2.5	2.3	2.4	2.8	1.6	1.3	4.0	3.4	0.3	0.4	-	-	1.1	0.8
....Electrical and optical equipment	(30-33)	0.7	0.7 [1]	2.6	2.5	1.6	1.5	1.2	1.6	1.9	3.0 [1]	1.6	1.8	1.6	5.7	2.3	2.2	4.4	3.0	0.5	0.5	-	-	4.8	7.0
........Office, accounting and computing machinery	(30)	-	-	0.0	0.1	-	-	0.1	0.1	0.0	0.1 [1]	0.1	0.1	0.1	0.0	0.3	0.2	0.6	0.2	0.0	0.0	-	-	2.3	3.0
........Electrical machinery and apparatus, nec	(31)	-	-	0.9	1.0	-	-	0.4	0.4	1.4	1.7 [1]	0.6	0.6	0.7	0.8	0.8	0.8	2.2	1.5	0.1	0.2	-	-	0.8	0.7
........Radio, television and communication equipment	(32)	-	-	1.2	1.1	-	-	0.7	1.1	0.2	0.6 [1]	0.4	0.5	0.5	4.3	0.5	0.6	0.7	0.4	0.3	0.2	-	-	0.6	2.1
........Medical, precision and optical instruments	(33)	-	-	0.4	0.4	-	-	-	-	0.2	0.6 [1]	0.5	0.6	0.3	0.6	0.7	0.6	0.9	0.9	0.1	0.0	-	-	1.1	1.2
Transport equipment	(34-35)	1.1	1.1 [1]	1.0	1.3	1.9	1.7	2.0	3.4	2.7	2.9 [1]	0.7	0.5	0.9	0.9	1.9	2.1	3.6	3.6	0.7	0.6	0.8	-	0.7	0.5
....Motor vehicles, trailers and semi-trailers	(34)	0.7	0.7 [1]	0.8	1.1	-	-	1.4	2.5	2.4	2.4 [1]	0.3	0.2	0.3	0.3	1.4	1.5	3.1	3.1	0.1	0.1	-	-	0.3	0.2
....Other transport equipment	(35)	0.3	0.4 [1]	0.2	0.2	-	-	0.6	0.9	0.3	0.5 [1]	0.4	0.2	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.5	-	-	0.4	0.3
........Building and repairing of ships and boats	(351)	-	-	0.0	0.0	-	-	0.1	0.1	-	0.0 [1]	0.4	0.2	0.4	0.4	0.1	0.1	0.1	0.1	-	-	-	-	0.1	0.0
........Aircraft and spacecraft	(353)	-	-	-	-	-	-	0.4	0.6	-	0.2 [1]	-	-	0.1	0.1	0.3	0.5	0.3	0.3	-	-	-	-	0.0	0.0
........Railroad equip. and transport equip. n.e.c.	(352+359)	-	-	0.2	0.2	-	-	0.1	0.2	-	0.3 [1]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	0.3	0.3
Manufacturing nec; recycling	(36-37)	0.5	0.4	1.2	1.1	0.7	0.6	0.6	0.9	1.3	1.3 [1]	1.2	1.0	0.7	0.6	0.9	0.7	0.8	0.6	1.0	0.8	0.7	-	1.0	0.7
Electricity, gas and water supply	(40-41)	3.6	2.5	2.8	2.2	2.9	2.6	3.3	2.8	6.3	4.0	2.3	2.2	2.3	1.8	2.4	2.0	2.3	1.9	2.6	1.8	3.5	-	2.4	1.3
Construction	(45)	6.1	5.7	7.3	7.4	5.5	4.9	6.3	5.0	6.9	7.1	4.8	5.3	7.5	5.7	6.0	4.6	5.9	4.8	7.5	8.3	8.8	-	5.4	6.6
Total services	**(50-99)**	**68.2**	**70.6**	**64.6**	**67.1**	**69.3**	**72.3**	**68.3**	**64.1**	**49.1**	**55.8**	**71.0**	**72.1**	**64.8**	**64.2**	**68.4**	**72.5**	**62.2**	**69.4**	**62.8**	**70.4**	**60.0**	**-**	**56.3**	**53.9**
Wholesale and retail trade; restaurants and hotels	**(50-55)**	13.6	13.3	17.7	16.6	14.9	13.4	14.0	13.3	14.2	17.0	14.6	14.5	12.3	11.4	13.7	12.8	11.9	12.0	18.5	20.7	14.8	-	14.7	12.2
Transport and storage and communication	**(60-64)**	9.0	8.4	7.8	7.1	6.9	6.9	7.3	6.8	6.1	8.2	7.5	7.6	9.4	10.5	6.4	6.3	5.8	6.2	6.6	8.4	7.2	-	5.9	5.5
Transport and storage	(60-63)	5.9	5.3	5.4	4.8	-	-	4.2	4.1	4.7	-	5.5	5.3	7.1	7.1	4.1	4.2	3.5	3.8	-	5.2	5.7	-	3.4	-
Post and telecommunications	(64)	3.0	3.2	2.5	2.2	-	-	3.1	2.7	1.5	-	2.1	2.3	2.3	3.4	2.3	2.1	2.4	2.4	-	3.2	1.5	-	2.5	-
Finance, insurance, real estate and business services	**(65-74)**	25.9	29.3	18.4	23.5	24.6	28.0	23.9	24.7	17.2	15.7	22.8	23.2	18.0	21.0	27.1	30.4	24.2	29.8	19.5	21.2	17.2	-	15.8	20.0
Financial intermediation	(65-67)	6.5	7.4	6.8	6.6	6.2	5.3	6.3	7.1	6.6	3.6	4.8	5.0	4.3	3.8	5.0	5.1	5.0	3.8	-	5.7	5.3	-	3.3	4.5
Real estate, renting and business activities	(70-74)	19.4	21.9	11.6	16.8	18.4	22.7	17.6	17.6	10.5	12.1	18.0	18.2	13.7	17.2	22.1	25.3	19.2	26.0	-	15.5	11.9	-	12.5	15.5
....Real estate activities	(70)	9.9	9.8	6.6	8.3	-	-	12.2	10.8	4.6	-	11.1	10.7	9.1	10.4	11.0	11.9	9.3	12.4	-	12.2	7.9	-	-	-
....Renting of m&eq and other business activities	(71-74)	9.6	12.1	5.0	8.5	-	-	5.4	6.8	5.9	-	6.9	7.5	4.6	6.8	11.1	13.4	9.9	13.6	-	3.3	4.0	-	-	-
........Other business activities	(74)	-	-	3.6	5.6	-	-	-	-	4.3	-	5.0	5.4	2.9	4.2	7.3	9.2	7.3	9.5	-	2.7	-	-	-	-
Community social and personal services	**(75-99)**	19.7	19.6	20.7	20.0	23.0	24.1	23.1	19.3	11.6	15.0	26.0	26.7	25.1	21.2	21.2	23.1	20.3	21.4	18.2	20.2	20.8	-	19.9	16.1
High technology manufactures		0.8	0.9 [1]	2.1	1.9	-	-	1.6	2.1	0.4	1.7 [1]	1.7	2.3	1.3	5.2	2.3	2.5	2.9	2.3	-	-	-	-	4.8	8.6
Medium-high technology manufactures		2.7	2.3 [1]	5.3	5.4	-	-	4.0	5.5	7.4	8.3 [1]	4.1	3.9	4.5	5.1	5.1	5.0	11.6	9.7	-	-	-	-	6.1	10.4
Medium-low technology manufactures		4.3	3.6 [1]	5.8	6.1	-	-	3.5	4.3	7.6	7.7 [1]	3.7	3.6	4.5	5.0	5.3	4.9	6.2	5.2	3.5	-	-	-	3.1	2.2
Low technology manufactures		5.7	5.6	8.3	7.2	6.6	5.9	6.8	8.0	11.7	9.2 [1]	7.6	6.5	9.3	9.2	7.1	5.7	6.6	5.2	9.3	6.4	11.0	-	12.5	12.5
High and medium-high technology manufactures		3.6	3.3 [1]	7.4	7.3	8.0	8.0	5.6	7.7	9.8	10.0 [1]	6.2	6.4	6.2	10.8	7.6	7.6	14.6	12.1	2.4	2.2	2.1	-	11.0	19.0

1. Intensity of the previous year.

2. 1998 instead of 1995.

3. EU includes the 15 EU Members before 1 May 2004 excluding Austria, Greece, Luxembourg, Portugal (for which no Anberd data are available).

4. OECD includes previous EU countries and Canada, Japan, and the United States.

Source: OECD, STAN Indicators 2004.

StatLink: http://dx.doi.org/10.1787/005860125823

Table 31. Share of value added in total gross value added, 1991-2001 (cont'd)

	(ISIC Rev.3)	Italy		Japan		Korea		Netherlands		Norway		Poland		Spain		Sweden		United Kingdom		Unites States		EU[3]		OECD[4]	
		1991	2001	1991	2001	1995	2001	1991	2000	1991	1998	1994	2001	1991	2001	1991	2001	1991	2001	1991	2000	1992	1999	1991	1999
Total manufacturing	**(15-37)**	**22.5**	**20.1**	**25.8**	**20.1**	**29.2**	**30.3**	**18.2**	**16.0**	**12.1**	**13.0**	**21.7**	**17.9**	**19.9**	**17.4**	**18.9**	**20.6**	**21.0**	**16.5**	**17.4**	**15.5**	**21.8**	**20.1**	**21.0**	**18.7**
Food prod., beverages and tobacco	(15-16)	2.4	2.0	2.5	2.4	3.0	3.4	3.2	3.0	2.1	1.9	3.5	3.8 [1]	3.4	2.5	1.8	1.7	3.1	2.3	1.9	1.5	2.7	2.4	2.4	2.1
Textiles, textile prod., leather and footwear	(17-19)	3.4	2.9	1.3	0.6	2.1	1.4	0.6	0.4	0.3	0.2	2.6	1.5 [1]	1.9	1.3	0.3	0.3	1.3	0.7	0.9	0.5	1.6	1.2	1.3	0.8
Wood, pulp, paper, paper prod., printing & publishing	(20-22)	2.1	2.0	2.3	1.9	1.7	1.4	2.5	2.3	2.5	2.5	2.3	2.5 [1]	2.1	1.9	4.0	4.4	2.8	2.5	2.5	2.1	2.4	2.3	2.4	2.3
Chemical, rubber, plastics and fuel prod.	(23-25)	2.9	2.7	3.4	3.3	5.7	7.5	3.6	3.2	1.5	1.5	3.4	3.1 [1]	3.1	3.0	2.4	3.2	3.8	2.8	3.0	2.7	3.3	3.2	3.2	3.1
….Coke, refined petroleum prod. and nuclear fuel	(23)	0.5	0.2	1.0	1.3	1.8	3.4	0.5	0.4	-	-	0.7	0.6 [1]	0.6	0.5	0.3	0.2	0.5	0.3	0.5	0.4	-	0.3	-	0.5
….Chemicals and chemical prod.	(24)	1.7	1.6	2.0	1.7	2.9	2.9	2.5	2.3	-	-	1.7	1.4 [1]	1.7	1.6	1.6	2.4	2.2	1.7	1.9	1.7	2.0	2.0	2.0	1.9
……..Chemicals excluding pharmaceuticals	(24ex2423)	1.0	0.9	1.4	1.0	2.0	1.9	2.2	1.9	-	-	-	1.1 [1]	1.1	1.1	0.9	0.9	1.6	1.0	1.4	1.1	1.4	1.3	1.4	1.2
……..Pharmaceuticals	(2423)	0.6	0.7	0.6	0.7	0.9	1.0	0.3	0.4	0.2	0.2	-	0.3 [1]	0.6	0.5	0.7	1.5	0.7	0.7	0.5	0.7	0.6	0.6	0.6	0.6
….Rubber and plastics prod.	(25)	0.8	0.8	0.3	0.2	1.0	1.1	0.6	0.5	0.3	0.3	1.0	1.0 [1]	0.8	0.8	0.5	0.6	1.0	0.9	0.6	0.6	-	0.9	-	0.7
Other non-metallic mineral prod.	(26)	1.4	1.4	0.9	0.7	1.3	1.0	0.7	0.7	0.5	0.5	1.4	1.4 [1]	1.5	1.4	0.6	0.5	0.7	0.5	0.4	0.4	1.1	1.0	0.8	0.7
Basic metals and fabricated metal prod.	(27-28)	3.1	2.7	3.6	2.3	3.8	3.4	2.3	1.8	1.5	1.9	2.6	2.2 [1]	2.2	2.3	2.5	2.8	2.4	1.7	1.8	1.6	2.7	2.5	2.6	2.2
Machinery and equipment	(29-33)	4.8	4.3	7.7	5.5	7.0	6.3	3.2	2.8	1.9	2.3	3.3	3.1 [1]	2.8	2.5	4.4	4.2	4.3	3.4	4.5	4.1	5.0	4.6	5.3	4.6
….Machinery and equip., n.e.c.	(29)	2.5	2.4	3.0	1.9	1.8	1.7	1.3	1.3	1.0	1.2	1.9	1.5 [1]	1.3	1.2	2.4	2.7	1.7	1.3	1.5	1.2	2.3	2.1	2.1	1.6
….Electrical and optical equipment	(30-33)	2.3	1.9	4.8	3.6	5.2	4.6	1.9	1.5	0.9	1.1	1.4	1.6 [1]	1.6	1.2	1.9	1.5	2.5	2.1	3.0	2.8	2.6	2.5	3.2	2.9
……..Office, accounting and computing machinery	(30)	0.1	0.1	0.7	0.5	0.3	0.8	0.1	0.1	0.0	0.0	0.1	0.1 [1]	0.2	0.1	0.2	0.2	0.5	0.3	0.5	0.3	0.3	0.2	0.5	0.4
……..Electrical machinery and apparatus, nec	(31)	1.0	0.9	1.3	1.0	0.7	0.4	0.4	0.2	0.5	0.5	0.7	0.7 [1]	0.7	0.6	0.5	0.8	0.8	0.6	0.6	0.4	1.2	1.0	0.9	0.7
……..Radio, television and communication equipment	(32)	0.6	0.5	2.3	1.8	3.9	2.8	0.9	0.8	0.2	0.2	0.4	0.3 [1]	0.4	0.2	0.7	-0.1	0.6	0.6	1.1	1.4	0.6	0.7	1.1	1.3
……..Medical, precision and optical instruments	(33)	0.5	0.4	0.5	0.3	0.3	0.6	-	-	0.2	0.3	0.3	0.4 [1]	0.3	0.2	0.5	0.7	0.7	0.6	0.9	0.6	0.6	0.6	0.7	0.5
Transport equipment	(34-35)	1.3	1.3	2.4	2.3	3.9	5.5	0.8	0.8	1.5	1.8	1.6	1.3 [1]	2.0	1.8	2.3	2.9	2.1	1.8	1.8	1.9	2.1	2.2	2.1	2.2
….Motor vehicles, trailers and semi-trailers	(34)	0.8	0.7	2.2	2.0	3.1	3.4	0.3	0.4	0.1	0.2	0.7	0.7 [1]	1.6	1.5	1.6	2.3	1.1	0.9	0.8	1.2	1.6	1.6	1.4	1.6
….Other transport equipment	(35)	0.5	0.6	0.2	0.3	0.8	2.2	0.5	0.4	1.4	1.6	0.9	0.6 [1]	0.4	0.3	0.7	0.6	1.0	0.9	1.0	0.7	0.5	0.6	0.7	0.6
……..Building and repairing of ships and boats	(351)	0.1	0.2	0.1	0.1	0.7	-	-	0.2	1.2	1.6	-	0.3 [1]	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
……..Aircraft and spacecraft	(353)	0.2	0.3	0.1	0.1	0.1	-	-	0.1	0.1	0.0	-	0.1 [1]	0.1	0.1	0.4	0.3	0.8	0.6	0.9	0.5	0.3	0.3	0.5	0.4
……..Railroad equip. and transport equip. n.e.c.	(352+359)	0.1	0.2	0.1	0.1	0.1	-	-	0.1	0.1	0.0	-	0.1 [1]	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Manufacturing nec; recycling	(36-37)	1.1	1.0	1.6	1.1	0.6	0.4	1.2	1.1	0.4	0.5	1.0	1.0 [1]	0.9	0.8	0.5	0.6	0.6	0.7	0.6	0.6	0.8	0.8	0.9	0.8
Electricity, gas and water supply	(40-41)	2.2	2.3	3.1	3.7	2.1	2.8	2.0	1.5	3.4	2.6	3.8	3.7	3.3	2.1	3.3	2.7	2.7	1.8	2.9	2.2	2.5	2.2	2.8	2.5
Construction	(45)	6.2	4.9	9.3	6.9	11.2	8.3	5.8	5.8	4.1	5.1	7.3	7.2	8.7	8.7	6.6	4.4	5.9	5.5	3.9	4.7	6.3	5.4	6.0	5.4
Total services	**(50-99)**	**65.2**	**69.5**	**59.3**	**67.9**	**51.0**	**53.9**	**66.1**	**71.4**	**63.7**	**64.6**	**56.1**	**65.0**	**62.4**	**67.9**	**68.0**	**70.2**	**66.0**	**72.8**	**72.1**	**76.2**	**66.0**	**69.4**	**66.6**	**70.8**
Wholesale and retail trade; restaurants and hotels	**(50-55)**	17.0	16.6	13.6	13.2	10.2 #	12.2	15.4	15.2	12.3	11.8 [1]	20.5	21.8	18.0	19.0	12.0	12.1	14.0	15.1	17.3	18.3	14.3	14.5	15.4	15.8
Transport and storage and communication	**(60-64)**	7.1	7.4	6.5	6.2	7.0 #	6.6	7.0	7.3	11.4	9.6 [1]	7.5	7.3	7.2	8.7	8.7	8.2	8.1	7.9	6.5	6.7	6.9	7.0	6.7	6.8
Transport and storage	(60-63)	5.3	5.0	5.0	4.5	4.6 #	4.3	5.0	4.8	9.1	7.4 [1]	-	-	5.2	-	6.4	5.6	5.0	4.7	3.1	3.2	4.5	-	4.0	-
Post and telecommunications	(64)	1.8	2.3	1.5	1.7	2.4 #	2.3	2.0	2.6	2.3	2.2 [1]	-	-	2.0	-	2.3	2.6	3.1	3.1	3.4	3.5	2.4	-	2.6	-
Finance, insurance, real estate and business services	**(65-74)**	21.2	26.0	21.2	26.9	19.3 #	19.0	20.3	26.4	18.3	17.5 [1]	9.1	15.3	18.1	20.0	21.8	25.0	22.2	27.9	25.3	30.0	23.5	26.4	23.4	27.2
Financial intermediation	(65-67)	6.1	5.9	5.1	6.3	6.8 #	6.9	4.8	6.3	5.1	4.0 [1]	1.1	2.2	6.3	5.8	4.9	3.6	5.4	5.3	6.4	8.7	5.5	5.1	5.8	6.6
Real estate, renting and business activities	(70-74)	15.1	20.1	16.1	20.6	12.5 #	12.2	15.5	20.0	13.2	13.5 [1]	8.0	13.1	11.8	14.2	17.0	21.4	16.8	22.7	18.9	21.3	18.0	21.3	17.6	20.5
….Real estate activities	(70)	-	10.8	10.3	12.8	8.5 #	8.5	7.3	8.0	8.7	7.7 [1]	-	-	7.4	-	11.0	10.7	-	9.5	11.5	11.4	-	-	-	-
….Renting of m&eq and other business activities	(71-74)	-	9.4	5.8	7.7	4.0 #	3.7	8.2	12.0	4.5	5.8 [1]	-	-	4.4	-	6.0	10.6	-	13.1	7.4	9.9	-	-	-	-
……..Other business activities	(74)	-	7.5	-	-	- #	-	6.2	8.7	3.3	4.1 [1]	-	-	-	-	-	7.4	-	9.1	-	-	-	-	-	-
Community social and personal services	**(75-99)**	19.8	19.5	18.0	21.6	15.3 #	16.1	23.4	22.5	21.7	21.5 [1]	19.0	20.6	19.1	20.2	25.5	24.9	21.7	21.8	23.0	21.3	21.3	21.6	21.1	21.1
High technology manufactures		2.1	2.0	4.2	3.4	5.4	-	2.1	1.8	0.8	0.9	-	1.4 [1]	1.6	1.2	2.5	2.5	3.2	2.8	3.8	3.6	2.3	2.4	3.3	3.2
Medium-high technology manufactures		5.6	5.1	7.9	6.0	7.7	-	4.3	3.9	-	-	-	4.1 [1]	4.8	4.5	5.7	6.9	5.3	3.9	4.3	4.0	6.6	6.2	5.9	5.3
Medium-low technology manufactures		5.9	5.3	6.0	4.7	8.6	-	4.2	3.6	-	-	-	5.6 [1]	5.3	5.2	4.0	4.2	4.7	3.5	3.4	3.1	5.2	4.8	4.7	4.2
Low technology manufactures		8.9	7.8	7.7	6.0	7.5	6.6	7.6	6.7	5.2	5.1	9.4	8.8 [1]	8.3	6.5	6.6	7.0	7.8	6.2	5.9	4.8	7.6	6.7	7.0	6.0
High and medium-high technology manufactures		7.8	7.2	12.2	9.5	13.8	14.8	6.6	5.9	-	-	6.6	5.8 [1]	6.5	5.9	8.3	9.5	8.6	6.9	8.2	7.7	9.1	8.7	9.4	8.7

1. Intensity of the previous year.

2. 1998 instead of 1995.

3. EU includes the 15 EU Members before 1 May 2004 excluding Austria, Greece, Luxembourg, Portugal (for which no Anberd data are available).

4. OECD includes previous EU countries and Canada, Japan, and the United States.

Source: OECD, STAN Indicators 2004.

Table 32. Trade-to-GDP ratio for goods and services, 1991-2003[1]

Average imports and exports, as a percentage of nominal GDP, and average annual growth rates (%)

	Goods							Services							Goods and services						
	Trade-to-GDP ratio				Average growth			Trade-to-GDP ratio				Average growth			Trade-to-GDP ratio				Average growth		
	1991	1995	2001	2003	1991-2003	1991-2001	2001-03	1991	1995	2001	2003	1991-2003	1991-2001	2001-03	1991	1995	2001	2003	1991-2003	1991-2001	2001-03
Australia[2]	13.1	15.3	17.0	16.6	2.1	2.6	-2.4	4.0	4.6	4.5	4.3	0.8	1.3	-4.5	17.1	19.9	21.6	20.9	1.8	2.3	-2.9
Austria	26.7	25.8	35.4	34.7	2.2	2.8	-1.0	12.1	11.4	17.0	16.3	2.5	3.4	-1.9	38.8	37.2	52.4	51.0	2.3	3.0	-1.3
Belgium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68.2	66.9	84.2	80.9	1.4	2.1	-2.0
Canada	21.4	31.0	35.3	30.9	3.1	5.0	-6.7	4.3	5.1	5.9	5.5	2.0	3.1	-3.9	25.7	36.1	41.2	36.4	2.9	4.7	-6.3
Czech Republic	41.3	44.0	61.0	58.4	2.9	3.9	-2.3	8.0	12.0	11.1	8.8	0.8	3.3	-11.3	49.3	56.0	72.1	67.2	2.6	3.8	-3.5
Denmark	26.6	26.4	29.4	28.3	0.5	1.0	-1.8	7.7	7.0	12.1	11.7	3.5	4.5	-1.5	34.3	33.4	41.4	40.0	1.3	1.9	-1.7
Finland	17.7	26.4	30.2	28.7	4.0	5.4	-2.6	4.7	6.4	5.5	5.3	0.9	1.6	-2.4	22.4	32.8	35.7	34.0	3.5	4.7	-2.6
France	18.0	18.1	22.5	20.8	1.2	2.2	-4.0	3.7	3.7	4.6	4.4	1.5	2.3	-2.5	21.7	21.8	27.1	25.2	1.2	2.2	-3.7
Germany	22.3	20.0	28.3	28.0	1.9	2.4	-0.5	4.1	4.1	5.9	5.9	3.0	3.6	0.1	26.4	24.2	34.2	34.0	2.1	2.6	-0.4
Greece	17.8	16.5	17.9	16.7	-0.5	0.1	-3.5	4.3	4.7	10.1	7.7	4.8	8.5	-13.9	22.1	21.3	28.0	24.4	0.8	2.4	-7.0
Hungary	-	34.5	62.1	54.3	5.7	9.8	-6.7	-	10.1	11.4	9.7	-0.5	2.0	-7.9	41.8	44.6	73.5	64.1	3.6	5.6	-6.9
Iceland	23.6	24.8	26.8	23.5	0.0	1.3	-6.6	8.9	9.7	14.2	13.5	3.5	4.7	-2.7	32.5	34.5	41.0	37.0	1.1	2.3	-5.2
Ireland	45.0	57.9	63.4	47.2	0.4	3.4	-14.7	10.4	12.9	27.6	28.7	8.4	9.7	2.1	55.4	70.8	90.9	75.9	2.6	5.0	-9.0
Italy	14.7	19.4	21.6	19.5	2.3	3.9	-5.2	3.9	5.6	6.1	5.7	3.2	4.5	-3.4	18.6	25.0	27.7	25.1	2.5	4.0	-4.8
Japan[3]	7.5	6.9	8.4	8.8	1.4	1.1	4.6	1.7	1.5	1.7	1.8	0.6	0.2	5.5	9.2	8.4	10.1	11.0	1.5	1.0	4.4
Korea	23.7	24.5	29.9	30.7	2.2	2.3	1.3	3.7	4.9	6.7	6.2	4.3	6.0	-4.4	27.4	29.4	36.7	36.9	2.5	2.9	0.3
Luxembourg	62.4	53.3	53.5	46.8	-2.4	-1.5	-6.7	40.3	49.6	90.9	81.3	5.8	8.1	-5.6	102.7	103.0	144.4	128.1	1.8	3.4	-6.0
Mexico[2]	14.7	25.7	26.3	25.5	5.0	5.8	-3.1	3.1	3.4	2.4	2.3	-2.7	-2.7	-3.4	17.8	29.1	28.6	27.8	4.0	4.7	-3.2
Netherlands	43.5	44.9	51.1	48.4	0.7	1.6	-3.7	9.2	9.5	11.5	11.8	1.9	2.2	0.4	52.7	54.5	62.6	59.0	0.9	1.7	-2.9
New Zealand[2]	20.8	21.3	25.4	23.4	1.1	2.0	-8.3	7.2	7.6	8.4	8.2	1.2	1.5	-2.2	27.9	28.9	33.7	31.5	1.1	1.9	-6.7
Norway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36.0	34.9	37.2	34.5	-0.3	0.3	-3.7
Poland[3]	19.8	19.5	24.5	26.3	2.6	2.1	7.1	3.1	3.1	5.0	5.0	4.3	4.8	-0.5	22.9	22.6	29.5	35.7	3.7	2.5	9.5
Portugal[3]	-	27.4	29.6	28.0	0.3	1.3	-5.7	-	5.9	6.1	5.9	0.1	0.6	-2.5	33.6	33.3	35.7	33.4	0.0	0.6	-3.2
Slovak Republic	-	45.4	66.2	68.6	4.3	4.9	1.8	-	11.6	11.3	10.2	-3.3	-2.8	-5.2	46.1	57.0	77.5	78.8	4.5	5.2	0.9
Spain	13.8	17.5	23.1	21.7	3.8	5.2	-3.0	4.2	5.2	7.7	7.1	4.4	6.0	-3.8	18.0	22.7	30.7	28.8	4.0	5.4	-3.2
Sweden	20.8	29.1	32.1	30.5	3.2	4.3	-2.6	5.8	6.8	10.6	9.9	4.5	6.0	-3.3	26.6	35.9	42.7	40.4	3.5	4.7	-2.8
Switzerland[2]	27.1	26.0	33.7	31.4	1.2	2.2	-4.0	6.5	6.8	9.3	9.3	3.1	3.5	1.1	33.6	32.9	43.0	40.6	1.6	2.5	-2.9
Turkey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.2	22.1	32.5	29.0	5.4	7.6	-5.7
United Kingdom	18.6	22.2	21.2	19.2	0.3	1.3	-4.9	5.1	6.4	7.6	7.4	3.1	3.9	-1.1	23.7	28.5	28.7	26.6	1.0	1.9	-3.9
United States[2]	7.8	9.1	9.5	9.1	1.4	2.0	-4.3	2.5	2.6	2.7	2.6	0.5	0.7	-1.0	10.3	11.7	12.1	11.7	1.2	1.7	-3.6
Total OECD[2, 4]	**13.4**	**14.7**	**16.8**	**16.5**	**1.9**	**2.3**	**-1.7**	**3.3**	**3.6**	**4.3**	**4.4**	**2.5**	**2.6**	**1.4**	**18.0**	**19.4**	**22.3**	**22.1**	**1.9**	**2.1**	**-0.9**
EU-15[2, 4]	**19.4**	**21.3**	**25.7**	**24.7**	**1.6**	**2.7**	**-3.9**	**4.6**	**5.3**	**7.3**	**7.3**	**4.1**	**4.6**	**-0.4**	**26.3**	**28.8**	**35.5**	**34.3**	**1.9**	**2.8**	**-2.7**
EU-25[2, 4]	**19.4**	**21.6**	**26.3**	**25.3**	**1.8**	**3.1**	**-4.7**	**4.6**	**5.3**	**7.3**	**7.3**	**4.2**	**4.6**	**-0.6**	**26.4**	**29.0**	**35.9**	**34.9**	**2.2**	**3.1**	**-2.4**

1. Or nearest years available. 2. 2002 instead of 2003. 3. 2002 instead of 2003 for Goods and for Services. 4. Aggregates of countries for which data are available.

Source: OECD, National Accounts database, November 2004.

StatLink: http://dx.doi.org/10.1787/534761537201

Table 33. Export ratio by industry and technology level, 1992-2002

Exports as a percentage of production

	(ISIC Rev.3)	Australia		Austria		Belgium		Canada		Czech Rep.		Denmark		Finland		France		Germany		Greece	
		1992	1999	1992	2002	1992	2002	1992	2000	1993	2001	1992	2002	1992	2002	1992	2002	1992	2001	1995	2002
Total manufacturing	**(15-37)**	**17**	**21**	**45**	**67**	**46**	**115**	**42**	**53**	**33**	**53**	**57**	**70**	**38**	**48**	**29**	**38**	**32**	**47**	**20**	**22**
High technology manufactures		**31**	**41**	**56**	**107** [1]	**-**	**155** [2]	**57**	**84**	**76**	**68** [1]	**101**	**130**	**59**	**-**	**42**	**62** [1]	**54**	**101**	**26**	**-**
Pharmaceuticals	(2423)	16	26	58	111 [1]	59	135 [2]	10	25	-	67 [1]	85	101	36	-	24	53 [1]	46	90	11	-
Office, accounting and computing machinery	(30)	99	116	1,044	208	-	2,804 [2]	117	120	180	114 [1]	206	406	69	310	62	102 [1]	46	117	156	895
Radio, television and communication equip.	(32)	16	25	32	90	-	110 [2]	40	69	72	73 [1]	95	185	62	58	39	66 [1]	51	108	20	38
Medical, precision and optical instruments	(33)	42	67	71	102	-	232 [2]	-	-	29	42 [1]	102	96	71	62	29	45 [1]	47	74	50	68
Aircraft and spacecraft	(353)	42	40	-	- [1]	-	78 [2]	74	87	-	38 [1]	-	-	9	-	68	66 [1]	100	142	-	-
Medium-high technology manufactures		**14**	**20**	**73**	**92** [1]	**-**	**129** [2]	**62**	**72**	**63**	**69** [1]	**75**	**86**	**50**	**-**	**41**	**51** [1]	**42**	**54**	**24**	**-**
Chemicals excluding pharmaceuticals	(24ex2423)	13	18	54	79 [1]	56	118 [2]	38	53	-	59 [1]	63	90	38	-	47	61 [1]	46	60	21	-
Machinery and equipment, nec	(29)	19	26	71	81	-	160 [2]	47	67	43	80 [1]	76	77	46	48	39	55 [1]	43	57	23	38
Electrical machinery and apparatus, nec	(31)	14	25	81	90	-	97 [2]	41	66	31	71 [1]	58	77	49	77	37	53 [1]	24	38	29	42
Motor vehicles, trailers and semi-trailers	(34)	11	17	96	123	-	141 [2]	81	81	56	66 [1]	113	156	137	165	40	44	48	55	36	33
Railroad equip. and transport equip. nec	(352+359)	5	5	32	68 [1]	-	89 [2]	32	34	-	60 [1]	118	165	9	-	39	36 [1]	42	38	-	-
Medium-low technology manufactures		**21**	**23**	**40**	**44** [1]	**-**	**66** [2]	**33**	**35**	**31**	**46** [1]	**43**	**41**	**34**	**41**	**21**	**24** [1]	**22**	**31**	**23**	**-**
Coke, refined petroleum prod. and nuclear fuel	(23)	17	26	6	13	34	55	21	25	12	23 [1]	42	28	30	38	14	15	15	21	22	18
Rubber and plastics prod.	(25)	5	7	68	66	46	102	27	40	31	58 [1]	54	58	34	38	26	31 [1]	26	39	18	31
Other non-metallic mineral prod.	(26)	3	4	26	28	30	52	18	28	48	50 [1]	32	28	18	26	16	19	15	23	22	11
Basic metals	(27)	47	46	56	65	47	90 [2]	60	53	32	44 [1]	54	67	47	58	42	45 [1]	36	47	37	35
Fabricated metal prod., except mach. & equip.	(28)	5	4	37	40	21	42 [2]	15	24	34	48 [1]	35	34	22	19	12	14 [1]	15	22	12	16
Building and repairing of ships and boats	(351)	19	49	58	394 [1]	-	38 [2]	15	51	-	90 [1]	54	60	44	75	24	49 [1]	46	66	-	-
Low technology manufactures		**14**	**16**	**29**	**48**	**39**	**83**	**29**	**38**	**24**	**34** [1]	**48**	**59**	**32**	**41**	**20**	**26** [1]	**20**	**27**	**18**	**18**
Food prod., beverages and tobacco	(15-16)	19	22	8	27	30	56	14	21	14	13 [1]	51	59	5	10	20	23	13	18	15	13
Textiles, textile prod., leather and footwear	(17-19)	20	26	64	95	58	153	13	35	42	71 [1]	82	193	38	54	31	52	49	77	32	38
Wood and prod. of wood and cork	(20)	8	10	35	47	30	65	60	58	27	38 [1]	42	43	48	45	12	18 [1]	9	18	6	5
Pulp, paper, paper prod., printing & publishing	(21-22)	3	4	41	50	24	49	45	44	21	37 [1]	18	22	51	54	13	17 [1]	16	23	7	6
Manufacturing nec; recycling	(36-37)	9	12	32	60	70	186	25	51	37	53 [1]	61	59	23	26	19	26 [1]	25	37	6	8

1. Intensity of the previous year.

2. 2000 instead of 2002.

3. EU includes the 15 EU Members before 1 May 2004 excluding Belgium, Greece, Luxembourg, Netherlands.

4. OECD includes previous EU countries and Australia, Canada, Japan, Norway and the United States.

Source: OECD, STAN Indicators 2004.

StatLink: http://dx.doi.org/10.1787/442804674716

Table 33. Export ratio by industry and technology level, 1992-2002 (cont'd)

Exports as a percentage of production

	(ISIC Rev.3)	Hungary		Iceland		Ireland		Italy		Japan		Korea		Mexico		Netherlands		New Zealand		Norway	
		1992	2002	1992	2000	1992	1999	1992	2002	1992	2002	1994	2001	1992	2001	1992	2002	1992	1998	1992	2002
Total manufacturing	**(15-37)**	**39**	**63**	**50**	**54**	**70**	**84**	**23**	**34**	**13**	**18**	**23**	**31**	**19**	**42**	**64**	**82**	**36**	**40**	**37**	**40**
High technology manufactures		**-**	**94** [1]	**-**	**36** [1]	**123**	**120**	**31**	**56** [1]	**27**	**30** [1]	**39**	**-**	**-**	**84**	**93**	**223** [1]	**-**	**-**	**67**	**78** [1]
Pharmaceuticals	(2423)	-	48 [1]	-	15 [1]	248	168	15	50 [1]	4	6 [1]	4	6	8	15	61	101 [1]	-	-	64	62 [1]
Office, accounting and computing machinery	(30)	35	108 [1]	-	187 [1]	106	106	76	83 [1]	34	33 [1]	59	53	89	141	392	1,625 [1]	-	-	179	259 [1]
Radio, television and communication equip.	(32)	67	98 [1]	-	8 [1]	103	124	26	51 [1]	27	28 [1]	44	58	76	68	46	84 [1]	-	-	57	64 [1]
Medical, precision and optical instruments	(33)	24	91 [1]	-	49 [1]	95	92	32	55 [1]	43	86	33	20	-	-	-	- [1]	-	-	55	54 [1]
Aircraft and spacecraft	(353)	229	5 [1]	-	47 [1]	-	-	48	70 [1]	13	31 [1]	96	-	-	140	-	76 [1]	-	-	55	237 [1]
Medium-high technology manufactures		**-**	**77** [1]	**-**	**22** [1]	**77**	**99**	**33**	**50** [1]	**20**	**25** [1]	**24**	**-**	**34**	**69**	**82**	**95** [1]	**-**	**-**	**-**	**-**
Chemicals excluding pharmaceuticals	(24ex2423)	-	69 [1]	-	4 [1]	79	101	22	37 [1]	14	21 [1]	27	36	21	31	76	90 [1]	-	-	-	-
Machinery and equipment, nec	(29)	40	85 [1]	-	47	96	96	42	59	19	29	28	45	42	94	82	74	-	-	40	47 [1]
Electrical machinery and apparatus, nec	(31)	76	56 [1]	-	4 [1]	70	115	19	31 [1]	16	24 [1]	39	45	89	159	102	160 [1]	-	-	26	52 [1]
Motor vehicles, trailers and semi-trailers	(34)	78	94 [1]	-	42 [1]	60	87	39	53 [1]	23	26 [1]	16	31	26	55	99	122 [1]	-	-	96	82 [1]
Railroad equip. and transport equip. nec	(352+359)	36	77 [1]	-	0 [1]	2	8	35	50 [1]	74	95 [1]	8	-	-	61	-	130 [1]	-	-	11	23 [1]
Medium-low technology manufactures		**28**	**36** [1]	**-**	**54** [1]	**61**	**46**	**17**	**24** [1]	**6**	**8** [1]	**16**	**-**	**12**	**20**	**56**	**60** [1]	**-**	**-**	**-**	**-**
Coke, refined petroleum prod. and nuclear fuel	(23)	15	22 [1]	-	-	-	-	14	17	2	1	8	17	8	1	76	78	-	-	-	-
Rubber and plastics prod.	(25)	32	45 [1]	4	9	72	53	23	32	15	21 [1]	18	26	17	30	76	79	-	-	30	34 [1]
Other non-metallic mineral prod.	(26)	27	30 [1]	1	1	31	26	17	21	5	8	4	7	8	15	31	20	6	4	13	13 [1]
Basic metals	(27)	53	53 [1]	94	98 [1]	94	94	22	30 [1]	6	11	16	19	16	20	94	105	76	85	75	75
Fabricated metal prod., except mach. & equip.	(28)	26	34 [1]	9	5 [1]	54	33	12	17 [1]	4	6	17	19	14	39	32	25	10	12	26	21 [1]
Building and repairing of ships and boats	(351)	29	50 [1]	-	99 [1]	63	9	11	56 [1]	54	53 [1]	49	-	-	9	-	34 [1]	-	-	51	20
Low technology manufactures		**37**	**42** [1]	**59**	**59**	**51**	**43**	**19**	**28**	**3**	**3** [1]	**21**	**23**	**6**	**16**	**50**	**53**	**-**	**-**	**18**	**21**
Food prod., beverages and tobacco	(15-16)	25	24 [1]	72	73	50	41	9	16	1	1	4	4	2	5	52	58	51	52	16	20
Textiles, textile prod., leather and footwear	(17-19)	111	76 [1]	30	35	85	85	30	44	6	10 [1]	48	58	13	44	121	158	56	58	32	44
Wood and prod. of wood and cork	(20)	26	42 [1]	0	3	33	23	5	8	0	0 [1]	4	3	6	5	33	21	37	36	19	13
Pulp, paper, paper prod., printing & publishing	(21-22)	10	21 [1]	1	2	52	44	9	14	2	2 [1]	6	12	7	11	31	31	16	18	21	22
Manufacturing nec; recycling	(36-37)	33	151 [1]	0	1	31	34	33	44	5	7 [1]	26	43	24	53	33	28	14	12	23	28

1. Intensity of the previous year.
2. 2000 instead of 2002.
3. EU includes the 15 EU Members before 1 May 2004 excluding Belgium, Greece, Luxembourg, Netherlands.
4. OECD includes previous EU countries and Australia, Canada, Japan, Norway and the United States.

Source: OECD, STAN Indicators 2004.

Table 33. Export ratio by industry and technology level, 1992-2002 (cont'd)

Exports as a percentage of production

	(ISIC Rev.3)	Poland		Portugal		Slovak Rep.		Spain		Sweden		Switzerland		UK		Unites States		EU[3]		OECD[4]	
		1994	2001	1992	1999	1997	1999	1992	2001	1992	2001	1997	2000	1992	2001	1992	2001	1992	1999	1992	1999
Total manufacturing	**(15-37)**	**1**	**1**	**29**	**38**	**54**	**63**	**19**	**31**	**41**	**51**	**54**	**66**	**31**	**43**	**13**	**17**	**30**	**39**	**21**	**26**
High technology manufactures		**-**	**4** [1]	**42**	**62**	**-**	**-**	**28**	**49**	**66**	**67**	**-**	**-**	**57**	**100**	**26**	**35**	**49**	**71**	**34**	**43**
Pharmaceuticals	(2423)	-	4 [1]	11	23	-	-	10	32	67	79	-	-	40	76	10	15	33	56	19	28
Office, accounting and computing machinery	(30)	0	1 [1]	175	128	78	461	52	50	97	136	-	-	69	101	47	58	65	104	48	57
Radio, television and communication equip.	(32)	5	5 [1]	52	75	77	140	33	66	65	55	40	52	52	123	24	37	45	74	31	40
Medical, precision and optical instruments	(33)	1	1 [1]	61	60	34	30	24	47	65	72	76	88	51	63	16	26	44	56	30	41
Aircraft and spacecraft	(353)	-	9 [1]	-	-	-	-	121	86	46	103	-	-	70	123	35	44	73	77	47	57
Medium-high technology manufactures		**-**	**2** [1]	**39**	**66**	**-**	**-**	**36**	**51**	**50**	**58**	**-**	**-**	**45**	**53**	**20**	**24**	**42**	**51**	**-**	**-**
Chemicals excluding pharmaceuticals	(24ex2423)	-	2 [1]	20	34	-	-	22	38	43	66	-	-	46	60	17	22	41	54	-	-
Machinery and equipment, nec	(29)	3	3 [1]	36	51	58	81	34	42	52	64	70	82	51	55	24	27	45	54	32	38
Electrical machinery and apparatus, nec	(31)	3	2 [1]	57	94	64	82	25	36	49	66	44	51	36	52	24	38	29	41	24	34
Motor vehicles, trailers and semi-trailers	(34)	3	3 [1]	57	85	112	103	49	67	54	50	104	126	45	48	18	19	47	52	33	35
Railroad equip. and transport equip. nec	(352+359)	-	5 [1]	28	27	-	-	15	45	18	23	-	-	17	20	11	11	33	38	33	32
Medium-low technology manufactures		**-**	**1** [1]	**19**	**24**	**-**	**-**	**17**	**21**	**39**	**44**	**-**	**-**	**21**	**24**	**7**	**8**	**22**	**25**	**-**	**-**
Coke, refined petroleum prod. and nuclear fuel	(23)	1	1 [1]	24	18	34	45	24	20	48	49	-	-	24	29	5	5	18	20	-	-
Rubber and plastics prod.	(25)	1	1 [1]	14	33	67	75	18	29	45	56	48	53	21	22	8	11	26	32	18	21
Other non-metallic mineral prod.	(26)	0	0 [1]	18	19	47	45	11	18	17	26	21	27	16	17	6	7	16	20	11	13
Basic metals	(27)	1	1 [1]	17	47	62	54	27	29	52	61	94	174	33	44	10	13	35	39	19	22
Fabricated metal prod., except mach. & equip.	(28)	0	0 [1]	18	26	34	47	10	13	25	27	27	31	13	15	5	6	15	18	9	11
Building and repairing of ships and boats	(351)	-	2 [1]	29	10	-	-	47	26	71	57	-	-	15	15	10	9	31	39	33	34
Low technology manufactures		**0**	**0** [1]	**29**	**31**	**39**	**45**	**9**	**19**	**28**	**39**	**-**	**-**	**16**	**17**	**6**	**7**	**20**	**25**	**12**	**15**
Food prod., beverages and tobacco	(15-16)	0	0 [1]	9	12	14	13	7	16	6	15	12	13	14	15	6	6	15	19	9	11
Textiles, textile prod., leather and footwear	(17-19)	1	0 [1]	49	53	96	125	15	36	58	107	72	78	30	43	7	13	35	46	21	29
Wood and prod. of wood and cork	(20)	0	0 [1]	38	39	45	53	7	11	36	42	8	10	3	5	6	4	14	19	11	14
Pulp, paper, paper prod., printing & publishing	(21-22)	0	0 [1]	20	24	43	52	9	16	40	50	21	26	11	12	5	6	17	21	11	12
Manufacturing nec; recycling	(36-37)	0	0 [1]	19	21	45	53	10	21	34	41	88	95	26	24	12	15	26	32	14	19

1. Intensity of the previous year.

2. 2000 instead of 2002.

3. EU includes the 15 EU Members before 1 May 2004 excluding Belgium, Greece, Luxembourg, Netherlands.

4. OECD includes previous EU countries and Australia, Canada, Japan, Norway and the United States.

Source: OECD, STAN Indicators 2004.

Table 34. Import penetration by industry and technology level, 1992-2002

Imports as a percentage of domestic demand

	(ISIC Rev.3)	Australia		Austria		Belgium		Canada		Czech Republic		Denmark		Finland		France		Germany		Greece	
		1992	1999	1992	2002	1995	2002	1992	2000	1993	2001	1992	2002	1992	2002	1992	2002	1992	2001	1995	2002
Total manufacturing	**(15-37)**	**26**	**34**	**49**	**66**	**76**	**117**	**43**	**53**	**32**	**53**	**53**	**68**	**31**	**37**	**29**	**37**	**29**	**40**	**40**	**46**
High technology manufactures		**65**	**75**	**68**	**106** [1]	**129**	**152**	**72**	**88**	**92**	**81** [1]	**101**	**137**	**67**	**52** [1]	**42**	**59** [1]	**56**	**101**	**72**	**-**
Pharmaceuticals	(2423)	36	49	65	109 [1]	91	145 [2]	32	53	-	86 [1]	73	103	58	74 [1]	19	47 [1]	36	84	58	-
Office, accounting and computing machinery	(30)	100	103	152	146	253	474 [2]	107	108	106	106 [1]	126	155	78	119	72	101 [1]	62	109	102	109
Radio, television and communication equipment	(32)	50	70	42	90	119	110 [2]	56	74	83	82 [1]	95	172	63	37	45	64 [1]	57	107	71	73
Medical, precision and optical instruments	(33)	75	85	79	102	151	169 [2]	-	-	66	62 [1]	103	94	75	54	33	48 [1]	38	65	91	95
Aircraft and spacecraft	(353)	71	76	-	-	86	78 [2]	73	83	-	71 [1]	-	-	50	84 [1]	55	49 [1]	100	156	-	-
Medium-high technology manufactures		**39**	**49**	**76**	**92** [1]	**102**	**135** [2]	**66**	**73**	**66**	**67** [1]	**77**	**88**	**54**	**56** [1]	**38**	**48** [1]	**29**	**39**	**71**	**-**
Chemicals excluding pharmaceuticals	(24ex2423)	32	40	66	84 [1]	109	125 [2]	42	59	-	69 [1]	76	93	50	54 [1]	44	57 [1]	36	53	65	-
Machinery and equipment, nec	(29)	51	63	71	77	100	161 [2]	69	79	55	81 [1]	68	72	45	39	41	56 [1]	26	37	70	75
Electrical machinery and apparatus, nec	(31)	39	54	76	88	64	97 [2]	65	82	33	68 [1]	62	71	49	74	30	48 [1]	17	32	48	65
Motor vehicles, trailers and semi-trailers	(34)	37	46	97	123	111	150 [2]	79	76	42	53 [1]	106	120	128	130	35	38	34	35	92	93
Railroad equip. and transport equip. nec	(352+359)	32	44	37	60 [1]	80	94 [2]	31	38	-	45 [1]	111	111	25	50 [1]	40	43 [1]	39	42	-	-
Medium-low technology manufactures		**15**	**20**	**38**	**45** [1]	**53**	**60** [2]	**28**	**33**	**22**	**47** [1]	**45**	**46**	**28**	**27**	**22**	**25** [1]	**22**	**27**	**34**	**-**
Coke, refined petroleum prod. and nuclear fuel	(23)	16	15	23	39	39	48	11	11	18	45 [1]	47	35	31	26	22	20	28	27	16	16
Rubber and plastics prod.	(25)	24	29	64	67	81	102	36	43	38	64 [1]	52	57	40	38	27	32 [1]	22	29	41	51
Other non-metallic mineral prod.	(26)	10	12	21	27	36	42	30	37	20	30 [1]	26	30	19	20	15	19	16	20	25	17
Basic metals	(27)	18	23	53	58	76	87 [2]	39	45	19	53 [1]	78	82	31	42	42	47 [1]	37	45	46	42
Fabricated metal prod., except mach.&equip.	(28)	11	13	35	39	34	43 [2]	27	33	21	37 [1]	31	35	21	16	12	15 [1]	12	15	33	35
Building and repairing of ships and boats	(351)	3	50	71	239 [1]	36	29 [2]	16	59	-	82 [1]	25	48	25	17	14	29 [1]	16	50	-	-
Low technology manufactures		**15**	**19**	**31**	**44**	**59**	**81**	**22**	**27**	**17**	**32** [1]	**38**	**52**	**14**	**20**	**22**	**28** [1]	**27**	**31**	**26**	**29**
Food prod., beverages and tobacco	(15-16)	7	9	11	27	42	50	13	17	10	15 [1]	29	40	7	17	16	19	17	20	22	24
Textiles, textile prod., leather and footwear	(17-19)	35	48	71	96	91	180	41	54	25	69 [1]	85	169	59	73	39	61	64	85	31	41
Wood and prod. of wood and cork	(20)	13	12	20	24	55	62	17	16	10	22 [1]	50	54	8	9	16	23 [1]	20	19	27	36
Pulp, paper, paper prod., printing & publishing	(21-22)	15	16	33	36	45	51	23	23	27	41 [1]	28	31	9	10	17	21 [1]	16	21	32	25
Manufacturing nec; recycling	(36-37)	28	36	38	60	119	189	39	48	27	38 [1]	38	46	30	36	27	35 [1]	30	40	29	36

1. For comparison: intensity of the previous year.

2. 2000 instead of 2002.

3. EU includes the 15 EU Members before 1 May 2004 excluding Belgium, Greece, Luxembourg, Netherlands.

4. OECD includes previous EU countries and Australia, Canada, Japan, Norway and the United States.

Source: OECD, STAN Indicators 2004.

StatLink: http://dx.doi.org/10.1787/707487145841

Table 34. Import penetration by industry and technology level, 1992-2002 (cont'd)

Imports as a percentage of domestic demand

	(ISIC Rev.3)	Hungary		Iceland		Ireland		Italy		Korea		Mexico		Netherlands		New Zealand		Norway	
		1992	2001	1992	2000	1992	1999	1992	2001	1994	2001	1992	2001	1992	2002	1992	1998	1992	2002
Total manufacturing	**(15-37)**	**38**	**63**	**55**	**63**	**64**	**76**	**21**	**31**	**21**	**24**	**25**	**45**	**63**	**80**	**38**	**43**	**44**	**47**
High technology manufactures		**-**	**94**	**-**	**81** [1]	**147**	**140**	**40**	**63**	**33**	**-**	**-**	**84**	**93**	**211** [1]	**-**	**-**	**84**	**177** [1]
Pharmaceuticals	(2423)	-	55	-	62 [1]	-125	-139	20	49	7	11	17	23	62	101 [1]	-	-	70	84 [1]
Office, accounting and computing machinery	(30)	88	110	-	100 [1]	112	111	83	93	51	32	91	192	296	-	-	-	114	693 [1]
Radio, television and communication equipment	(32)	78	98	-	97 [1]	102	135	41	61	27	48	77	72	52	90 [1]	-	-	77	90 [1]
Medical, precision and optical instruments	(33)	47	94	-	80 [1]	91	87	43	61	63	43	-	-	-	- [1]	-	-	75	- [1]
Aircraft and spacecraft	(353)	200	32	-	66 [1]	184	152	46	74	99	-	-	205	-	82 [1]	-	-	80	79 [1]
Medium-high technology manufactures		**-**	**77**	**-**	**82** [1]	**78**	**98**	**32**	**45**	**28**	**-**	**37**	**69**	**83**	**94** [1]	**-**	**-**	**-**	**96** [1]
Chemicals excluding pharmaceuticals	(24ex2423)	-	80	-	64 [1]	69	104	36	48	33	35	32	52	70	85 [1]	-	-	-	95 [1]
Machinery and equipment, nec	(29)	54	91	-	82	98	98	23	38	48	45	72	96	85	72	-	-	64	76 [1]
Electrical machinery and apparatus, nec	(31)	69	51	-	82 [1]	77	116	16	27	32	54	87	192	102	148 [1]	-	-	50	128 [1]
Motor vehicles, trailers and semi-trailers	(34)	80	92	-	98 [1]	90	98	52	62	6	6	10	45	99	114 [1]	-	-	99	110 [1]
Railroad equip. and transport equip. nec	(352+359)	51	74	-	84 [1]	11	13	25	41	10	-	-	56	-	123 [1]	-	-	37	123 [1]
Medium-low technology manufactures		**25**	**46**	**-**	**60** [1]	**71**	**63**	**16**	**20**	**15**	**-**	**24**	**37**	**52**	**53** [1]	**-**	**-**	**-**	**53** [1]
Coke, refined petroleum prod. and nuclear fuel	(23)	11	19	-	- [1]	121	121	18	16	17	14	18	11	47	63	-	-	-	61 [1]
Rubber and plastics prod.	(25)	36	59	49	53	76	66	16	22	8	12	42	60	80	80	-	-	60	81 [1]
Other non-metallic mineral prod.	(26)	21	36	21	20	36	34	7	9	6	11	7	13	39	27	20	21	25	33 [1]
Basic metals	(27)	48	65	89	94 [1]	96	97	36	44	20	21	27	40	94	104	69	80	70	68
Fabricated metal prod., except mach.&equip.	(28)	24	45	47	41 [1]	60	50	5	7	10	10	32	54	34	26	19	18	42	29 [1]
Building and repairing of ships and boats	(351)	21	55	-	99 [1]	65	62	11	34	22	-	-	42	-	14 [1]	-	-	37	19
Low technology manufactures		**27**	**37**	**37**	**42**	**37**	**32**	**14**	**21**	**13**	**18**	**12**	**18**	**46**	**47**	**-**	**-**	**24**	**27**
Food prod., beverages and tobacco	(15-16)	9	13	24	33	23	24	15	20	9	12	7	8	34	40	11	15	10	14
Textiles, textile prod., leather and footwear	(17-19)	118	75	71	75	90	94	14	27	18	32	18	42	112	138	52	60	79	85
Wood and prod. of wood and cork	(20)	20	41	61	54	47	42	15	17	27	28	9	11	58	47	6	7	20	24
Pulp, paper, paper prod., printing & publishing	(21-22)	25	36	30	30	45	24	11	16	11	14	21	31	33	31	20	23	21	22
Manufacturing nec; recycling	(36-37)	40	346	45	56	32	41	11	18	15	29	25	39	45	39	30	34	48	52

1. For comparison: intensity of the previous year.

2. 2000 instead of 2002.

3. EU includes the 15 EU Members before 1 May 2004 excluding Belgium, Greece, Luxembourg, Netherlands.

4. OECD includes previous EU countries and Australia, Canada, Japan, Norway and the United States.

Source: OECD, STAN Indicators 2004.

Table 34. Import penetration by industry and technology level, 1992-2002 (cont'd)

Imports as a percentage of domestic demand

	(ISIC Rev.3)	Poland		Portugal		Spain		Slovak Rep.		Sweden		Switzerland		United Kingdom		United States		EU[3]		OECD[4]	
		1992	2001	1992	1999	1992	2001	1997	1999	1992	2001	1997	2000	1992	2001	1992	2001	1992	1999	1992	1999
Total manufacturing	**(15-37)**	**21**	**38**	**38**	**47**	**25**	**35**	**55**	**63**	**37**	**45**	**53**	**65**	**34**	**48**	**15**	**23**	**30**	**37**	**20**	**26**
High technology manufactures		**-**	**70** [1]	**69**	**74** [1]	**51**	**68**	**-**	**-**	**65**	**62**	**-**	**-**	**57**	**100**	**23**	**36**	**52**	**71**	**31**	**43**
Pharmaceuticals	(2423)	-	65 [1]	36	53 [1]	19	46	-	-	48	57	-	-	29	72	8	19	28	48	17	27
Office, accounting and computing machinery	(30)	88	83 [1]	104	108 [1]	76	74	97	157	98	109	139	142	75	101	51	68	74	103	50	65
Radio, television and communication equipment	(32)	50	74 [1]	66	64 [1]	58	80	89	117	58	45	57	69	59	126	32	42	53	73	29	38
Medical, precision and optical instruments	(33)	50	49 [1]	89	87 [1]	58	71	59	64	64	70	49	71	50	64	12	23	44	55	27	38
Aircraft and spacecraft	(353)	-	93 [1]	-	- [1]	114	90	-	-	50	103	-	-	60	124	14	30	69	74	36	49
Medium-high technology manufactures		**-**	**59** [1]	**66**	**73** [1]	**43**	**55**	**-**	**-**	**46**	**52**	**-**	**-**	**47**	**58**	**21**	**31**	**38**	**46**	**-**	**-**
Chemicals excluding pharmaceuticals	(24ex2423)	-	55 [1]	47	59 [1]	37	47	-	-	55	73	-	-	43	58	11	20	41	51	-	-
Machinery and equipment, nec	(29)	44	63 [1]	70	69 [1]	52	56	71	87	45	54	50	68	49	56	19	26	36	44	24	31
Electrical machinery and apparatus, nec	(31)	28	56 [1]	60	80 [1]	33	41	70	83	54	66	35	43	39	53	27	47	25	38	21	34
Motor vehicles, trailers and semi-trailers	(34)	35	61 [1]	83	87 [1]	45	66	110	105	41	40	101	103	52	62	29	36	43	48	29	34
Railroad equip. and transport equip. nec	(352+359)	-	39 [1]	65	40 [1]	36	42	-	-	23	27	-	-	31	41	17	21	36	43	28	32
Medium-low technology manufactures		**-**	**28** [1]	**29**	**34** [1]	**17**	**22**	**-**	**-**	**37**	**39**	**-**	**-**	**24**	**26**	**9**	**13**	**22**	**24**	**-**	**-**
Coke, refined petroleum prod. and nuclear fuel	(23)	11	14 [1]	30	26 [1]	23	23	18	26	50	42	109	113	18	26	9	13	24	22	-	-
Rubber and plastics prod.	(25)	24	37 [1]	35	47 [1]	22	30	64	78	50	57	52	56	25	26	9	12	25	29	18	20
Other non-metallic mineral prod.	(26)	11	19 [1]	10	13 [1]	8	10	31	33	27	30	34	40	18	19	9	14	14	15	10	13
Basic metals	(27)	16	43 [1]	63	76 [1]	27	36	39	35	42	53	95	155	43	50	14	22	39	43	20	24
Fabricated metal prod., except mach.&equip.	(28)	16	33 [1]	24	31 [1]	13	14	36	48	22	22	22	26	14	18	6	9	12	14	9	11
Building and repairing of ships and boats	(351)	-	19 [1]	17	10 [1]	18	26	-	-	69	24	-	-	13	8	2	6	17	20	12	15
Low technology manufactures		**11**	**21** [1]	**22**	**27** [1]	**14**	**21**	**36**	**44**	**23**	**30**	**-**	**-**	**25**	**30**	**11**	**16**	**22**	**26**	**15**	**19**
Food prod., beverages and tobacco	(15-16)	8	9 [1]	16	22 [1]	10	17	22	23	14	25	18	19	19	22	5	6	16	19	11	13
Textiles, textile prod., leather and footwear	(17-19)	12	59 [1]	31	36 [1]	22	39	96	128	84	103	86	90	45	67	27	44	39	50	31	42
Wood and prod. of wood and cork	(20)	4	12 [1]	11	16 [1]	14	19	20	31	9	15	17	19	29	31	8	13	19	21	14	17
Pulp, paper, paper prod., printing & publishing	(21-22)	22	26 [2]	19	23 [2]	14	17	35	43	13	16	31	37	18	18	4	6	16	18	9	10
Manufacturing nec; recycling	(36-37)	17	29 [1]	30	29 [1]	18	22	39	51	39	41	91	96	37	39	27	39	26	31	19	26

1. For comparison: intensity of the previous year.

2. 2000 instead of 2002.

3. EU includes the 15 EU Members before 1 May 2004 excluding Belgium, Greece, Luxembourg, Netherlands.

4. OECD includes previous EU countries and Australia, Canada, Japan, Norway and the United States.

Source: OECD, STAN Indicators 2004.

Table 35. Outward and inward foreign direct investment flows, 1990-2001

Billion USD

	Outward flows						Inward flows						Cumulative
	1990	1995	1998	1999	2000	2001	1990	1995	1998	1999	2000	2001	net outflow
Australia	2	2	5	2	1	6	6	5	6	7	7	6	- 39
Austria	2	1	3	3	6	3	-	-	-	3	9	6	10
Belgium-Luxembourg	6	12	28	133	218	86	8	11	23	149	226	77	- 38
Canada	5	11	34	16	48	35	8	9	23	24	67	27	10
Czech Republic	-	0	0	0	0	0	-	3	4	6	5	5	- 26
Denmark	2	3	4	13	24	9	1	4	6	11	32	7	- 4
Finland	3	1	19	7	24	8	1	1	12	5	9	3	40
France	36	16	43	127	176	83	16	24	29	47	43	53	326
Germany[1]	24	39	89	110	50	43	2	14	25	55	195	32	171
Greece	-	-	-	-	-	1	2	-	-	-	-	2	- 7
Hungary	-	-	-	0	1	0	-	-	-	2	2	2	- 5
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	-	-	4	5	5	6	0	0	9	19	26	16	- 53
Italy	7	6	12	7	12	21	6	5	3	7	13	15	40
Japan	57	53	40	65	50	33	3	4	10	21	29	18	441
Korea	1	3	3	2	3	2	1	1	5	11	10	3	- 13
Mexico	-	-	-	-	-	-	3	10	12	12	15	24	- 132
Netherlands	13	19	39	41	72	40	9	11	38	32	54	51	92
New Zealand	2	2	0	1	1	1	2	3	2	1	1	3	- 19
Norway	1	3	3	6	8	2	1	2	4	8	6	3	3
Poland	-	0	0	0	0	0	0	4	6	7	9	6	- 46
Portugal	0	1	4	3	8	8	2	1	3	1	6	6	- 3
Slovak Republic	-	-	-	-	0	0	-	-	-	-	2	1	- 4
Spain	3	4	19	42	55	28	14	6	12	16	38	22	18
Sweden	15	11	24	22	41	-	2	14	20	61	23	13	- 20
Switzerland	7	12	19	33	43	11	5	2	9	12	19	8	119
Turkey	-	-	-	1	1	0	1	1	1	1	1	3	- 11
United Kingdom	18	44	122	201	254	39	30	20	71	88	117	53	372
United States	31	92	131	175	165	114	48	59	174	283	301	124	- 201
Total OECD[2]	**236**	**335**	**645**	**1 015**	**1 263**	**580**	**171**	**214**	**506**	**888**	**1 267**	**590**	**1 020**
EU-25[2]	**129**	**157**	**410**	**715**	**944**	**375**	**93**	**118**	**259**	**508**	**811**	**370**	**862**
EU-15[2]	**129**	**157**	**410**	**715**	**943**	**375**	**93**	**111**	**249**	**493**	**793**	**355**	**943**

1. The statistics cover unified Germany as from 1990.

2. Excluding missing countries for respective years.

Source: OECD, FDI database, May 2004.

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