

2007

R&D statistics
Compiled by RANNIS in 2007



RANNÍS

2007

R&D statistics 2005

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Highlights

- In 2005, R&D expenditure in Iceland amounted to 28 billion ISK (ca. 335 MEUR). As a share of the Gross Domestic Product (GDP), R&D expenditure accounted for 2,8%.
- From 2003 to 2005 total R&D expenditure in fixed prices has increased by 4 billion ISK (ca. 48 MEUR) or by 16%. R&D expenditure, as a share of the GDP, has decreased somewhat whilst the GDP has increased by 20% since 2003.
- Of all sectors, R&D expenditure was highest (34%) in the health sector in 2005, amounting to 9,3 billion ISK (ca. 111 MEUR). In comparison, 3,1 billion ISK (ca. 37 MEUR) was spent on R&D in the fisheries and agriculture (11%). Basic research is not included in these figures.
- Iceland is ranked 5th among OECD countries for the R&D/GDP ratio. Sweden, Finland, South Korea and Switzerland are ranked ahead of Iceland.
- The private sector spent about 14 billion ISK (ca. 168 MEUR) on R&D in 2005. This constitutes about 52% of Iceland's gross expenditure on R&D (GERD).
- In 2005, approximately 48% of the total expenditure on R&D was financed by the private sector, 41% by the government and 11% of the funding came from abroad.
- In 2005, Sweden had a higher level of R&D expenditure per capita (i.e. 118 thousand ISK or ca. 1,4 thousand EUR) than Iceland (98 thousand ISK or ca. 1 thousand EUR), whilst Iceland had higher levels than Norway (63 thousand ISK or ca. 750 EUR).
- Slightly more than 3.200 FTE's were performed in Iceland in 2005, involving 5.700 individuals. Most of the FTE's (47%) were performed within the private sector.

RANNIS, - The Icelandic Centre for Research was established by a legislation enacted in 2003 and replaced the office of the earlier Icelandic Research Council established in 1994. This in turn replaced earlier councils that traced their origins to a research council structure set up before the Second World War. The Icelandic Research Council was abolished by the legislation in 2003, and the Science and Technology Policy Council was established. The Council has 14 members representing the science and technology community and the social partners plus five ministers and is chaired by the Prime Minister.

RANNIS reports to the Ministry of Education, Science and Culture and its mission is to provide professional assistance to the preparation and implementation of science and technology policy in Iceland.

The main functions of RANNIS are the following:

- RANNIS operates the competitive financial public support system for research and technological development. This includes the Research Fund, the Fund for Research Equipment and the Graduate Research Fund under the Ministry of Education, and the Technology Development Fund under the Ministry of Industry. Each of the funds is governed by a Board of Directors, the allocation of grants being subject to an extensive peer review processes.
- RANNIS actively provides the Science and Technology Policy Council and its subcommittees with information on scientific research and technology development nationally and internationally as a basis for the policy making process.

- RANNIS coordinates and promotes Icelandic participation in various international research and development activities and interacts with corresponding agencies and research councils in other countries. RANNIS is the NCP-host organization for the 7th Framework Programme.
- RANNIS monitors the resource allocation in Iceland and the R&D activities, evaluates the results of scientific research, technical development and innovation, and participates in international benchmarking of the results.
- RANNIS promotes public awareness of research and innovation in Iceland.

RANNIS serves the Icelandic science community across all fields of science and humanities.

The staff of RANNIS is a team of 20, including 15 professionals, led by a Director. RANNIS relies heavily on the involvement of external contacts in its operation. Around 70–80 working scientists and technical experts are co-opted to assist in the evaluation of grants applications and international contacts at any time on a rotating basis.

Research in Iceland

Research, development and innovation statistics

This booklet provides an abstract of research and development (R&D) statistics in Iceland and is based on the extensive database that has been collected and collated by RANNIS and its predecessors (National Research Council and the Icelandic Research Council) since 1970. Previous booklets can be downloaded from the following website: <http://www.rannis.is/>. The collection and processing of the data have been organized in accordance with the procedures in OECD's Frascati Manual. Furthermore, RANNIS actively collaborates with Eurostat and various institutions in the Nordic countries. RANNIS' survey of R&D activities in Iceland is conducted every other year. In 2005 data was gathered from 1.200 businesses chosen from the Statistics Iceland database of firms exceeding four employees as well as public institutions involved in R&D. In addition to the R&D survey, RANNIS collects data on R&D from a number of external sources, e.g. commercial companies, public institutions, including institutions of applied industrial research, higher education and private non-profit organizations.

Other analysing and statistical activities

RANNIS performs statistical work in a number of fields other than R&D. One important area is the collation and processing of data on innovation among Icelandic companies, using information compiled by Statistics Iceland and RANNIS; this forms part of a European Project, CIS (Community Innovation Survey) conducted by Eurostat in collaboration with the OECD. RANNIS also processes data in the field of education supplied by Statistic Iceland, the University of Iceland and others. Moreover, RANNIS collects data on publications and citations and on patent applications and grants. RANNIS currently intends to increase its involvement in the assessment and evaluation of research in various individual areas of science and industry. Researchers from RANNIS play an active part in collaborative Nordic and European projects in areas relating to statistics and policy-making in the sciences, technology, innovation and other aspects of the knowledge-based economy.

Research, development and innovation: What are they?

According to the Frascati Manual (2002) R&D is creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications. R&D covers three activities: basic research, applied research and experimental development.

Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

Applied research is original investigation undertaken to acquire new knowledge; it is directed primarily at a specific practical aim or objective.

Experimental development is systematic work, drawing on existing knowledge gained from research and practical experience, directed at producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

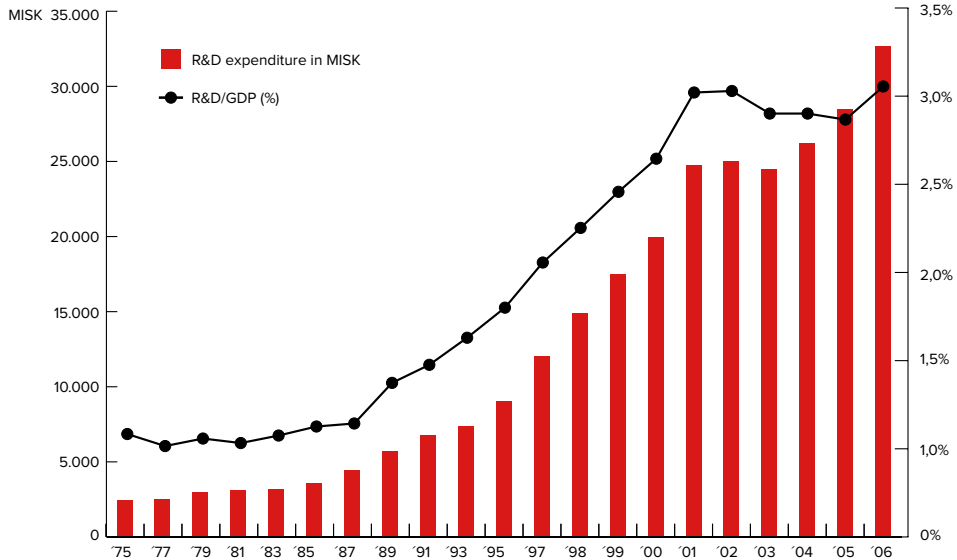
According to OECD's Oslo Manual (2005) **innovation** is the implementation of a new or significantly improved product (goods or services), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. Innovation is always at least new for the firm, but may also be new for the local environment or the world as a whole.

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Figure 1. Total R&D expenditure and R&D expenditure as percentage of the Gross Domestic Product (GDP) from 1975 to 2006.



* Statistics for the even years are estimates.

Figure 2. Expenditure on R&D by theme from 1985 to 2005 (%).

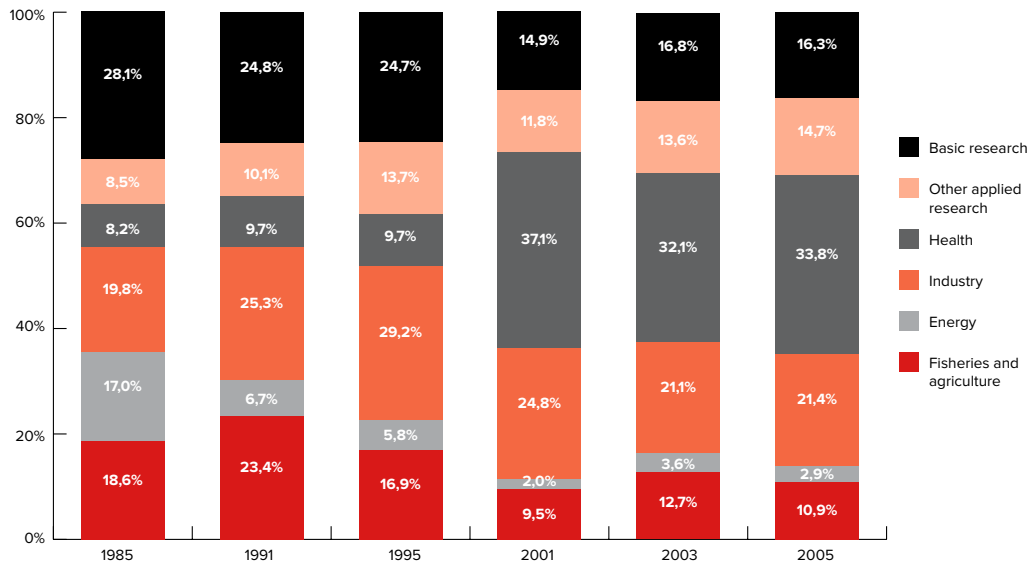


Figure 3. R&D expenditure as a share of GDP in various OECD countries in 2005. Comparison with statistics from 2003.

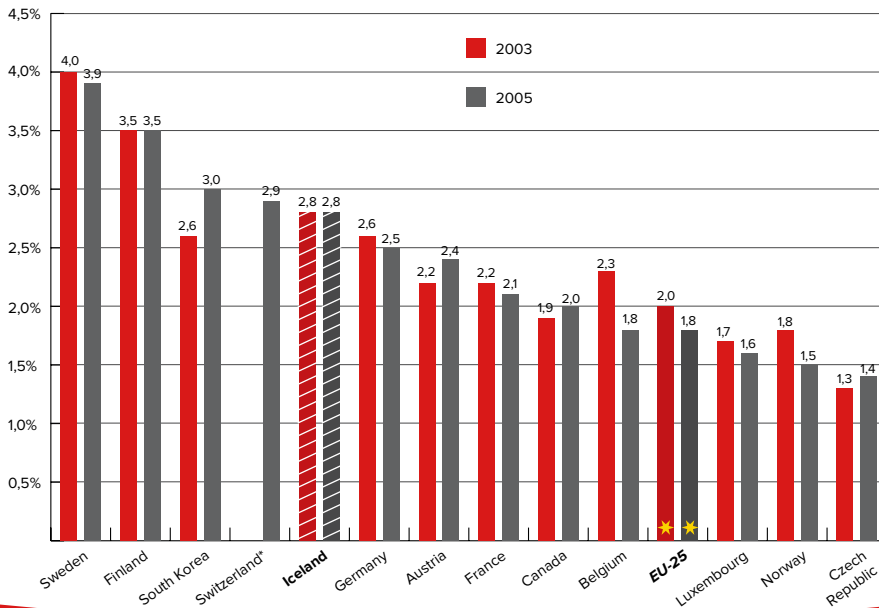


Figure 4. R&D expenditure as a share (%) of GDP in various OECD countries from 1993 to 2005.

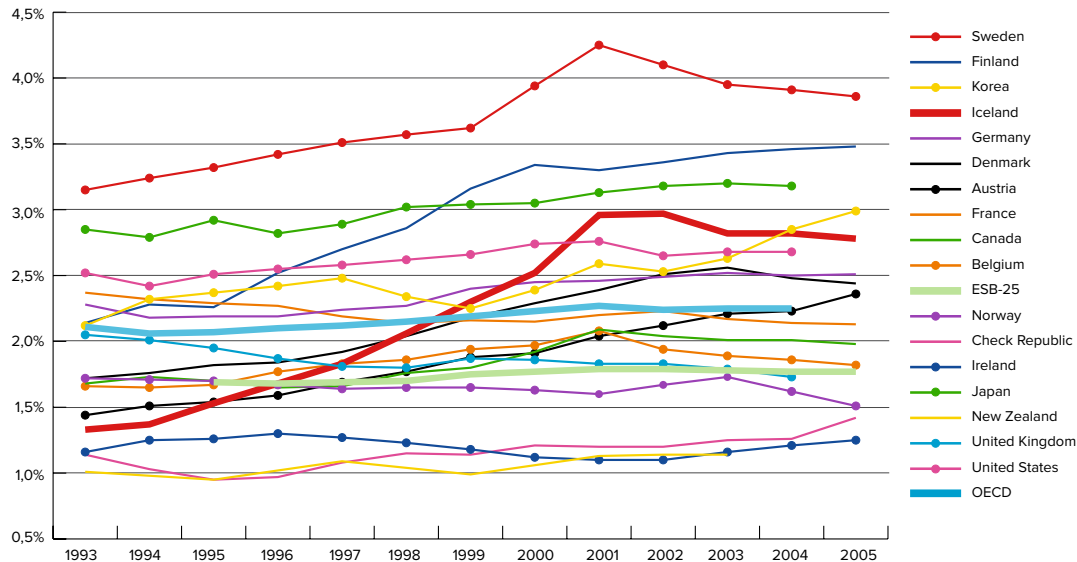


Table 1. Total R&D expenditure in 2005 by source of funding and performing organization (MISK).

Performing organizations											
		Business sector	%	Private non-profit	%	Public institutions	%	Higher education	%	Total	%
Source of funding	Business enterprise	12.442	84,9	-	-	493	7,4	706	11,3	13.641	48,0
	Private non-profit	0,5	-	80	9,4	-	-	32	0,5	112	0,4
	Public funding	416	2,8	337	39,6	5.881	87,9	4.874	78,0	11.508	40,5
	From abroad	1.794	12,3	434	51,0	318	4,7	634	10,2	3.180	11,2
	Total	14.653	100	851	100	6.692	100	6.246	100	28.441	100
Percentage of total expenditure (%)		51,5		3,0		23,5		22,0		100	

Figure 5. R&D expenditure per capita and R&D expenditure as a share of GDP in various OECD countries in 2005.

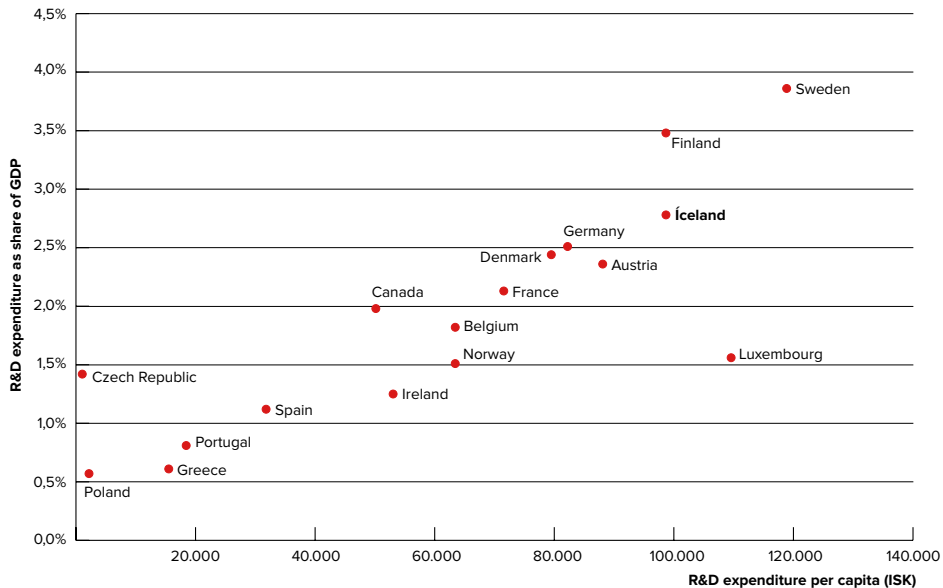


Table 2. R&D expenditure per capita in the Nordic countries (ISK) in 2005 by sector and R&D expenditure as a proportion of GDP.

MISK Sector of performance	Denmark	%	Finland	%	Iceland	%	Norway	%	Sweden	%
Business sector	54.187	68	69.968	71	50.017	51	34.075	54	88.062	74
Public sector	6.276	8	10.764	11	23.657	24	9.858	16	5.955	5
Higher education	19.039	24	17.941	18	25.008	25	19.502	31	24.850	21
TOTAL	79.501	100	98.673	100	98.682	100	63.435	100	118.866	100
% Sector of performance	Denmark		Finland		Iceland		Norway		Sweden	
Business sector	1,6		2,5		1,4		0,8		2,9	
Public sector	0,2		0,4		0,7		0,2		0,2	
Higher education	0,6		0,6		0,7		0,5		0,8	
TOTAL	2,4		3,5		2,8		1,5		3,9	
GDP (MISK)	15.675.641		11.844.193		1.012.201		17.869.451		21.357.254	

Table 3. R&D personnel (FTE) in the Nordic countries in 2005 by sector and researchers there of.

Total R&D personnel (FTE)										
	Denmark	%	Finland	%	Iceland	%	Norway	%	Sweden	%
Business sector	28.461	66	32.109	56	1.530	47	16.710	55	56.941	73
Public sector	3.078	7	7.422	13	955	30	5.147	17	3.391	4
Higher education	11.668	27	17.453	31	741	23	8.700	28	17.223	22
TOTAL	43.207	100	56.984	100	3.226	100	30.557	100	77.555	100
Researchers (there of)										
	Denmark	%	Finland	%	Iceland	%	Norway	%	Sweden	%
Business sector	17.664	63	21.967	56	1.012	47	11.402	52	34.055	63
Public sector	2.029	7	4.374	11	558	26	3.449	16	2.844	5
Higher education	8.287	30	12.879	33	585	27	7.000	32	16.792	31
TOTAL	27.980	100	39.220	100	2.155	100	21.851	100	53.691	100

Table 4. R&D personnel (FTE) by sector of performance and occupation in 2005.

Sector	Researchers / Professionals	%	Technicians	%	Support staff	%	TOTAL	%
Business sector	1.011,5	47	321,4	48	196,6	49	1.529,5	47
Higher education	585,1	27	90,5	14	65,9	16	741,5	23
Public sector	501,3	23	221,9	33	126,0	31	849,2	26
Private non-profit	57,0	3	34,9	5	13,8	3	105,7	3
TOTAL	2.154,9	100	668,7	100	402,3	100	3.225,9	100
%	66,8		20,7		12,5		100	

Table 5. Researchers in the Nordic countries (head count) and share of women there of in 2001, 2003 and 2005.

Total researchers			
	2001	2003	2005
Denmark	29.791	36.046	39.533*
Finland	47.534	53.430	51.219
Iceland	3.231	3.517	3.821
Norway	34.864	35.700	37.013
Sweden	-	-	-**
Share of (%) women researchers			
	2001	2003	2005
Denmark	28,0	28,1	35,7*
Finland	29,1	29,8	29,0
Iceland	34,7	39,4	39,3
Norway	28,3	29,4	31,7
Sweden	-	-	-**

* Figures from 2004. Statistics on the number of researchers in Denmark were incomplete at the time of printing.

** Statistics on the number of researchers in Sweden were not available at the time of printing.

Figure 6. OECD countries' relative citation impacts in 1991 to 1995 and 2001 to 2005. Countries listed in order of the citation impacts for the most recent period.

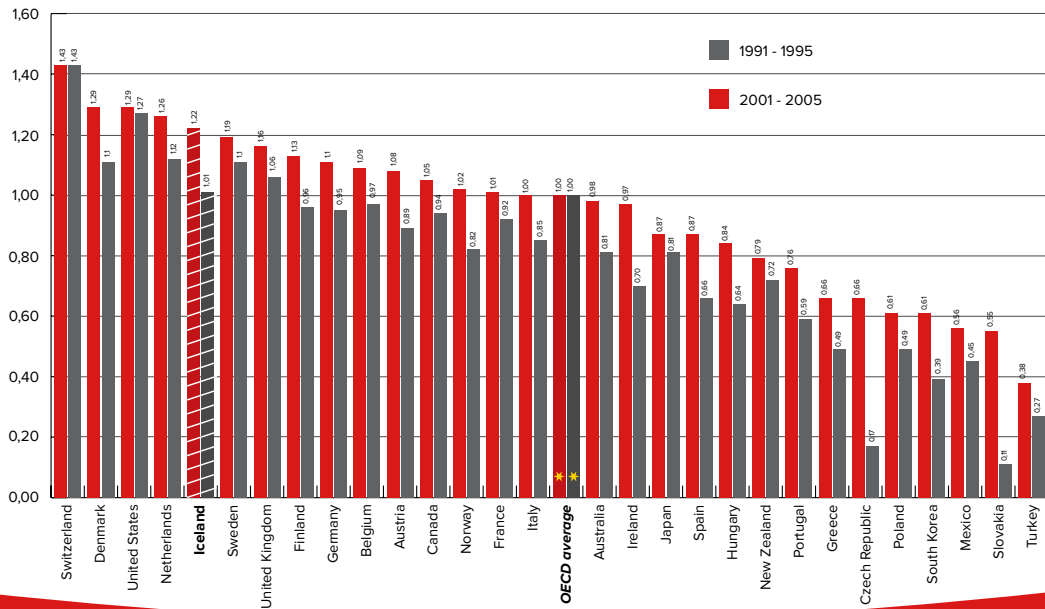


Table 6. Relative citation impacts for OECD countries by major fields of science in 2001 to 2005. Countries listed in order of their relative citation impact.

Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities	
1 United States	1,30	1 Switzerland	1,50	1 Switzerland	1,36	1 Finland	1,56	1 United States	1,16	1 Greece	1,94
2 Switzerland	1,30	2 Denmark	1,43	2 United States	1,30	2 Iceland	1,48	2 Hungary	1,12	2 Denmark	1,64
3 Iceland	1,23	3 Netherlands	1,30	3 Iceland	1,29	3 Denmark	1,42	3 Netherlands	1,08	3 Netherlands	1,60
4 United Kingdom	1,22	4 United States	1,21	4 Denmark	1,29	4 United Kingdom	1,39	4 Canada	1,04	4 Iceland	1,33
5 Netherlands	1,21	5 Austria	1,17	5 Belgium	1,26	5 Norway	1,38	5 United Kingdom	1,00	5 Portugal	1,29
6 Denmark	1,17	6 Germany	1,14	6 Finland	1,25	6 Svíþjóð	1,37	<i>OECD average</i>	<i>1,00</i>	6 New Zealand	1,29
7 Sweden	1,10	7 Belgium	1,12	7 Netherlands	1,24	7 Netherlands	1,31	6 Belgium	0,98	7 United Kingdom	1,27
8 Germany	1,08	8 Sweden	1,11	8 Canada	1,20	8 Ireland	1,22	7 Germany	0,96	8 Svíþjóð	1,25
9 Austria	1,05	9 France	1,05	9 Svíþjóð	1,17	9 France	1,18	8 Italy	0,94	9 Japan	1,19
10 Canada	1,00	10 Finland	1,01	10 United Kingdom	1,17	10 United States	1,17	9 Svíþjóð	0,91	10 United States	1,17
<i>OECD average</i>	<i>1,00</i>	11 Norway	1,01	11 Norway	1,15	11 Switzerland	1,15	10 France	0,90	11 Australia	1,06
11 Ireland	0,98	<i>OECD average</i>	<i>1,00</i>	12 Australia	1,06	12 Belgium	1,13	11 Finland	0,88	12 Norway	1,01
12 Finland	0,96	12 Spain	0,99	13 Italy	1,06	13 Canada	1,07	12 Norway	0,87	13 Finland	1,00
13 France	0,94	13 United Kingdom	0,98	14 Germany	1,04	14 Portugal	1,07	13 Denmark	0,86	<i>OECD average</i>	<i>1,00</i>
14 Belgium	0,94	14 Portugal	0,91	15 France	1,04	15 Australia	1,06	14 Switzerland	0,85	14 Italy	0,95
15 Australia	0,94	15 Italy	0,90	16 Ireland	1,03	16 New Zealand	1,04	15 Australia	0,85	15 Mexico	0,93
16 Norway	0,88	16 Ireland	0,90	17 Luxembourg	1,01	17 Italy	1,03	16 Iceland	0,81	16 Canada	0,93
17 Italy	0,85	17 Japan	0,90	18 Austria	1,01	18 Luxembourg	1,01	17 New Zealand	0,77	17 Turkey	0,89
18 Japan	0,83	18 Australia	0,89	<i>OECD average</i>	<i>1,00</i>	19 Spain	1,00	18 Austria	0,75	18 Austria	0,86
19 Spain	0,80	19 Canada	0,89	19 Spain	0,95	<i>OECD average</i>	<i>1,00</i>	19 Mexico	0,70	19 Germany	0,81

20 Hungary	0,75	20 Czech Republic	0,88	20 New Zealand	0,94	20 Greece	1,00	20 Spain	0,68	20 Belgium	0,79
21 New Zealand	0,74	21 New Zealand	0,88	21 Portugal	0,94	21 Germany	0,89	21 Ireland	0,68	21 Poland	0,77
22 Portugal	0,70	22 Hungary	0,87	22 Hungary	0,93	22 South Korea	0,83	22 Poland	0,65	22 Ireland	0,64
23 Greece	0,65	23 Iceland	0,84	23 Czech Republic	0,83	23 Japan	0,81	23 South Korea	0,62	23 Switzerland	0,61
24 Luxembourg	0,65	24 South Korea	0,78	24 Japan	0,83	24 Austria	0,79	24 Japan	0,60	24 Hungary	0,58
25 South Korea	0,64	25 Greece	0,76	25 Poland	0,78	25 Czech Republic	0,61	25 Luxembourg	0,56	25 South Korea	0,54
26 Czech Republic	0,61	26 Slovakia	0,76	26 Slovakia	0,73	26 Mexico	0,55	26 Portugal	0,53	26 Czech Republic	0,52
27 Poland	0,57	27 Mexico	0,71	27 Greece	0,66	27 Slovakia	0,51	27 Turkey	0,53	27 Spain	0,51
28 Slovakia	0,53	28 Turkey	0,63	28 Mexico	0,64	28 Poland	0,45	28 Greece	0,50	28 France	0,49
29 Mexico	0,50	29 Poland	0,60	29 South Korea	0,59	29 Hungary	0,43	29 Czech Republic	0,28	29 Luxembourg	0,49
30 Turkey	0,42	30 Luxembourg	0,45	30 Turkey	0,33	30 Turkey	0,41	30 Slovakia	0,20	30 Slovakia	0,27

Figure 7. Publications by scientists in Iceland from 1981 to 2005.

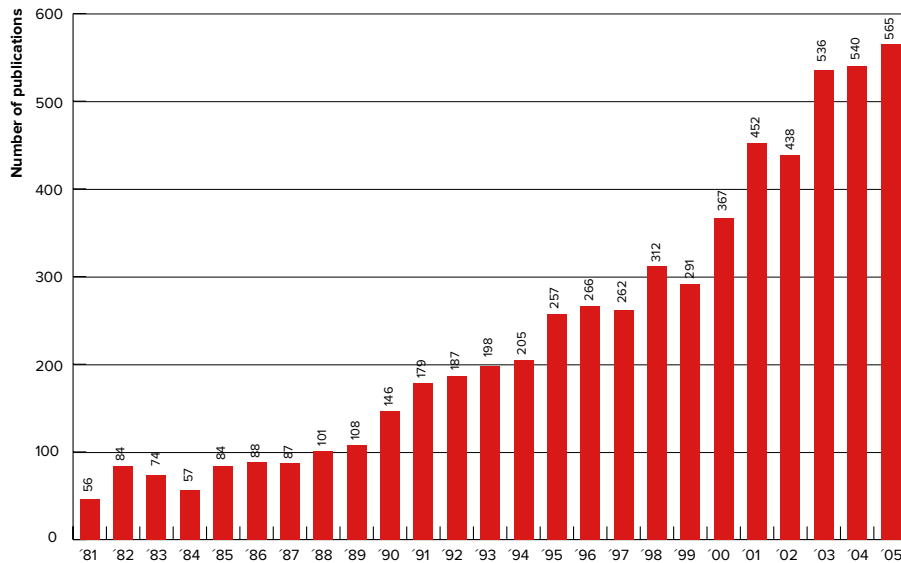


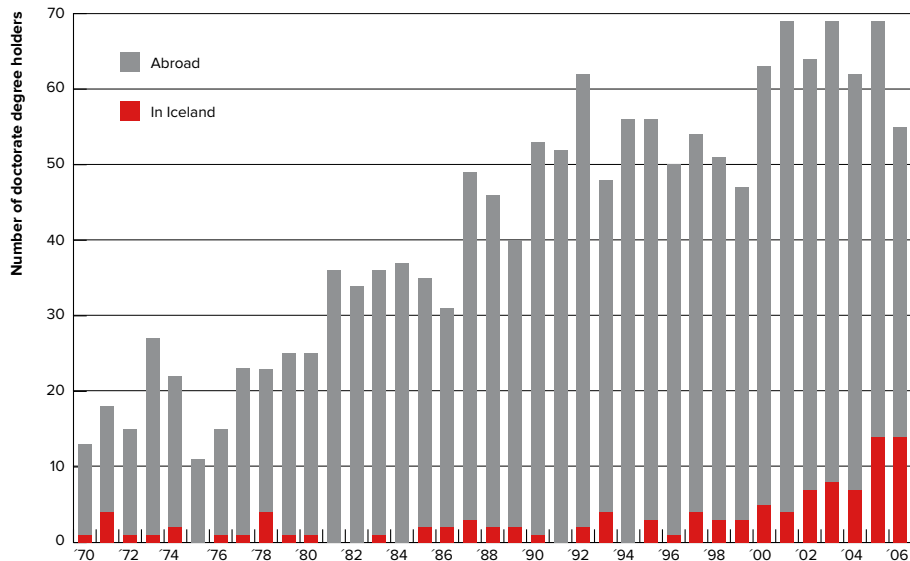
Table 7. Shares of population with higher education and engaged in life-long learning in 2003 and 2005.

	Proportion of population aged 25-64 with higher education (%)		Proportion of population engaged in life-long learning (%)	
	2003	2005	2003	2005
Denmark	32,9	33,5	27,6	27,6
Finland	34,2	34,6	24,6	24,8
Iceland	29,2	30,6	31,7	26,6
Norway	32,3	32,6	19,1	19,4
Sweden	28,2	29,2	35,8	34,7
EU-25	21,9	22,8	10,7	11,0
Japan	37,4	-	-	-
USA	38,4	-	-	-

Table 8. Patent applications at the European Patent Office per million population in 1993 and 2003.

	1993	2003
Switzerland	259,2	425,6
Germany	155,7	311,7
Finland	155,8	305,6
Sweden	164,9	284,9
Netherlands	105,3	244,3
Denmark	111,2	235,8
Japan	93,0	219,1
Austria	92,1	195,1
USA	91,9	167,6
EU-15	84,7	160,6
Iceland	23,2	153,6
France	87,7	149,1
Belgium	86,4	144,5
UK	76,3	121,4
Norway	59,1	117,1

Figure 8. Graduations of Icelandic doctorates in Iceland and abroad from 1970 to 2006.



* The number of graduations in 2006 is most likely incomplete.

Figure 9. Graduations of Icelandic doctorates from 1997 to 2006 by field of science.

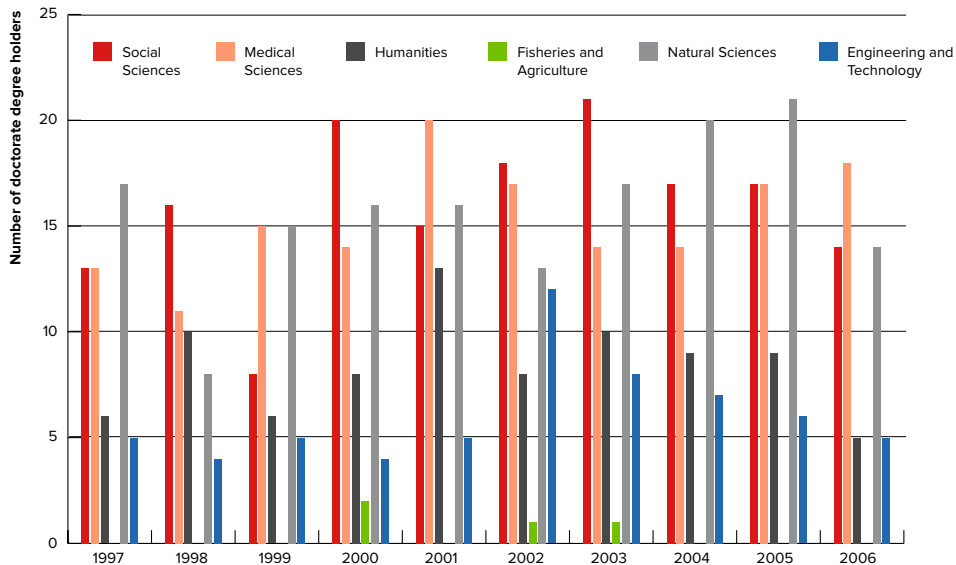


Figure 10. Icelandic doctorate degree holders from 1970 to 2006 by gender and field of science.

