



*Centre for the
Study of Living Standards
Centre d'étude des
niveaux de vie*

111 Sparks Street, Suite 500
Ottawa, Ontario K1P 5B5
613-233-8891, Fax 613-233-8250
csls@csls.ca

Research Trends and Issues in Canada

**Dr. Andrew Sharpe
Executive Director
Centre for the Study of Living Standards**

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Canada's Productivity Performance

- Since 2000, Canada's labour productivity performance has deteriorated relative to both our performance during the second half of the 1990s and relative to the performance of labour productivity in the United States in the 2000s. Business sector output per hour advanced at a 1.1 per cent average annual rate in Canada between 2000 and 2006, only about one third the annual rate of advance of 2.9 per cent recorded in Canada between 1996 and 2000 and only one third the annual rate of increase of 3.0 per cent recorded in the United States since 2000 (Chart 1).
- According to Industry Canada estimates, Canada's lagging labour productivity growth has resulted in the widening of the business sector labour productivity gap from 17 percentage points in 2000 (83 per cent the US level) to 26 points in 2006 (74 per cent the US level) (Chart 2).
- The causes of the fall-off in labour productivity growth in Canada after 2000 are still poorly understood. Possible explanations include measurement problems; weak productivity growth in resources industries exploiting poorer quality resources such as the oil sands; weak ICT investment; a failure to exploit advanced technologies; and weak wage growth leading to a slower rate of substitution of capital for labour.
- From an international perspective, Canada's relative productivity performance has been weak. Over the 1973-2004 period, Canada had the third lowest rate of growth of output per hour among 23 OECD countries at 1.2 per cent per year (Charts 3 and 4). This resulted in Canada's level of output per worker falling from 4th highest in the OECD in 1950 to 17th in 2004 (Chart 5).
- The level of output per hour in Ontario in 2005 was 104 per cent of the national average (Chart 6). Over the 1987-2005 it fluctuated between 102 and 106 per cent of the national average.

Trends in Research and Development in Canada

R&D by performing sector

- In 2006, gross expenditure on research and development (GERD) in Canada was \$28.4 billion, with \$14.9 billion performed by business enterprises (52 per cent), \$10.9 billion by higher education (38 per cent), and \$2.5 billion by the government sector (9 per cent) (Tables 1 and 1b).
- Within the government sector in 2006, the federal government was responsible for 86 per cent of R&D performed, provincial governments 13 per cent, and provincial research organizations 1 per cent.
- In 2006, the GERD/GDP ratio or R&D intensity in Canada was 1.97 per cent, up from 1.31 per cent in 1971, but down from the peak of 2.09 per cent in 2001 (Chart 7 and Table 1a).
- The increase in R&D intensity in Canada over the 1971-2006 period was due to increased business enterprise R&D intensity, up 0.61 percentage points from 0.42 per cent of GDP in 1971 to 1.03 per cent in 2006, and increased higher education R&D, up 0.32 percentage points from 0.44 per cent to 0.76 per cent. Government R&D actually fell 0.26 percentage points from 0.43 per cent to 0.17 per cent (Table 1a).
- All the increase in the R&D intensity of the higher education sector has taken place since 1997. Current dollar R&D performed in the higher education sector nearly tripled from \$3.9 billion in 1997 to \$10.9 billion in 2006 (Table 1).

R&D by funding sector

- In contrast to the government sector's limited R&D performance (9 cent of total R&D), this sector in 2006 was responsible for 24 per cent of R&D funding. The federal government accounted for 18 per cent of total R&D funding and provincial governments 6 per cent (Table 2b).
- The federal government's relative importance as a R&D funder in 2006 was well less than one half of what it had been in 1971 (18 per cent versus 46 per cent of total R&D). In contrast, the relative importance of business enterprises in R&D nearly doubled (from 26 per cent to 47 per cent) and the relative importance of provincial government was stable at around 6 per cent. Foreign sector funding more than quadrupled from 2 per cent to 9 per cent. (Table 2b)

Provincial Trends in R&D

Overall trends

- In 2004, the most recent year for which provincial data are available, gross expenditures on research and development was \$11.7 billion in Ontario (45 per cent of the national total), \$7.6 billion in Quebec (28 per cent), \$5.3 billion in the West (21 per cent), and \$0.9 billion in Atlantic Canada (3 per cent) (Table 3 and 3b).
- In 2004, Quebec had the highest R&D intensity of any province region at 2.72 per cent, followed by Ontario (2.26 per cent), the West (1.24 per cent) and Atlantic Canada (1.14 per cent). Central Canada thus has more than double the R&D intensity of the rest of the country. Statistics for the regions can hide provincial performances. For example, in 2004 Nova Scotia had a higher R&D intensity than any of the Western provinces, and was third behind Quebec and Ontario (Chart 9 and Table 3a).
- British Columbia had the fastest growth in R&D over the 1979-2004 period at 11.1 per cent per year, followed by Quebec (10.6 per cent) and Ontario (10.0 per cent). All other provinces had R&D growth below the national average of 9.0 per cent (Table 3).
- The greater R&D intensity of Quebec and Ontario is explained by the much greater strength of business enterprise R&D in these two provinces. These two provinces alone accounted for 83 per cent of total business enterprise R&D in Canada in 2004 (Table 4b), with business enterprise R&D intensity well above that of other provinces (Chart 10). Nearly two thirds of total R&D in these provinces was performed by business enterprises (Table 5).
- Government sector R&D accounted for more than half of total R&D performed in each of the four Atlantic provinces and in Saskatchewan in 2004, reflecting the weakness of business sector R&D.

Ontario

- R&D intensity in Ontario rise from 1.27 per cent of GDP in 1979 to 2.26 per cent in 2004 (Chart 11 and Table 7a). Business enterprise R&D grew 0.57 percentage points from 0.87 per cent of GDP to 1.44 per cent while higher education R&D increased 0.51 points from 0.23 per cent to 0.74 per cent.
- Ontario's population in 2004 was 12.4 million, 65 per cent greater than Quebec's population of 7.5 million. Federal government R&D performed in Ontario was \$329 million, 2 per cent above the \$321 million performed in Quebec (Table 5).

Federal government funding of R&D in Ontario was \$1,327 million (Table 6), 28 per cent above the \$1,057 million funded in Quebec.

- The Ontario government performed R&D valued at \$86 million in 2004 (Table 5), behind that performed by the Alberta government (\$113 million). The Ontario government funded R&D valued at \$429 million (Table 6), only slightly ahead of that funded by the Quebec government (\$321 million).
- The nominal value of R&D performed by the Ontario government grew at a 4.4 per cent average annual rate over the 1979-2004 period, well below the 10.0 per cent rate of growth for total R&D in Ontario (Table 7). But R&D funded by the Ontario government grew 9.0 per cent per year, only slightly below that of total R&D (Table 8).
- Ontario accounts for around 70 per cent of the R&D performed in Canada in the communications equipment and the semiconductors sectors and over half the R&D for information systems and the cultural and information industry (Chart 13).

Science and Technology in Canada in International Perspective

According to OECD data, Canada is not a world leader on most science and technology indicators.

- In terms of R&D intensity, Canada in 2004 ranked 12th out of 35 OECD countries for which the OECD compiles R&D statistics (Chart 15). Quebec would rank fifth after Sweden, Finland, Japan, and Iceland, but ahead of the United States and Korea. Ontario would rank tenth.
- The OECD defines “investment in knowledge” as the sum of expenditures on R&D, higher education, and software. Canada ranked 7th out of 20 OECD countries for this indicator in 2002 (Chart 16).
- In terms of researchers per 1,000 full-time equivalent employed persons, Canada in 2004 ranked 12 out of 35 countries (Chart 17).
- In terms of triadic patent families, Canada in 2002 ranked 15th out of 32 countries (Chart 18).

Key Public Policy Science and Technology Questions Facing Canada

There are many public policy science and technology questions in Canada that need fresh research and analysis. Some of the key questions are highlighted below.

- How effective is government support for business sector R&D? Are the federal and provincial tax credits for R&D too generous? Is there a high degree of incrementality associated with these tax credits? Should governments rebalance their support for private sector R&D by reallocated resources from tax credits to grants as Richard Harris of Simon Fraser University has argued?
- Do governments have the right balance between support for private sector R&D and support for adoption of advanced technologies through technology transfer programs like the National Research Council's Industrial Research and Assistance Program (IRAP)? Less than 1 per cent of Canadian firms actually undertake R&D but all firms adopt new technologies and managerial practices?
- Is it possible to measure the return on investment for society on the large amounts of funds that governments have allocated to the higher education sector in recent years? Or since much of this research is basic in nature with no immediate payoff, or in areas such as health that improve well-being but give little financial return, is a return on investment approach the appropriate framework?
- Government in the last decade has shown a marked preference to use their resources to fund research in the higher education sector rather than perform research in their own institutions. Is this behavior supported by evidence of greater effectiveness in, or higher returns to, R&D performed by the higher education sector over that performed by government?

Research on Output and Outcomes in the Health Sector

After severe cut-backs in the mid-1990s, the health sector has been allocated increased resources for both research and provision of services in recent years. As highlighted by the recent Health Council of Canada report *Measuring Up* released this January, the metrics of gauge the outcomes from both the point of view of the individual and society are lacking in this country. The Centre for the Study of Living Standards and the Canadian Medical Association are organizing an invitational conference, tentatively scheduled for Ottawa this June, to address this issue of the measurement of output and outcomes in the health sector. Some of the issues and problems that will be addressed at the conference include the following.

- The national accounts estimates of the real output of the health sector produced by Statistics Canada are the nominal value of inputs deflated by cost indexes of these inputs. These estimates consequently fail to capture any productivity gains in the health sector and hence may be providing a faulty signal of its true performance. Is it possible to develop different types of health sector outputs that can be measured independently of inputs (e.g. number of operations performed, hospital days, consultations) and that can be aggregated to approximate the output of the health? It will be very important to take account of any change in the quality of these outputs.
- The most widely used summary outcome measure of health is life expectancy. But how does one value increases in life expectancy to calculate rates of return to health investments? William Nordhaus from Yale University has calculated that the economic value of increased longevity over the last century have been about as large as the value of measured gains in non-health goods and services, making the “medical revolution the greatest benefit to mankind.” This finding implies that the social productivity of health care spending may be many times that of other types of spending.
- A related issue is to what degree can increases in life expectancy be attributed to gains from medical research, as opposed to advances in the pharmaceutical sector, or to improved public health, or changes in societal behaviors detrimental to health such as smoking?

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Table 1: General Expenditures on Research and Development (GERD) by Performer in Canada,¹ 1971-2006

(millions of current \$)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector
		Total	Federal	Provincial (except PROS)	PROS ²			
1971	1,285	426	383	34	9	413	436	10
1972	1,372	464	414	39	11	462	434	12
1973	1,470	505	450	41	14	503	449	13
1974	1,689	576	508	52	16	613	485	15
1975	1,901	617	545	53	19	700	568	16
1976	2,071	675	593	59	23	755	624	17
1977	2,322	731	638	66	27	857	713	21
1978	2,609	809	711	70	28	1,006	769	25
1979	3,044	830	717	80	33	1,266	921	27
1980	3,575	919	779	97	43	1,571	1,055	30
1981	4,415	1,078	916	109	53	2,124	1,177	36
1982	5,198	1,297	1,103	138	56	2,489	1,373	39
1983	5,517	1,420	1,219	141	60	2,602	1,452	43
1984	6,273	1,595	1,389	139	67	3,022	1,604	52
1985	6,985	1,569	1,356	134	79	3,635	1,722	59
1986	7,546	1,624	1,407	149	68	4,022	1,839	61
1987	7,950	1,611	1,383	151	77	4,341	1,934	64
1988	9,045	1,671	1,429	162	80	4,623	2,669	82
1989	9,517	1,805	1,533	188	84	4,779	2,844	89
1990	10,260	1,956	1,654	206	96	5,169	3,033	102
1991	10,767	2,013	1,685	238	90	5,355	3,289	110
1992	11,338	2,009	1,716	208	85	5,742	3,519	68
1993	12,184	2,026	1,757	192	77	6,424	3,660	74
1994	13,341	2,013	1,753	197	63	7,567	3,675	86
1995	13,754	1,982	1,727	186	68	7,991	3,691	91
1996	13,817	2,034	1,792	163	79	7,997	3,697	89
1997	14,634	1,934	1,720	156	58	8,739	3,879	82
1998	16,088	1,959	1,743	155	61	9,682	4,370	77
1999	17,637	2,093	1,859	173	60	10,400	5,082	63
2000	20,580	2,335	2,080	189	66	12,395	5,793	57
2001	23,169	2,410	2,103	284	23	14,272	6,424	63
2002	23,539	2,505	2,190	289	26	13,516	7,455	63
2003	24,337	2,398	2,083	291	24	13,704	8,143	92
2004	26,003	2,409	2,083	301	25	14,441	9,037	116
2005	27,174	2,497	2,162	311	25	14,655	9,900	121
2006	28,357	2,490	2,145	320	25	14,850	10,890	127
Average Annual Growth Rates, %								
71-06	9.24	5.17	5.05	6.62	2.96	10.78	9.63	7.53
71-81	13.14	9.73	9.11	12.36	19.40	17.79	10.44	13.67
81-06	7.72	3.41	3.46	4.40	-2.96	8.09	9.31	5.17
81-89	10.08	6.66	6.65	7.05	5.93	10.67	11.66	11.98
89-00	7.26	2.37	2.81	0.05	-2.17	9.05	6.68	-3.97
89-96	5.47	1.72	2.26	-2.02	-0.87	7.63	3.82	0.00
96-06	7.45	2.04	1.81	6.98	-10.87	6.38	11.41	3.62

Source: CANSIM II: v13682131,v617571,v617480,v617505,v617526, v617624,v617679 and v617750.

Note:1 Includes all funders and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

Table 1a: General Expenditures on Research and Development (GERD) as a Proportion of Gross Domestic Product by Performer in Canada,¹ 1971-2006

(in per cent)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector
		Total	Federal	Provincial (except PROS) ²	PROS ²			
1971	1.31	0.43	0.39	0.03	0.01	0.42	0.44	0.01
1972	1.25	0.42	0.38	0.04	0.01	0.42	0.39	0.01
1973	1.14	0.39	0.35	0.03	0.01	0.39	0.35	0.01
1974	1.10	0.37	0.33	0.03	0.01	0.40	0.31	0.01
1975	1.09	0.36	0.31	0.03	0.01	0.40	0.33	0.01
1976	1.04	0.34	0.30	0.03	0.01	0.38	0.31	0.01
1977	1.05	0.33	0.29	0.03	0.01	0.39	0.32	0.01
1978	1.07	0.33	0.29	0.03	0.01	0.41	0.31	0.01
1979	1.09	0.30	0.26	0.03	0.01	0.45	0.33	0.01
1980	1.14	0.29	0.25	0.03	0.01	0.50	0.34	0.01
1981	1.22	0.30	0.25	0.03	0.01	0.59	0.33	0.01
1982	1.37	0.34	0.29	0.04	0.01	0.66	0.36	0.01
1983	1.34	0.35	0.30	0.03	0.01	0.63	0.35	0.01
1984	1.40	0.35	0.31	0.03	0.01	0.67	0.36	0.01
1985	1.44	0.32	0.28	0.03	0.02	0.75	0.35	0.01
1986	1.47	0.32	0.27	0.03	0.01	0.78	0.36	0.01
1987	1.42	0.29	0.25	0.03	0.01	0.78	0.35	0.01
1988	1.48	0.27	0.23	0.03	0.01	0.75	0.44	0.01
1989	1.45	0.27	0.23	0.03	0.01	0.73	0.43	0.01
1990	1.51	0.29	0.24	0.03	0.01	0.76	0.45	0.02
1991	1.57	0.29	0.25	0.03	0.01	0.78	0.48	0.02
1992	1.62	0.29	0.24	0.03	0.01	0.82	0.50	0.01
1993	1.68	0.28	0.24	0.03	0.01	0.88	0.50	0.01
1994	1.73	0.26	0.23	0.03	0.01	0.98	0.48	0.01
1995	1.70	0.24	0.21	0.02	0.01	0.99	0.46	0.01
1996	1.65	0.24	0.21	0.02	0.01	0.96	0.44	0.01
1997	1.66	0.22	0.19	0.02	0.01	0.99	0.44	0.01
1998	1.76	0.21	0.19	0.02	0.01	1.06	0.48	0.01
1999	1.80	0.21	0.19	0.02	0.01	1.06	0.52	0.01
2000	1.91	0.22	0.19	0.02	0.01	1.15	0.54	0.01
2001	2.09	0.22	0.19	0.03	0.00	1.29	0.58	0.01
2002	2.04	0.22	0.19	0.03	0.00	1.17	0.65	0.01
2003	2.01	0.20	0.17	0.02	0.00	1.13	0.67	0.01
2004	2.01	0.19	0.16	0.02	0.00	1.12	0.70	0.01
2005	1.98	0.18	0.16	0.02	0.00	1.07	0.72	0.01
2006 ³	1.97	0.17	0.15	0.02	0.00	1.03	0.76	0.01
Average Annual Growth Rates, %								
71-06	1.18	-2.59	-2.71	-1.25	-4.64	2.60	1.54	-0.40
71-81	-0.64	-3.63	-4.17	-1.32	4.86	3.45	-3.00	-0.17
81-06	1.92	-2.17	-2.11	-1.22	-8.19	2.26	3.42	-0.50
81-89	2.11	-1.07	-1.07	-0.70	-1.75	2.65	3.57	3.87
89-00	2.56	-2.12	-1.69	-4.33	-6.45	4.27	2.01	-8.18
89-96	1.90	-1.72	-1.20	-5.33	-4.23	3.99	0.31	-3.38
96-06	1.78	-3.35	-3.56	1.33	-15.58	0.76	5.52	-1.85

Source: Table 1 and GDP data from CANSIM II: V646937.

Note: 1 Includes all funders and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

3. Nominal GDP growth is assumed to have been 5 per cent in 2006.

Table 1b: Distribution of General Expenditures on Research and Development (GERD) by Performer in Canada,¹ 1971-2006

(per cent)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector
		Total	Federal	Provincial (except PROS) ²	PROS ²			
1971	100.0	33.2	29.8	2.6	0.7	32.1	33.9	0.8
1972	100.0	33.8	30.2	2.8	0.8	33.7	31.6	0.9
1973	100.0	34.4	30.6	2.8	1.0	34.2	30.5	0.9
1974	100.0	34.1	30.1	3.1	0.9	36.3	28.7	0.9
1975	100.0	32.5	28.7	2.8	1.0	36.8	29.9	0.8
1976	100.0	32.6	28.6	2.8	1.1	36.5	30.1	0.8
1977	100.0	31.5	27.5	2.8	1.2	36.9	30.7	0.9
1978	100.0	31.0	27.3	2.7	1.1	38.6	29.5	1.0
1979	100.0	27.3	23.6	2.6	1.1	41.6	30.3	0.9
1980	100.0	25.7	21.8	2.7	1.2	43.9	29.5	0.8
1981	100.0	24.4	20.7	2.5	1.2	48.1	26.7	0.8
1982	100.0	25.0	21.2	2.7	1.1	47.9	26.4	0.8
1983	100.0	25.7	22.1	2.6	1.1	47.2	26.3	0.8
1984	100.0	25.4	22.1	2.2	1.1	48.2	25.6	0.8
1985	100.0	22.5	19.4	1.9	1.1	52.0	24.7	0.8
1986	100.0	21.5	18.6	2.0	0.9	53.3	24.4	0.8
1987	100.0	20.3	17.4	1.9	1.0	54.6	24.3	0.8
1988	100.0	18.5	15.8	1.8	0.9	51.1	29.5	0.9
1989	100.0	19.0	16.1	2.0	0.9	50.2	29.9	0.9
1990	100.0	19.1	16.1	2.0	0.9	50.4	29.6	1.0
1991	100.0	18.7	15.6	2.2	0.8	49.7	30.5	1.0
1992	100.0	17.7	15.1	1.8	0.7	50.6	31.0	0.6
1993	100.0	16.6	14.4	1.6	0.6	52.7	30.0	0.6
1994	100.0	15.1	13.1	1.5	0.5	56.7	27.5	0.6
1995	100.0	14.4	12.6	1.4	0.5	58.1	26.8	0.7
1996	100.0	14.7	13.0	1.2	0.6	57.9	26.8	0.6
1997	100.0	13.2	11.8	1.1	0.4	59.7	26.5	0.6
1998	100.0	12.2	10.8	1.0	0.4	60.2	27.2	0.5
1999	100.0	11.9	10.5	1.0	0.3	59.0	28.8	0.4
2000	100.0	11.3	10.1	0.9	0.3	60.2	28.1	0.3
2001	100.0	10.4	9.1	1.2	0.1	61.6	27.7	0.3
2002	100.0	10.6	9.3	1.2	0.1	57.4	31.7	0.3
2003	100.0	9.9	8.6	1.2	0.1	56.3	33.5	0.4
2004	100.0	9.3	8.0	1.2	0.1	55.5	34.8	0.4
2005	100.0	9.2	8.0	1.1	0.1	53.9	36.4	0.4
2006	100.0	8.8	7.6	1.1	0.1	52.4	38.4	0.4
Percentage Percent Changes								
71-06	n.a.	-24.4	-22.2	-1.5	-0.6	20.2	4.5	-0.3
71-81	n.a.	-8.73	-9.06	-0.18	0.50	15.97	-7.27	0.04
81-06	n.a.	-15.64	-13.18	-1.34	-1.11	4.26	11.74	-0.37
81-89	n.a.	-5.45	-4.64	-0.49	-0.32	2.11	3.22	0.12
89-00	n.a.	-7.62	-6.00	-1.06	-0.56	10.01	-1.73	-0.66
89-96	n.a.	-4.25	-3.14	-0.80	-0.31	7.66	-3.13	-0.29
96-06	n.a.	-5.94	-5.41	-0.05	-0.48	-5.51	11.65	-0.20

Source: Table 1.

Note:1 Includes all funders and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

Table 2: General Expenditures on Research and Development (GERD) by Funder in Canada,¹ 1971-2006

(millions of current \$)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector	Foreign Sector
		Total	Federal	Provincial (except PROS) ²	PROS ²				
1971	1,285	665	589	76	0	331	226	38	25
1972	1,372	716	625	91	0	373	212	42	29
1973	1,470	772	673	99	0	409	210	47	32
1974	1,689	859	744	114	1	511	231	53	35
1975	1,901	919	793	123	3	582	294	57	49
1976	2,071	1,004	855	148	1	625	332	60	50
1977	2,322	1,107	936	170	1	702	383	66	64
1978	2,609	1,217	1,028	187	2	839	390	88	75
1979	3,044	1,275	1,064	208	3	1,104	507	76	82
1980	3,575	1,444	1,195	246	3	1,392	558	80	101
1981	4,415	1,776	1,473	296	7	1,800	573	97	169
1982	5,198	2,147	1,775	370	2	1,971	707	95	278
1983	5,517	2,363	1,977	385	1	1,912	685	112	445
1984	6,273	2,675	2,265	407	3	2,195	751	121	531
1985	6,985	2,716	2,283	426	7	2,762	841	136	530
1986	7,546	2,838	2,368	469	1	3,090	914	142	562
1987	7,950	2,895	2,411	482	2	3,227	909	172	747
1988	9,045	3,076	2,534	539	3	3,416	1,482	209	862
1989	9,517	3,246	2,646	599	1	3,645	1,572	210	844
1990	10,260	3,500	2,859	640	1	3,960	1,618	233	949
1991	10,767	3,642	2,946	695	1	4,113	1,732	267	1,013
1992	11,338	3,753	3,109	643	1	4,445	1,867	224	1,049
1993	12,184	3,821	3,156	665	0	5,025	1,892	276	1,170
1994	13,341	3,758	3,094	663	0	5,874	1,914	298	1,498
1995	13,754	3,641	2,989	652	0	6,288	1,926	309	1,590
1996	13,817	3,444	2,815	629	0	6,397	1,905	358	1,714
1997	14,634	3,470	2,813	657	1	7,031	1,971	367	1,794
1998	16,088	3,470	2,831	639	0	7,354	2,339	372	2,553
1999	17,637	3,985	3,216	767	3	7,917	2,649	380	2,705
2000	20,580	4,439	3,560	878	1	9,225	2,892	445	3,580
2001	23,169	5,143	4,096	1,048	0	11,643	2,928	536	2,918
2002	23,539	5,439	4,254	1,185	0	12,086	3,462	628	1,924
2003	24,337	5,929	4,533	1,396	0	12,057	3,589	637	2,125
2004	26,003	6,073	4,666	1,407	0	12,743	4,126	729	2,332
2005	27,174	6,498	4,977	1,520	0	13,003	4,498	800	2,376
2006	28,357	6,869	5,227	1,644	0	13,246	4,948	877	2,416
Average Annual Growth Rates, %									
71-06	9.24	6.90	6.44	9.18	n.a.	11.12	9.22	9.38	13.95
71-81	13.14	10.32	9.60	14.56	n.a.	18.45	9.75	9.82	21.06
81-06	7.72	5.56	5.20	7.10	n.a.	8.31	9.01	9.21	11.23
81-89	10.08	7.83	7.60	9.21	-21.59	9.22	13.45	10.14	22.27
89-00	7.26	2.89	2.73	3.54	n.a.	8.81	5.70	7.07	14.04
89-96	5.47	0.85	0.89	0.70	n.a.	8.37	2.78	7.92	10.65
96-06	7.45	7.15	6.38	10.08	n.a.	7.55	10.02	9.37	3.49

Source: CANSIM II: v13682131,v13682139,v13682133,v13682135,v13682137,v13682141,v13682143,v13682145,v13682147.

Note:1 Includes all performers and total (natural sciences and engineering, social sciences and humanities) expenditures.
2. PROS refers to provincial research organizations sector.

Table 2a: General Expenditures on Research and Development (GERD) as a Proportion of Gross Domestic Product by Funder in Canada,¹ 1971-2006

(in per cent)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector	Foreign Sector
		Total	Federal	Provincial (except PROS)	PROS ²				
1971	1.31	0.68	0.60	0.08	0.00	0.34	0.23	0.04	0.03
1972	1.25	0.65	0.57	0.08	0.00	0.34	0.19	0.04	0.03
1973	1.14	0.60	0.52	0.08	0.00	0.32	0.16	0.04	0.02
1974	1.10	0.56	0.48	0.07	0.00	0.33	0.15	0.03	0.02
1975	1.09	0.53	0.46	0.07	0.00	0.34	0.17	0.03	0.03
1976	1.04	0.50	0.43	0.07	0.00	0.31	0.17	0.03	0.03
1977	1.05	0.50	0.42	0.08	0.00	0.32	0.17	0.03	0.03
1978	1.07	0.50	0.42	0.08	0.00	0.34	0.16	0.04	0.03
1979	1.09	0.46	0.38	0.07	0.00	0.39	0.18	0.03	0.03
1980	1.14	0.46	0.38	0.08	0.00	0.44	0.18	0.03	0.03
1981	1.22	0.49	0.41	0.08	0.00	0.50	0.16	0.03	0.05
1982	1.37	0.57	0.47	0.10	0.00	0.52	0.19	0.03	0.07
1983	1.34	0.57	0.48	0.09	0.00	0.46	0.17	0.03	0.11
1984	1.40	0.59	0.50	0.09	0.00	0.49	0.17	0.03	0.12
1985	1.44	0.56	0.47	0.09	0.00	0.57	0.17	0.03	0.11
1986	1.47	0.55	0.46	0.09	0.00	0.60	0.18	0.03	0.11
1987	1.42	0.52	0.43	0.09	0.00	0.58	0.16	0.03	0.13
1988	1.48	0.50	0.41	0.09	0.00	0.56	0.24	0.03	0.14
1989	1.45	0.49	0.40	0.09	0.00	0.55	0.24	0.03	0.13
1990	1.51	0.51	0.42	0.09	0.00	0.58	0.24	0.03	0.14
1991	1.57	0.53	0.43	0.10	0.00	0.60	0.25	0.04	0.15
1992	1.62	0.54	0.44	0.09	0.00	0.63	0.27	0.03	0.15
1993	1.68	0.53	0.43	0.09	0.00	0.69	0.26	0.04	0.16
1994	1.73	0.49	0.40	0.09	0.00	0.76	0.25	0.04	0.19
1995	1.70	0.45	0.37	0.08	0.00	0.78	0.24	0.04	0.20
1996	1.65	0.41	0.34	0.08	0.00	0.76	0.23	0.04	0.20
1997	1.66	0.39	0.32	0.07	0.00	0.80	0.22	0.04	0.20
1998	1.76	0.38	0.31	0.07	0.00	0.80	0.26	0.04	0.28
1999	1.80	0.41	0.33	0.08	0.00	0.81	0.27	0.04	0.28
2000	1.91	0.41	0.33	0.08	0.00	0.86	0.27	0.04	0.33
2001	2.09	0.46	0.37	0.09	0.00	1.05	0.26	0.05	0.26
2002	2.04	0.47	0.37	0.10	0.00	1.05	0.30	0.05	0.17
2003	2.01	0.49	0.37	0.12	0.00	0.99	0.30	0.05	0.18
2004	2.01	0.47	0.36	0.11	0.00	0.99	0.32	0.06	0.18
2005	1.98	0.47	0.36	0.11	0.00	0.95	0.33	0.06	0.17
2006 ³	1.97	0.48	0.36	0.11	0.00	0.92	0.34	0.06	0.17
Average Annual Growth Rates, %									
71-06	1.18	-0.99	-1.42	1.12	n.a	2.92	1.16	1.31	5.54
71-81	-0.64	-3.11	-3.74	0.62	n.a	4.03	-3.61	-3.55	6.32
81-06	1.92	-0.13	-0.47	1.33	n.a	2.47	3.13	3.32	5.23
81-89	2.11	0.02	-0.20	1.30	-27.27	1.31	5.23	2.16	13.41
89-00	2.56	-1.62	-1.77	-1.00	-4.38	4.04	1.07	2.38	9.04
89-96	1.90	-2.56	-2.52	-2.71	n.a	4.70	-0.69	4.27	6.91
96-06	1.78	1.49	0.76	4.27	n.a	1.87	4.20	3.60	-1.97

Source: Table 2 and CANSIM II: V646937.

Note:1 Includes all performers and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

3. Nominal GDP growth is assumed to have been 5 per cent in 2006.

Table 2b: Distribution of General Expenditures on Research and Development (GERD) by Funder in Canada,¹ 1971-2006

(in per cent)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector	Foreign Sector
		Total	Federal	Provincial (except PROS) ²	PROS ²				
1971	100	51.8	45.8	5.9	0.0	25.8	17.6	3.0	1.9
1972	100	52.2	45.6	6.6	0.0	27.2	15.5	3.1	2.1
1973	100	52.5	45.8	6.7	0.0	27.8	14.3	3.2	2.2
1974	100	50.9	44.0	6.7	0.1	30.3	13.7	3.1	2.1
1975	100	48.3	41.7	6.5	0.2	30.6	15.5	3.0	2.6
1976	100	48.5	41.3	7.1	0.0	30.2	16.0	2.9	2.4
1977	100	47.7	40.3	7.3	0.0	30.2	16.5	2.8	2.8
1978	100	46.6	39.4	7.2	0.1	32.2	14.9	3.4	2.9
1979	100	41.9	35.0	6.8	0.1	36.3	16.7	2.5	2.7
1980	100	40.4	33.4	6.9	0.1	38.9	15.6	2.2	2.8
1981	100	40.2	33.4	6.7	0.2	40.8	13.0	2.2	3.8
1982	100	41.3	34.1	7.1	0.0	37.9	13.6	1.8	5.3
1983	100	42.8	35.8	7.0	0.0	34.7	12.4	2.0	8.1
1984	100	42.6	36.1	6.5	0.0	35.0	12.0	1.9	8.5
1985	100	38.9	32.7	6.1	0.1	39.5	12.0	1.9	7.6
1986	100	37.6	31.4	6.2	0.0	40.9	12.1	1.9	7.4
1987	100	36.4	30.3	6.1	0.0	40.6	11.4	2.2	9.4
1988	100	34.0	28.0	6.0	0.0	37.8	16.4	2.3	9.5
1989	100	34.1	27.8	6.3	0.0	38.3	16.5	2.2	8.9
1990	100	34.1	27.9	6.2	0.0	38.6	15.8	2.3	9.2
1991	100	33.8	27.4	6.5	0.0	38.2	16.1	2.5	9.4
1992	100	33.1	27.4	5.7	0.0	39.2	16.5	2.0	9.3
1993	100	31.4	25.9	5.5	0.0	41.2	15.5	2.3	9.6
1994	100	28.2	23.2	5.0	0.0	44.0	14.3	2.2	11.2
1995	100	26.5	21.7	4.7	0.0	45.7	14.0	2.2	11.6
1996	100	24.9	20.4	4.6	0.0	46.3	13.8	2.6	12.4
1997	100	23.7	19.2	4.5	0.0	48.0	13.5	2.5	12.3
1998	100	21.6	17.6	4.0	0.0	45.7	14.5	2.3	15.9
1999	100	22.6	18.2	4.3	0.0	44.9	15.0	2.2	15.3
2000	100	21.6	17.3	4.3	0.0	44.8	14.1	2.2	17.4
2001	100	22.2	17.7	4.5	0.0	50.3	12.6	2.3	12.6
2002	100	23.1	18.1	5.0	0.0	51.3	14.7	2.7	8.2
2003	100	24.4	18.6	5.7	0.0	49.5	14.7	2.6	8.7
2004	100	23.4	17.9	5.4	0.0	49.0	15.9	2.8	9.0
2005	100	23.9	18.3	5.6	0.0	47.9	16.6	2.9	8.7
2006	100	24.2	18.4	5.8	0.0	46.7	17.4	3.1	8.5
Percentage Percent Changes									
71-06	n.a.	-27.5	-27.4	-0.1	0.0	21.0	-0.1	0.1	6.6
71-81	n.a.	-11.52	-12.47	0.79	0.16	15.01	-4.61	-0.76	1.88
81-06	n.a.	-16.00	-14.93	-0.91	-0.16	5.94	4.47	0.90	4.69
81-89	n.a.	-6.12	-5.56	-0.41	-0.15	-2.47	3.54	0.01	5.04
89-00	n.a.	-12.54	-10.50	-2.03	-0.01	6.53	-2.47	-0.04	8.53
89-96	n.a.	-9.18	-7.43	-1.74	-0.01	8.00	-2.73	0.38	3.54
96-06	n.a.	-0.70	-1.94	1.25	0.00	0.41	3.66	0.50	-3.89

Source: Table 6.

Note: 1. Includes all performers and total (natural sciences and engineering, social sciences and humanities) expenditures.
2. PROS refers to provincial research organizations sector.

Table 3: General Expenditures on Research and Development (GERD) by Province,¹ 1979-2004

	(in millions of current \$)													
	Canada	Atlantic Canada					Que. ²	Ont. ³	NCR ⁴	Western Canada				
		Nfld.	P.E.I.	N.S.	N.B.	Total				Man.	Sask.	Alta.	B.C.	Total
1979	3,044	24	5	78	62	169	584	1,092	275	86	66	277	166	595
1980	3,575	28	5	83	35	151	670	1,312	310	117	81	351	206	755
1981	4,415	38	7	91	37	173	822	1,667	365	136	85	471	266	958
1982	5,198	48	7	108	47	210	957	2,040	402	162	119	520	299	1,100
1983	5,517	70	7	145	43	265	993	2,237	402	190	124	466	331	1,111
1984	6,273	59	10	160	49	278	1,240	2,483	506	204	135	511	380	1,230
1985	6,985	69	9	169	91	338	1,596	3,109	448	200	174	619	488	1,481
1986	7,546	61	25	179	83	348	1,662	3,465	534	199	176	637	525	1,537
1987	7,950	70	14	170	89	343	1,881	3,687	617	188	169	577	484	1,418
1988	9,045	92	13	271	152	528	2,092	4,059	666	232	176	659	618	1,685
1989	9,517	99	16	235	161	511	2,317	4,224	663	250	189	686	670	1,795
1990	10,260	103	16	236	134	489	2,594	4,444	711	263	201	781	772	2,017
1991	10,767	106	16	240	121	483	2,863	4,616	733	284	216	789	782	2,071
1992	11,338	110	14	233	122	479	3,113	4,818	753	281	235	779	879	2,174
1993	12,184	111	17	245	130	503	3,294	5,331	774	296	233	834	916	2,279
1994	13,341	108	17	265	134	524	3,495	5,940	789	311	239	966	1,067	2,583
1995	13,754	100	16	265	140	521	3,689	6,148	805	295	254	972	1,068	2,589
1996	13,817	103	17	257	150	527	3,801	6,176	771	295	233	1,007	1,002	2,537
1997	14,634	103	17	257	127	504	3,933	6,787	757	269	287	1,052	1,039	2,647
1998	16,088	119	24	311	155	609	4,325	7,465	812	299	278	1,183	1,113	2,873
1999	17,637	127	26	342	165	660	4,885	8,115	808	384	323	1,164	1,290	3,161
2000	20,580	138	36	363	161	698	5,680	9,564	889	412	376	1,337	1,616	3,741
2001	23,169	143	37	378	165	723	6,380	10,887	926	476	396	1,607	1,769	4,248
2002	23,539	153	31	404	217	805	6,660	10,468	1,015	466	433	1,730	1,959	4,588
2003	24,337	168	44	409	217	838	6,898	10,878	999	455	394	1,831	2,039	4,719
2004	26,003	169	40	446	222	877	7,161	11,720	960	519	422	2,053	2,282	5,276
Average Annual Growth Rate, %														
81-89	10.08	12.71	10.89	12.59	20.18	14.50	13.83	12.32	7.75	7.91	10.50	4.81	12.24	8.17
89-00	7.26	3.07	7.65	4.03	0.00	2.88	8.49	7.71	2.70	4.65	6.45	6.25	8.33	6.90
81-04	8.01	6.70	7.87	7.16	8.10	7.31	9.87	8.85	4.29	6.00	7.22	6.61	9.80	7.70
00-04	6.02	5.20	2.67	5.28	8.36	5.87	5.96	5.21	1.94	5.94	2.93	11.32	9.01	8.98
79-04	8.96	8.12	8.67	7.22	5.23	6.81	10.55	9.96	5.13	7.46	7.70	8.34	11.05	9.12
Total Growth Rate, %														
79-04	754.2	604.2	700.0	471.8	258.1	418.9	1126.2	973.3	249.1	503.5	539.4	641.2	1274.7	786.7

Source: CANSIM II series: v13682131, v13682149, v13682181, v13682213, v13682245, v13682277, v13682309, v13682485, v13682341, v13682373, v13682405 and v13682437.

Note: 1 Includes all sectors of funders and all sectors of performers and includes the natural sciences and engineering, social sciences and humanities.

2 Not includes Gatineau and other cities in the National Capital Region.

3 Not includes Ottawa and other cities in the National Capital Region.

4 National Capital Region.

Table 3a: General Expenditures on Research and Development (GERD) as a Proportion of Gross Domestic Product by Province,¹ 1979-2004

	(in percent)												
	Canada	Atlantic Canada					Que. ²	Ont. ³	Western Canada				Total
		Nfld.	P.E.I.	N.S.	N.B.	Total			Man.	Sask.	Alta.	B.C.	
1981	1.22	0.74	0.66	1.14	0.58	0.84	1.02	1.27	1.00	0.58	0.88	0.59	0.76
1982	1.37	0.86	0.61	1.18	0.67	0.91	1.12	1.47	1.15	0.79	0.92	0.66	0.84
1983	1.34	1.17	0.52	1.40	0.53	1.03	1.08	1.45	1.26	0.78	0.80	0.70	0.81
1984	1.40	0.93	0.72	1.40	0.56	0.99	1.24	1.44	1.20	0.79	0.82	0.76	0.84
1985	1.44	1.04	0.62	1.36	0.97	1.13	1.49	1.64	1.08	0.97	0.93	0.91	0.94
1986	1.47	0.84	1.53	1.34	0.79	1.06	1.42	1.66	1.03	0.99	1.10	0.93	1.01
1987	1.42	0.90	0.81	1.18	0.77	0.97	1.46	1.60	0.92	0.93	0.96	0.77	0.88
1988	1.48	1.09	0.68	1.77	1.22	1.39	1.49	1.58	1.05	0.93	1.03	0.89	0.97
1989	1.45	1.10	0.78	1.44	1.23	1.26	1.56	1.52	1.07	0.95	1.02	0.89	0.96
1990	1.51	1.12	0.74	1.39	1.00	1.17	1.69	1.57	1.09	0.95	1.07	0.97	1.02
1991	1.57	1.11	0.71	1.36	0.89	1.12	1.85	1.63	1.18	1.01	1.08	0.96	1.03
1992	1.62	1.15	0.60	1.29	0.87	1.09	1.97	1.68	1.15	1.11	1.04	1.01	1.05
1993	1.68	1.14	0.69	1.34	0.88	1.11	2.03	1.82	1.20	1.02	1.03	0.97	1.02
1994	1.73	1.05	0.67	1.42	0.88	1.12	2.05	1.91	1.20	0.98	1.10	1.06	1.08
1995	1.70	0.94	0.60	1.37	0.85	1.06	2.08	1.87	1.09	0.96	1.06	1.01	1.03
1996	1.65	0.99	0.60	1.32	0.90	1.07	2.11	1.83	1.04	0.81	1.02	0.92	0.96
1997	1.66	0.98	0.61	1.26	0.75	1.00	2.09	1.89	0.90	0.98	0.98	0.91	0.94
1998	1.76	1.06	0.81	1.45	0.88	1.14	2.20	1.98	0.97	0.94	1.10	0.96	1.01
1999	1.80	1.04	0.82	1.48	0.87	1.15	2.32	1.98	1.20	1.05	0.99	1.07	1.05
2000	1.91	0.99	1.07	1.47	0.80	1.13	2.53	2.17	1.21	1.11	0.92	1.23	1.09
2001	2.09	1.01	1.08	1.46	0.80	1.13	2.75	2.40	1.35	1.20	1.06	1.32	1.20
2002	2.04	0.93	0.84	1.49	1.03	1.18	2.76	2.19	1.27	1.26	1.15	1.42	1.28
2003	2.01	0.92	1.16	1.42	0.97	1.15	2.75	2.21	1.22	1.08	1.08	1.40	1.21
2004	2.01	0.87	0.99	1.49	0.95	1.14	2.72	2.26	1.30	1.05	1.09	1.45	1.24
Percentage Point Change													
81-89	0.22	0.36	0.12	0.30	0.64	0.42	0.54	0.24	0.07	0.37	0.14	0.29	0.21
89-00	0.46	-0.11	0.29	0.03	-0.42	-0.14	0.96	0.65	0.14	0.17	-0.09	0.34	0.12
81-04	0.79	0.13	0.34	0.35	0.36	0.30	1.70	0.99	0.31	0.48	0.20	0.86	0.48
00-04	0.10	-0.12	-0.08	0.02	0.14	0.02	0.20	0.09	0.09	-0.06	0.16	0.22	0.15
Total Growth Rate, %													
81-04	64.5	17.7	51.4	30.8	62.1	35.5	166.6	78.0	30.6	83.3	23.2	144.3	63.7

Source: Table 3 and CANSIM II, v687341, v687375, v687409, v687443, v687477, v687511, v687545, v687579, v687613, v687647 and v687681.

Note: 1 Includes all sectors of funders and all sectors of performers and includes the natural sciences and engineering, social sciences and humanities .

2 Not includes Gatineau and other cities in the National Capital Region.

3 Not includes Ottawa and other cities in the National Capital Region.

Table 3b: Distribution of General Expenditures on Research and Development (GERD) by Province,¹ 1979-2004

	(in per cent)														
	Canada	Atlantic Canada					Total	Que. ²	Ont. ³	NCR ⁴	Western Canada				Total
	Nfld.	P.E.I.	N.S.	N.B.						Man.	Sask.	Alta.	B.C.		
1979	100.0	0.8	0.2	2.6	2.0	5.6	19.2	35.9	9.0	2.8	2.2	9.1	5.5	19.5	
1980	100.0	0.8	0.1	2.3	1.0	4.2	18.7	36.7	8.7	3.3	2.3	9.8	5.8	21.1	
1981	100.0	0.9	0.2	2.1	0.8	3.9	18.6	37.8	8.3	3.1	1.9	10.7	6.0	21.7	
1982	100.0	0.9	0.1	2.1	0.9	4.0	18.4	39.2	7.7	3.1	2.3	10.0	5.8	21.2	
1983	100.0	1.3	0.1	2.6	0.8	4.8	18.0	40.5	7.3	3.4	2.2	8.4	6.0	20.1	
1984	100.0	0.9	0.2	2.6	0.8	4.4	19.8	39.6	8.1	3.3	2.2	8.1	6.1	19.6	
1985	100.0	1.0	0.1	2.4	1.3	4.8	22.8	44.5	6.4	2.9	2.5	8.9	7.0	21.2	
1986	100.0	0.8	0.3	2.4	1.1	4.6	22.0	45.9	7.1	2.6	2.3	8.4	7.0	20.4	
1987	100.0	0.9	0.2	2.1	1.1	4.3	23.7	46.4	7.8	2.4	2.1	7.3	6.1	17.8	
1988	100.0	1.0	0.1	3.0	1.7	5.8	23.1	44.9	7.4	2.6	1.9	7.3	6.8	18.6	
1989	100.0	1.0	0.2	2.5	1.7	5.4	24.3	44.4	7.0	2.6	2.0	7.2	7.0	18.9	
1990	100.0	1.0	0.2	2.3	1.3	4.8	25.3	43.3	6.9	2.6	2.0	7.6	7.5	19.7	
1991	100.0	1.0	0.1	2.2	1.1	4.5	26.6	42.9	6.8	2.6	2.0	7.3	7.3	19.2	
1992	100.0	1.0	0.1	2.1	1.1	4.2	27.5	42.5	6.6	2.5	2.1	6.9	7.8	19.2	
1993	100.0	0.9	0.1	2.0	1.1	4.1	27.0	43.8	6.4	2.4	1.9	6.8	7.5	18.7	
1994	100.0	0.8	0.1	2.0	1.0	3.9	26.2	44.5	5.9	2.3	1.8	7.2	8.0	19.4	
1995	100.0	0.7	0.1	1.9	1.0	3.8	26.8	44.7	5.9	2.1	1.8	7.1	7.8	18.8	
1996	100.0	0.7	0.1	1.9	1.1	3.8	27.5	44.7	5.6	2.1	1.7	7.3	7.3	18.4	
1997	100.0	0.7	0.1	1.8	0.9	3.4	26.9	46.4	5.2	1.8	2.0	7.2	7.1	18.1	
1998	100.0	0.7	0.1	1.9	1.0	3.8	26.9	46.4	5.0	1.9	1.7	7.4	6.9	17.9	
1999	100.0	0.7	0.1	1.9	0.9	3.7	27.7	46.0	4.6	2.2	1.8	6.6	7.3	17.9	
2000	100.0	0.7	0.2	1.8	0.8	3.4	27.6	46.5	4.3	2.0	1.8	6.5	7.9	18.2	
2001	100.0	0.6	0.2	1.6	0.7	3.1	27.5	47.0	4.0	2.1	1.7	6.9	7.6	18.3	
2002	100.0	0.6	0.1	1.7	0.9	3.4	28.3	44.5	4.3	2.0	1.8	7.3	8.3	19.5	
2003	100.0	0.7	0.2	1.7	0.9	3.4	28.3	44.7	4.1	1.9	1.6	7.5	8.4	19.4	
2004	100.0	0.6	0.2	1.7	0.9	3.4	27.5	45.1	3.7	2.0	1.6	7.9	8.8	20.3	
		Average Annual Growth Rate, %													
81-89	n.a	2.40	0.74	2.28	9.18	4.02	3.41	2.04	-2.12	-1.97	0.39	-4.78	1.97	-1.74	
89-00	n.a	-3.91	0.36	-3.01	-6.77	-4.09	1.15	0.42	-4.25	-2.44	-0.76	-0.94	1.00	-0.33	
81-04	n.a	-1.21	-0.13	-0.80	0.08	-0.65	1.72	0.77	-3.44	-1.87	-0.74	-1.30	1.65	-0.29	
00-04	n.a	-0.78	-3.16	-0.70	2.21	-0.14	-0.05	-0.76	-3.85	-0.08	-2.92	5.00	2.82	2.79	
79-04	n.a	-0.77	-0.26	-1.59	-3.42	-1.97	1.46	0.92	-3.52	-1.38	-1.15	-0.57	1.92	0.15	
		Total Growth Rate, %													
79-04	0.0	-17.6	-6.3	-33.1	-58.1	-39.3	43.5	25.6	-59.1	-29.4	-25.2	-13.2	60.9	3.8	

Source: Table 3.

Note: 1 Includes all sectors of funders and all sectors of performers and includes the natural sciences and engineering, social sciences and humanities .

2 Not includes Gatineau and other cities in the National Capital Region.

3 Not includes Ottawa and other cities in the National Capital Region.

4 National Capital Region.

Table 4: Gross Domestic Expenditures on Business Enterprise Research and Development by Province,¹ 1979-2004

	Canada	Atlantic Canada					Que. ²	Ont. ³	Western Canada				Total
		Nfld.	P.E.I.	N.S.	N.B.	Total			Man.	Sask.	Alta.	B.C.	
1979	1,266	2	1	5	33	41	314	671	13	15	142	57	227
1980	1,571	3	1	5	3	12	370	856	34	17	195	70	316
1981	2,124	9	1	9	5	24	480	1,135	28	24	280	119	451
1982	2,489	2	0	12	5	19	574	1,409	28	42	270	130	470
1983	2,602	4	0	14	6	24	588	1,564	27	37	208	141	413
1984	3,022	5	1	16	13	35	729	1,745	31	44	245	175	495
1985	3,635	6	1	23	30	60	868	2,121	27	54	271	226	578
1986	4,022	5	11	28	25	69	945	2,395	30	56	259	265	610
1987	4,341	7	3	25	28	63	1,108	2,628	31	49	226	235	541
1988	4,623	9	2	61	77	149	1,161	2,702	36	40	256	268	600
1989	4,779	10	2	38	80	130	1,245	2,729	44	43	286	295	668
1990	5,169	10	2	30	46	88	1,415	2,842	49	47	357	367	820
1991	5,355	10	2	26	30	68	1,520	2,952	64	54	349	348	815
1992	5,742	10	1	33	29	73	1,644	3,123	72	66	337	427	902
1993	6,424	11	2	44	41	98	1,802	3,507	90	60	396	471	1,017
1994	7,567	12	2	61	49	124	2,056	4,112	102	70	509	591	1,272
1995	7,991	11	3	64	52	130	2,277	4,320	96	74	491	602	1,263
1996	7,997	17	3	54	59	133	2,394	4,257	93	58	524	538	1,213
1997	8,739	14	2	54	35	105	2,519	4,833	89	82	546	564	1,281
1998	9,682	17	3	62	39	121	2,764	5,394	102	74	618	608	1,402
1999	10,400	18	3	62	39	122	3,047	5,799	148	78	490	714	1,430
2000	12,395	20	5	67	40	132	3,642	6,856	133	76	583	973	1,765
2001	14,272	21	6	91	45	163	4,158	7,900	173	87	710	1,080	2,050
2002	13,516	21	4	95	64	184	4,131	7,064	150	112	782	1,092	2,136
2003	13,704	26	7	77	62	172	4,154	7,241	136	84	790	1,127	2,137
2004	14,441	26	6	89	75	196	4,308	7,457	165	111	892	1,309	2,477
		Average Annual Growth Rate, %											
81-89	10.67	1.33	9.05	19.73	41.42	23.51	12.65	11.59	5.81	7.56	0.27	12.02	5.03
89-00	9.05	6.50	8.69	5.29	-6.11	0.14	10.25	8.74	10.58	5.31	6.69	11.46	9.23
81-04	8.69	4.72	8.10	10.48	12.50	9.56	10.01	8.53	8.02	6.89	5.17	10.99	7.69
00-04	3.89	6.78	4.66	7.36	17.02	10.39	4.29	2.12	5.54	9.93	11.22	7.70	8.84
79-04	10.23	10.80	7.43	12.21	3.34	6.46	11.04	10.11	10.70	8.34	7.63	13.36	10.03
		Total Growth Rate, %											
79-04	1040.7	1200.0	500.0	1680.0	127.3	378.0	1272.0	1011.3	1169.2	640.0	528.2	2196.5	991.2

Source: CANSIM II series: v617624, v13682159, v13682191, v13682223, v13682255, v13682287, v13682319, v13682351, v13682383, v13682415 and v13682447.

Note: 1 Includes all sectors of funders and business enterprise performers, and includes the natural sciences and engineering, social sciences and humanities

Table 4a: Business Enterprise Expenditures on Research and Development as a Proportion of Gross Domestic Product by Province,¹ 1979-2004

	(in percent)												
	Canada	Atlantic Canada					Que. ²	Ont. ³	Western Canada				Total
		Nfld.	P.E.I.	N.S.	N.B.	Total			Man.	Sask.	Alta.	B.C.	
1981	0.59	0.17	0.09	0.11	0.08	0.12	0.60	0.87	0.21	0.16	0.52	0.27	0.36
1982	0.66	0.04	0.00	0.13	0.07	0.08	0.67	1.02	0.20	0.28	0.48	0.29	0.36
1983	0.63	0.07	0.00	0.14	0.07	0.09	0.64	1.01	0.18	0.23	0.36	0.30	0.30
1984	0.67	0.08	0.07	0.14	0.15	0.12	0.73	1.01	0.18	0.26	0.39	0.35	0.34
1985	0.75	0.09	0.07	0.19	0.32	0.20	0.81	1.12	0.15	0.30	0.41	0.42	0.37
1986	0.78	0.07	0.67	0.21	0.24	0.21	0.81	1.15	0.16	0.32	0.45	0.47	0.40
1987	0.78	0.09	0.17	0.17	0.24	0.18	0.86	1.14	0.15	0.27	0.38	0.38	0.34
1988	0.75	0.11	0.10	0.40	0.62	0.39	0.82	1.05	0.16	0.21	0.40	0.39	0.34
1989	0.73	0.11	0.10	0.23	0.61	0.32	0.84	0.98	0.19	0.22	0.42	0.39	0.36
1990	0.76	0.11	0.09	0.18	0.34	0.21	0.92	1.00	0.20	0.22	0.49	0.46	0.41
1991	0.78	0.10	0.09	0.15	0.22	0.16	0.98	1.04	0.27	0.25	0.48	0.43	0.41
1992	0.82	0.10	0.04	0.18	0.21	0.17	1.04	1.09	0.29	0.31	0.45	0.49	0.43
1993	0.88	0.11	0.08	0.24	0.28	0.22	1.11	1.20	0.37	0.26	0.49	0.50	0.46
1994	0.98	0.12	0.08	0.33	0.32	0.27	1.21	1.32	0.39	0.29	0.58	0.59	0.53
1995	0.99	0.10	0.11	0.33	0.32	0.27	1.28	1.31	0.36	0.28	0.53	0.57	0.50
1996	0.96	0.16	0.11	0.28	0.35	0.27	1.33	1.26	0.33	0.20	0.53	0.49	0.46
1997	0.99	0.13	0.07	0.27	0.21	0.21	1.34	1.34	0.30	0.28	0.51	0.49	0.46
1998	1.06	0.15	0.10	0.29	0.22	0.23	1.41	1.43	0.33	0.25	0.58	0.53	0.49
1999	1.06	0.15	0.09	0.27	0.20	0.21	1.45	1.42	0.46	0.25	0.42	0.59	0.48
2000	1.15	0.14	0.15	0.27	0.20	0.21	1.62	1.56	0.39	0.22	0.40	0.74	0.51
2001	1.29	0.15	0.17	0.35	0.22	0.25	1.80	1.74	0.49	0.26	0.47	0.81	0.58
2002	1.17	0.13	0.11	0.35	0.30	0.27	1.71	1.48	0.41	0.33	0.52	0.79	0.59
2003	1.13	0.14	0.18	0.27	0.28	0.24	1.66	1.47	0.36	0.23	0.46	0.77	0.55
2004	1.12	0.13	0.15	0.30	0.32	0.26	1.64	1.44	0.41	0.28	0.47	0.83	0.58
Percentage Point Change													
81-89	0.14	-0.06	0.00	0.12	0.53	0.20	0.24	0.11	-0.02	0.05	-0.10	0.13	0.00
89-00	0.42	0.03	0.05	0.04	-0.41	-0.11	0.78	0.58	0.20	0.01	-0.02	0.35	0.15
81-04	0.53	-0.04	0.06	0.19	0.24	0.14	1.04	0.57	0.21	0.11	-0.05	0.57	0.23
00-04	-0.03	-0.01	0.00	0.03	0.12	0.04	0.02	-0.11	0.02	0.05	0.07	0.09	0.07
Total Growth Rate, %													
81-04	89.9	-23.5	59.0	164.0	305.3	118.3	174.7	66.4	101.6	70.8	-9.9	213.3	63.2

Source: Table 4 and CANSIM II, v687341, v687375, v687409, v687443, v687477, v687511, v687545, v687579, v687613, v687647 and v687681.

Note: 1 Includes all sectors of funders and business enterprise performers, and includes the natural sciences and engineering, social sciences and humanities .

2 Not includes Gatineau and other cities in the National Capital Region.

3 Not includes Ottawa and other cities in the National Capital Region.

Table 4b: Distribution of Business Enterprise Expenditures on Research and Development by Province,¹ 1979-2004

	(in percent)												
	Canada	Atlantic Canada					Que. ²	Ont. ³	Western Canada				Total
		Nfld.	P.E.I.	N.S.	N.B.	Total			Man.	Sask.	Alta.	B.C.	
1979	100.0	0.2	0.1	0.4	2.6	3.2	24.8	53.0	1.0	1.2	11.2	4.5	17.9
1980	100.0	0.2	0.1	0.3	0.2	0.8	23.6	54.5	2.2	1.1	12.4	4.5	20.1
1981	100.0	0.4	0.0	0.4	0.2	1.1	22.6	53.4	1.3	1.1	13.2	5.6	21.2
1982	100.0	0.1	0.0	0.5	0.2	0.8	23.1	56.6	1.1	1.7	10.8	5.2	18.9
1983	100.0	0.2	0.0	0.5	0.2	0.9	22.6	60.1	1.0	1.4	8.0	5.4	15.9
1984	100.0	0.2	0.0	0.5	0.4	1.2	24.1	57.7	1.0	1.5	8.1	5.8	16.4
1985	100.0	0.2	0.0	0.6	0.8	1.7	23.9	58.3	0.7	1.5	7.5	6.2	15.9
1986	100.0	0.1	0.3	0.7	0.6	1.7	23.5	59.5	0.7	1.4	6.4	6.6	15.2
1987	100.0	0.2	0.1	0.6	0.6	1.5	25.5	60.5	0.7	1.1	5.2	5.4	12.5
1988	100.0	0.2	0.0	1.3	1.7	3.2	25.1	58.4	0.8	0.9	5.5	5.8	13.0
1989	100.0	0.2	0.0	0.8	1.7	2.7	26.1	57.1	0.9	0.9	6.0	6.2	14.0
1990	100.0	0.2	0.0	0.6	0.9	1.7	27.4	55.0	0.9	0.9	6.9	7.1	15.9
1991	100.0	0.2	0.0	0.5	0.6	1.3	28.4	55.1	1.2	1.0	6.5	6.5	15.2
1992	100.0	0.2	0.0	0.6	0.5	1.3	28.6	54.4	1.3	1.1	5.9	7.4	15.7
1993	100.0	0.2	0.0	0.7	0.6	1.5	28.1	54.6	1.4	0.9	6.2	7.3	15.8
1994	100.0	0.2	0.0	0.8	0.6	1.6	27.2	54.3	1.3	0.9	6.7	7.8	16.8
1995	100.0	0.1	0.0	0.8	0.7	1.6	28.5	54.1	1.2	0.9	6.1	7.5	15.8
1996	100.0	0.2	0.0	0.7	0.7	1.7	29.9	53.2	1.2	0.7	6.6	6.7	15.2
1997	100.0	0.2	0.0	0.6	0.4	1.2	28.8	55.3	1.0	0.9	6.2	6.5	14.7
1998	100.0	0.2	0.0	0.6	0.4	1.2	28.5	55.7	1.1	0.8	6.4	6.3	14.5
1999	100.0	0.2	0.0	0.6	0.4	1.2	29.3	55.8	1.4	0.8	4.7	6.9	13.8
2000	100.0	0.2	0.0	0.5	0.3	1.1	29.4	55.3	1.1	0.6	4.7	7.8	14.2
2001	100.0	0.1	0.0	0.6	0.3	1.1	29.1	55.4	1.2	0.6	5.0	7.6	14.4
2002	100.0	0.2	0.0	0.7	0.5	1.4	30.6	52.3	1.1	0.8	5.8	8.1	15.8
2003	100.0	0.2	0.1	0.6	0.5	1.3	30.3	52.8	1.0	0.6	5.8	8.2	15.6
2004	100.0	0.2	0.0	0.6	0.5	1.4	29.8	51.6	1.1	0.8	6.2	9.1	17.2
Percentage Point Change													
81-89	n.a	-0.21	-0.01	0.37	1.44	1.59	3.45	3.67	-0.40	-0.23	-7.20	0.57	-7.26
89-00	n.a	-0.05	0.00	-0.25	-1.35	-1.66	3.33	-1.79	0.15	-0.29	-1.28	1.68	0.26
81-04	n.a	-0.24	-0.01	0.19	0.28	0.23	7.23	-1.80	-0.18	-0.36	-7.01	3.46	-4.08
00-04	n.a	0.02	0.00	0.08	0.20	0.29	0.45	-3.67	0.07	0.16	1.47	1.21	2.91
79-04	n.a	0.02	-0.04	0.22	-2.09	-1.88	5.03	-1.36	0.12	-0.42	-5.04	4.56	-0.78
Total Growth Rate, %													
79-04	n.a	-57.5	-11.8	45.4	120.6	20.1	32.0	-3.4	-13.3	-32.0	-53.1	61.8	-19.2

Source: Table 4.

Note: 1 Includes all sectors of funders and business enterprise performers, and includes the natural sciences and engineering, social sciences and humanities .

2 Not includes Gatineau and other cities in the National Capital Region.

3 Not includes Ottawa and other cities in the National Capital Region.

Table 5: General Expenditures on Research and Development (GERD) by Province, by Performer,¹ 2004
(millions of current \$)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector
		Total	Federal	Provincial (except PROS) ²	PROS ²			
Atlantic Canada	877	155	140	13	2	196	520	6
Newfoundland	169	28	23	5	0	26	115	0
Prince Edward Island	40	10	10	0	0	6	24	0
Nova Scotia	446	87	81	6	0	89	267	3
New Brunswick	222	30	26	2	2	75	114	3
Quebec ³	7,161	403	321	68	14	4,308	2,447	4
Ontario ⁴	11,720	415	329	86	0	7,457	3,836	12
West	5,276	472	328	134	9	2,477	2,233	94
Manitoba	519	78	73	4	0	165	261	16
Saskatchewan	422	67	54	4	9	111	244	0
Alberta	2,053	223	110	113	0	892	898	39
British Columbia	2,282	104	91	13	0	1,309	830	39
Canada	26,003	2,409	2,083	301	25	14,441	9,037	116
(percentage distribution within a province)								
Atlantic Canada	100.0	17.7	16.0	1.5	0.2	22.3	59.3	0.7
Newfoundland	100.0	16.6	13.6	3.0	0.0	15.4	68.0	0.0
Prince Edward Island	100.0	25.0	25.0	0.0	0.0	15.0	60.0	0.0
Nova Scotia	100.0	19.5	18.2	1.3	0.0	20.0	59.9	0.7
New Brunswick	100.0	13.5	11.7	0.9	0.9	33.8	51.4	1.4
Quebec ³	100.0	5.6	4.5	0.9	0.2	60.2	34.2	0.1
Ontario ⁴	100.0	3.5	2.8	0.7	0.0	63.6	32.7	0.1
West	100.0	8.9	6.2	2.5	0.2	46.9	42.3	1.8
Manitoba	100.0	15.0	14.1	0.8	0.0	31.8	50.3	3.1
Saskatchewan	100.0	15.9	12.8	0.9	2.1	26.3	57.8	0.0
Alberta	100.0	10.9	5.4	5.5	0.0	43.4	43.7	1.9
British Columbia	100.0	4.6	4.0	0.6	0.0	57.4	36.4	1.7
Canada	100.0	9.3	8.0	1.2	0.1	55.5	34.8	0.4
(provincial as a share of the national average, per cent)								
Atlantic Canada	3.4	6.4	6.7	4.3	8.0	1.4	5.8	5.2
Newfoundland	0.6	1.2	1.1	1.7	0.0	0.2	1.3	0.0
Prince Edward Island	0.2	0.4	0.5	0.0	0.0	0.0	0.3	0.0
Nova Scotia	1.7	3.6	3.9	2.0	0.0	0.6	3.0	2.6
New Brunswick	0.9	1.2	1.2	0.7	8.0	0.5	1.3	2.6
Quebec ³	27.5	16.7	15.4	22.6	56.0	29.8	27.1	3.4
Ontario ⁴	45.1	17.2	15.8	28.6	0.0	51.6	42.4	10.3
West	20.3	19.6	15.7	44.5	36.0	17.2	24.7	81.0
Manitoba	2.0	3.2	3.5	1.3	0.0	1.1	2.9	13.8
Saskatchewan	1.6	2.8	2.6	1.3	36.0	0.8	2.7	0.0
Alberta	7.9	9.3	5.3	37.5	0.0	6.2	9.9	33.6
British Columbia	8.8	4.3	4.4	4.3	0.0	9.1	9.2	33.6
Canada	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: CANSIM II: Table 358-0001.

Note:1 Includes all funders and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

3. Not includes Gatineau and other cities in the National Capital Region.

4. Not includes Ottawa and other cities in the National Capital Region.

Table 6: General Expenditures on Research and Development (GERD) by Province, by Funder,¹ 2004
(millions of current \$)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector	Foreign Sector
		Total	Federal	Provincial (except PROS) ²	PROS ²				
Atlantic Canada	877	324	294	30	0	196	286	33	39
Newfoundland	169	67	60	7	0	33	60	3	6
Prince Edward Island	40	20	19	1	0	5	15	0	0
Nova Scotia	446	172	157	15	0	79	141	25	30
New Brunswick	222	65	58	7	0	79	70	5	3
Quebec ³	7,161	1,493	1,057	436	0	3,889	1,109	172	499
Ontario ⁴	11,720	1,816	1,327	489	0	6,515	1,792	286	1,311
West	5,276	1,488	1,037	451	0	2,126	939	237	484
Manitoba	519	176	148	28	0	167	123	37	15
Saskatchewan	422	159	123	36	0	120	122	12	8
Alberta	2,053	664	339	325	0	903	347	63	76
British Columbia	2,282	489	427	62	0	936	347	125	385
Canada	26,003	6,073	4,666	1,407	0	12,743	4,126	729	2,332
(percentage distribution within a province)									
Atlantic Canada	100.0	36.9	33.5	3.4	0.0	22.3	32.6	3.8	4.4
Newfoundland	100.0	39.6	35.5	4.1	0.0	19.5	35.5	1.8	3.6
Prince Edward Island	100.0	50.0	47.5	2.5	0.0	12.5	37.5	0.0	0.0
Nova Scotia	100.0	38.6	35.2	3.4	0.0	17.7	31.6	5.6	6.7
New Brunswick	100.0	29.3	26.1	3.2	0.0	35.6	31.5	2.3	1.4
Quebec ³	100.0	20.8	14.8	6.1	0.0	54.3	15.5	2.4	7.0
Ontario ⁴	100.0	15.5	11.3	4.2	0.0	55.6	15.3	2.4	11.2
West	100.0	28.2	19.7	8.5	0.0	40.3	17.8	4.5	9.2
Manitoba	100.0	33.9	28.5	5.4	0.0	32.2	23.7	7.1	2.9
Saskatchewan	100.0	37.7	29.1	8.5	0.0	28.4	28.9	2.8	1.9
Alberta	100.0	32.3	16.5	15.8	0.0	44.0	16.9	3.1	3.7
British Columbia	100.0	21.4	18.7	2.7	0.0	41.0	15.2	5.5	16.9
Canada	100.0	23.4	17.9	5.4	0.0	49.0	15.9	2.8	9.0
(provincial as a share of the national average, per cent)									
Atlantic Canada	3.4	5.3	6.3	2.1	n.a	1.5	6.9	4.5	1.7
Newfoundland	0.6	1.1	1.3	0.5	n.a	0.3	1.5	0.4	0.3
Prince Edward Island	0.2	0.3	0.4	0.1	n.a	0.0	0.4	0.0	0.0
Nova Scotia	1.7	2.8	3.4	1.1	n.a	0.6	3.4	3.4	1.3
New Brunswick	0.9	1.1	1.2	0.5	n.a	0.6	1.7	0.7	0.1
Quebec ³	27.5	24.6	22.7	31.0	n.a	30.5	26.9	23.6	21.4
Ontario ⁴	45.1	29.9	28.4	34.8	n.a	51.1	43.4	39.2	56.2
West	20.3	24.5	22.2	32.1	n.a	16.7	22.8	32.5	20.8
Manitoba	2.0	2.9	3.2	2.0	n.a	1.3	3.0	5.1	0.6
Saskatchewan	1.6	2.6	2.6	2.6	n.a	0.9	3.0	1.6	0.3
Alberta	7.9	10.9	7.3	23.1	n.a	7.1	8.4	8.6	3.3
British Columbia	8.8	8.1	9.2	4.4	n.a	7.3	8.4	17.1	16.5
Canada	100.0	100.0	100.0	100.0	n.a	100.0	100.0	100.0	100.0

Source: CANSIM II: Table 358-0001.

Note:1 Includes all performers and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

3. Not includes Gatineau and other cities in the National Capital Region.

4. Not includes Ottawa and other cities in the National Capital Region.

Table 7: General Expenditures on Research and Development by Performer in Ontario,¹ 1979-2004

(millions of current \$)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector
		Total	Federal	Provincial (except PROS)	PROS ²			
1979	1,092	171	134	29	8	671	231	19
1980	1,312	174	131	33	10	856	261	21
1981	1,667	209	158	37	14	1,135	300	23
1982	2,040	257	197	48	12	1,409	349	25
1983	2,237	260	206	43	11	1,564	382	31
1984	2,483	259	196	48	15	1,745	444	35
1985	3,109	283	217	49	17	2,121	661	44
1986	3,465	317	248	58	11	2,395	708	45
1987	3,687	268	200	56	12	2,628	745	46
1988	4,059	252	181	58	13	2,702	1,045	60
1989	4,224	320	230	77	14	2,729	1,109	65
1990	4,444	350	249	86	15	2,842	1,176	76
1991	4,616	376	251	111	14	2,952	1,211	77
1992	4,818	372	274	84	14	3,123	1,281	42
1993	5,331	359	276	69	14	3,507	1,423	42
1994	5,940	339	253	76	11	4,112	1,441	47
1995	6,148	343	259	76	9	4,320	1,433	51
1996	6,176	414	348	57	10	4,257	1,456	48
1997	6,787	359	302	47	9	4,833	1,554	42
1998	7,465	327	276	51	0	5,394	1,700	44
1999	8,115	385	322	63	0	5,799	1,908	23
2000	9,564	385	314	71	0	6,856	2,317	6
2001	10,887	404	328	76	0	7,900	2,575	8
2002	10,468	400	324	76	0	7,064	2,995	9
2003	10,878	437	351	87	0	7,241	3,187	12
2004	11,720	415	329	86	0	7,457	3,836	12
Average Annual Growth Rates, %								
81-89	12.32	5.47	4.81	9.59	0.00	11.59	17.75	13.87
89-00	7.71	1.70	2.87	-0.73	n.a	8.74	6.93	-19.48
81-04	8.85	3.03	3.24	3.74	n.a	8.53	11.72	-2.79
00-04	5.21	1.89	1.17	4.91	n.a	2.12	13.43	18.92
79-04	9.96	3.61	3.66	4.44	n.a	10.11	11.89	-1.82

Source: CANSIM II: v13682309,v13682317,v13682311,v13682313,v13682315, v13682319,v13682321,v13682323.

Note:1 Includes all funders and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

Table 7a: General Expenditures on Research and Development as a Proportion of Gross Domestic Product by Performer in Ontario,¹ 1981-2004

(in per cent)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector
		Total	Federal	Provincial (except PROS)	PROS ²			
1981	1.27	0.16	0.12	0.03	0.01	0.87	0.23	0.02
1982	1.47	0.19	0.14	0.03	0.01	1.02	0.25	0.02
1983	1.45	0.17	0.13	0.03	0.01	1.01	0.25	0.02
1984	1.44	0.15	0.11	0.03	0.01	1.01	0.26	0.02
1985	1.64	0.15	0.11	0.03	0.01	1.12	0.35	0.02
1986	1.66	0.15	0.12	0.03	0.01	1.15	0.34	0.02
1987	1.60	0.12	0.09	0.02	0.01	1.14	0.32	0.02
1988	1.58	0.10	0.07	0.02	0.01	1.05	0.41	0.02
1989	1.52	0.11	0.08	0.03	0.01	0.98	0.40	0.02
1990	1.57	0.12	0.09	0.03	0.01	1.00	0.42	0.03
1991	1.63	0.13	0.09	0.04	0.00	1.04	0.43	0.03
1992	1.68	0.13	0.10	0.03	0.00	1.09	0.45	0.01
1993	1.82	0.12	0.09	0.02	0.00	1.20	0.48	0.01
1994	1.91	0.11	0.08	0.02	0.00	1.32	0.46	0.02
1995	1.87	0.10	0.08	0.02	0.00	1.31	0.44	0.02
1996	1.83	0.12	0.10	0.02	0.00	1.26	0.43	0.01
1997	1.89	0.10	0.08	0.01	0.00	1.34	0.43	0.01
1998	1.98	0.09	0.07	0.01	0.00	1.43	0.45	0.01
1999	1.98	0.09	0.08	0.02	0.00	1.42	0.47	0.01
2000	2.17	0.09	0.07	0.02	0.00	1.56	0.53	0.00
2001	2.40	0.09	0.07	0.02	0.00	1.74	0.57	0.00
2002	2.19	0.08	0.07	0.02	0.00	1.48	0.63	0.00
2003	2.21	0.09	0.07	0.02	0.00	1.47	0.65	0.00
2004	2.26	0.08	0.06	0.02	0.00	1.44	0.74	0.00
Average Annual Growth Rates, %								
81-89	2.21	-4.03	-4.63	-0.27	-9.00	1.54	7.15	3.62
89-00	3.32	-2.45	-1.32	-4.78	n.a	4.30	2.57	-22.76
81-04	2.54	-2.95	-2.74	-2.28	n.a	2.24	5.24	-8.42
00-04	1.07	-2.12	-2.81	0.78	n.a	-1.90	8.97	14.24

Source: Table 7 and GDP data from CANSIM II: v687545.

Note: 1 Includes all funders and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

Table 7b: Distribution of General Expenditures on Research and Development by Performer in Ontario,¹ 1979-2004

(per cent)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector
		Total	Federal	Provincial (except PROS)	PROS ²			
1979	100.0	15.7	12.3	2.7	0.7	61.4	21.2	1.7
1980	100.0	13.3	10.0	2.5	0.8	65.2	19.9	1.6
1981	100.0	12.5	9.5	2.2	0.8	68.1	18.0	1.4
1982	100.0	12.6	9.7	2.4	0.6	69.1	17.1	1.2
1983	100.0	11.6	9.2	1.9	0.5	69.9	17.1	1.4
1984	100.0	10.4	7.9	1.9	0.6	70.3	17.9	1.4
1985	100.0	9.1	7.0	1.6	0.5	68.2	21.3	1.4
1986	100.0	9.1	7.2	1.7	0.3	69.1	20.4	1.3
1987	100.0	7.3	5.4	1.5	0.3	71.3	20.2	1.2
1988	100.0	6.2	4.5	1.4	0.3	66.6	25.7	1.5
1989	100.0	7.6	5.4	1.8	0.3	64.6	26.3	1.5
1990	100.0	7.9	5.6	1.9	0.3	64.0	26.5	1.7
1991	100.0	8.1	5.4	2.4	0.3	64.0	26.2	1.7
1992	100.0	7.7	5.7	1.7	0.3	64.8	26.6	0.9
1993	100.0	6.7	5.2	1.3	0.3	65.8	26.7	0.8
1994	100.0	5.7	4.3	1.3	0.2	69.2	24.3	0.8
1995	100.0	5.6	4.2	1.2	0.1	70.3	23.3	0.8
1996	100.0	6.7	5.6	0.9	0.2	68.9	23.6	0.8
1997	100.0	5.3	4.4	0.7	0.1	71.2	22.9	0.6
1998	100.0	4.4	3.7	0.7	0.0	72.3	22.8	0.6
1999	100.0	4.7	4.0	0.8	0.0	71.5	23.5	0.3
2000	100.0	4.0	3.3	0.7	0.0	71.7	24.2	0.1
2001	100.0	3.7	3.0	0.7	0.0	72.6	23.7	0.1
2002	100.0	3.8	3.1	0.7	0.0	67.5	28.6	0.1
2003	100.0	4.0	3.2	0.8	0.0	66.6	29.3	0.1
2004	100.0	3.5	2.8	0.7	0.0	63.6	32.7	0.1
Percentage Percent Changes								
81-89	0.00	-6.10	-6.69	-2.43	-10.97	-0.65	4.83	1.37
89-00	0.00	-5.59	-4.50	-7.84	n.a	0.95	-0.73	-25.24
81-04	0.00	-5.35	-5.15	-4.70	n.a	-0.29	2.63	-10.69
00-04	0.00	-3.16	-3.84	-0.29	n.a	-2.94	7.81	13.03
79-04	0.00	-5.77	-5.73	-5.01	n.a	0.14	1.76	-10.71

Source: Table 7.

Note: 1 Includes all funders and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

Table 8: General Expenditures on Research and Development by Funder in Ontario,¹ 1979-2004

(millions of current \$)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector	Foreign Sector
		Total	Federal	Provincial (except PROS)	PROS ²				
1979	1,092	330	272	57	1	595	87	33	47
1980	1,312	374	308	64	2	762	87	37	52
1981	1,667	475	391	80	4	949	85	41	117
1982	2,040	572	465	106	1	1,102	124	38	204
1983	2,237	609	514	95	0	1,106	118	50	354
1984	2,483	645	545	98	2	1,207	153	52	426
1985	3,109	732	620	109	3	1,558	316	71	432
1986	3,465	804	659	145	0	1,779	344	78	460
1987	3,687	773	635	138	0	1,881	358	87	588
1988	4,059	801	635	165	0	1,881	584	111	683
1989	4,224	919	709	212	0	1,919	633	92	659
1990	4,444	966	730	236	0	1,996	629	111	742
1991	4,616	1,007	746	261	0	2,065	646	122	776
1992	4,818	1,100	848	240	0	2,181	684	95	770
1993	5,331	1,111	849	251	0	2,487	731	132	881
1994	5,940	1,052	799	253	0	2,880	730	146	1,132
1995	6,148	985	756	229	0	3,086	739	142	1,196
1996	6,176	938	719	220	0	3,108	711	181	1,237
1997	6,787	976	741	235	0	3,574	762	194	1,281
1998	7,465	947	737	210	0	3,591	864	195	1,868
1999	8,115	1,135	868	267	0	3,852	957	177	1,994
2000	9,564	1,218	899	319	0	4,260	1,100	206	2,780
2001	10,887	1,503	1,126	377	0	5,907	1,151	216	2,110
2002	10,468	1,517	1,118	398	0	6,154	1,416	242	1,139
2003	10,878	1,747	1,290	457	0	6,182	1,423	247	1,280
2004	11,720	1,816	1,327	489	0	6,515	1,792	286	1,311
Average Annual Growth Rates, %									
81-89	12.32	8.60	7.72	12.96	n.a	9.20	28.53	10.63	24.12
89-00	7.71	2.59	2.18	3.78	n.a	7.52	5.15	7.60	13.98
81-04	8.85	6.00	5.46	8.19	n.a	8.74	14.17	8.81	11.08
00-04	5.21	10.50	10.22	11.27	n.a	11.21	12.98	8.55	-17.13
79-04	9.96	7.06	6.54	8.98	n.a	10.05	12.86	9.02	14.24

Source: CANSIM II: V13682309, V13682331, V13682325, V13682327, V13682329, V13682333, V13682335, V13682337, V13682339.

Note: 1 Includes all performers and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

Table 8a: General Expenditures on Research and Development as a Proportion of Gross Domestic Product by Funder in Ontario,¹ 1981-2004

(in per cent)

	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector	Foreign Sector
		Total	Federal	Provincial (except	PROS ²				
1981	1.27	0.36	0.30	0.06	0.00	0.72	0.06	0.03	0.09
1982	1.47	0.41	0.34	0.08	0.00	0.79	0.09	0.03	0.15
1983	1.45	0.39	0.33	0.06	0.00	0.72	0.08	0.03	0.23
1984	1.44	0.37	0.32	0.06	0.00	0.70	0.09	0.03	0.25
1985	1.64	0.39	0.33	0.06	0.00	0.82	0.17	0.04	0.23
1986	1.66	0.39	0.32	0.07	0.00	0.85	0.17	0.04	0.22
1987	1.60	0.33	0.28	0.06	0.00	0.82	0.16	0.04	0.25
1988	1.58	0.31	0.25	0.06	0.00	0.73	0.23	0.04	0.27
1989	1.52	0.33	0.25	0.08	0.00	0.69	0.23	0.03	0.24
1990	1.57	0.34	0.26	0.08	0.00	0.71	0.22	0.04	0.26
1991	1.63	0.36	0.26	0.09	0.00	0.73	0.23	0.04	0.27
1992	1.68	0.38	0.30	0.08	0.00	0.76	0.24	0.03	0.27
1993	1.82	0.38	0.29	0.09	0.00	0.85	0.25	0.04	0.30
1994	1.91	0.34	0.26	0.08	0.00	0.93	0.23	0.05	0.36
1995	1.87	0.30	0.23	0.07	0.00	0.94	0.22	0.04	0.36
1996	1.83	0.28	0.21	0.07	0.00	0.92	0.21	0.05	0.37
1997	1.89	0.27	0.21	0.07	0.00	0.99	0.21	0.05	0.36
1998	1.98	0.25	0.20	0.06	0.00	0.95	0.23	0.05	0.49
1999	1.98	0.28	0.21	0.07	0.00	0.94	0.23	0.04	0.49
2000	2.17	0.28	0.20	0.07	0.00	0.97	0.25	0.05	0.63
2001	2.40	0.33	0.25	0.08	0.00	1.30	0.25	0.05	0.47
2002	2.19	0.32	0.23	0.08	0.00	1.29	0.30	0.05	0.24
2003	2.21	0.35	0.26	0.09	0.00	1.25	0.29	0.05	0.26
2004	2.26	0.35	0.26	0.09	0.00	1.26	0.35	0.06	0.25
Average Annual Growth Rates, %									
81-89	2.21	-1.18	-1.98	2.79	n.a	-0.63	16.96	0.67	12.94
89-00	3.32	-1.59	-1.99	-0.45	n.a	3.13	0.86	3.21	9.33
81-04	2.54	-0.14	-0.66	1.92	n.a	2.43	7.55	2.50	4.64
00-04	1.07	6.15	5.88	6.89	n.a	6.83	8.53	4.27	-20.40

Source: Table 8 and Table 7a.

Note: 1 Includes all performers and total (natural sciences and engineering, social sciences and humanities) expenditures.

2. PROS refers to provincial research organizations sector.

Table 8b: Distribution of General Expenditures on Research and Development by Funder in Ontario,¹ 1979-2004

(in per cent)

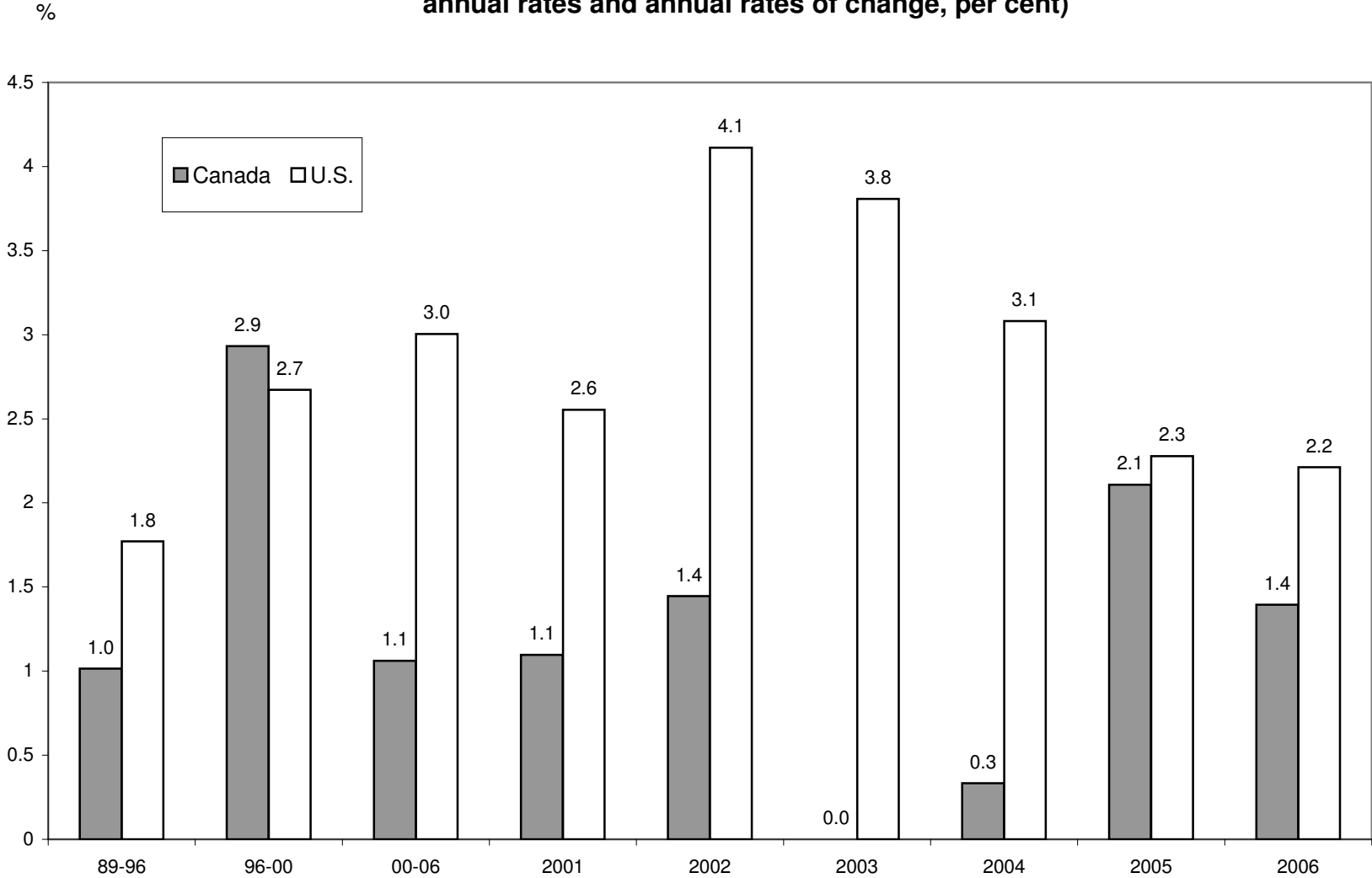
	Total	Government Sector				Business Enterprise Sector	Higher Education Sector	Private Non-Profit Sector	Foreign Sector
		Total	Federal	Provincial (except	PROS ²				
1979	100	30.2	24.9	5.2	0.1	54.5	8.0	3.0	4.3
1980	100	28.5	23.5	4.9	0.2	58.1	6.6	2.8	4.0
1981	100	28.5	23.5	4.8	0.2	56.9	5.1	2.5	7.0
1982	100	28.0	22.8	5.2	0.0	54.0	6.1	1.9	10.0
1983	100	27.2	23.0	4.2	0.0	49.4	5.3	2.2	15.8
1984	100	26.0	21.9	3.9	0.1	48.6	6.2	2.1	17.2
1985	100	23.5	19.9	3.5	0.1	50.1	10.2	2.3	13.9
1986	100	23.2	19.0	4.2	0.0	51.3	9.9	2.3	13.3
1987	100	21.0	17.2	3.7	0.0	51.0	9.7	2.4	15.9
1988	100	19.7	15.6	4.1	0.0	46.3	14.4	2.7	16.8
1989	100	21.8	16.8	5.0	0.0	45.4	15.0	2.2	15.6
1990	100	21.7	16.4	5.3	0.0	44.9	14.2	2.5	16.7
1991	100	21.8	16.2	5.7	0.0	44.7	14.0	2.6	16.8
1992	100	22.8	17.6	5.0	0.0	45.3	14.2	2.0	16.0
1993	100	20.8	15.9	4.7	0.0	46.7	13.7	2.5	16.5
1994	100	17.7	13.5	4.3	0.0	48.5	12.3	2.5	19.1
1995	100	16.0	12.3	3.7	0.0	50.2	12.0	2.3	19.5
1996	100	15.2	11.6	3.6	0.0	50.3	11.5	2.9	20.0
1997	100	14.4	10.9	3.5	0.0	52.7	11.2	2.9	18.9
1998	100	12.7	9.9	2.8	0.0	48.1	11.6	2.6	25.0
1999	100	14.0	10.7	3.3	0.0	47.5	11.8	2.2	24.6
2000	100	12.7	9.4	3.3	0.0	44.5	11.5	2.2	29.1
2001	100	13.8	10.3	3.5	0.0	54.3	10.6	2.0	19.4
2002	100	14.5	10.7	3.8	0.0	58.8	13.5	2.3	10.9
2003	100	16.1	11.9	4.2	0.0	56.8	13.1	2.3	11.8
2004	100	15.5	11.3	4.2	0.0	55.6	15.3	2.4	11.2
Percentage Percent Changes									
81-89	0.00	-3.32	-4.10	0.56	n.a	-2.78	14.43	-1.51	10.50
89-00	0.00	-4.75	-5.13	-3.65	n.a	-0.18	-2.38	-0.10	5.82
81-04	0.00	-2.61	-3.12	-0.61	n.a	-0.10	4.89	-0.03	2.05
00-04	0.00	5.03	4.76	5.76	n.a	5.69	7.38	3.17	-21.24
79-04	0.00	-2.64	-3.10	-0.89	n.a	0.08	2.64	-0.85	3.89

Source: Table 8.

Note:1 Includes all performers and total (natural sciences and engineering, social sciences and humanities) expenditures.

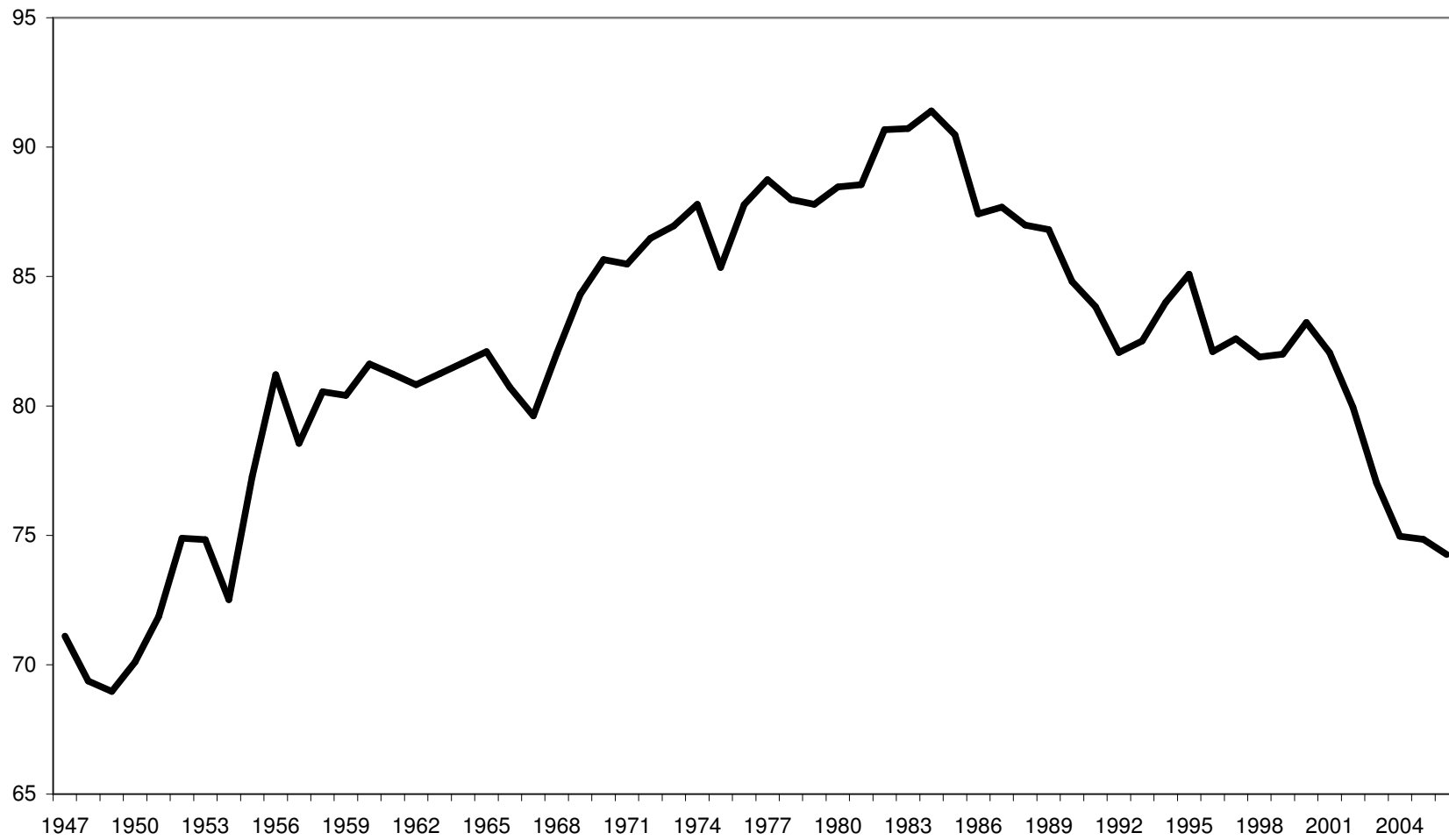
2. PROS refers to provincial research organizations sector.

Chart 1: Business Sector Output per Hour Growth in Canada and the United States (average annual rates and annual rates of change, per cent)



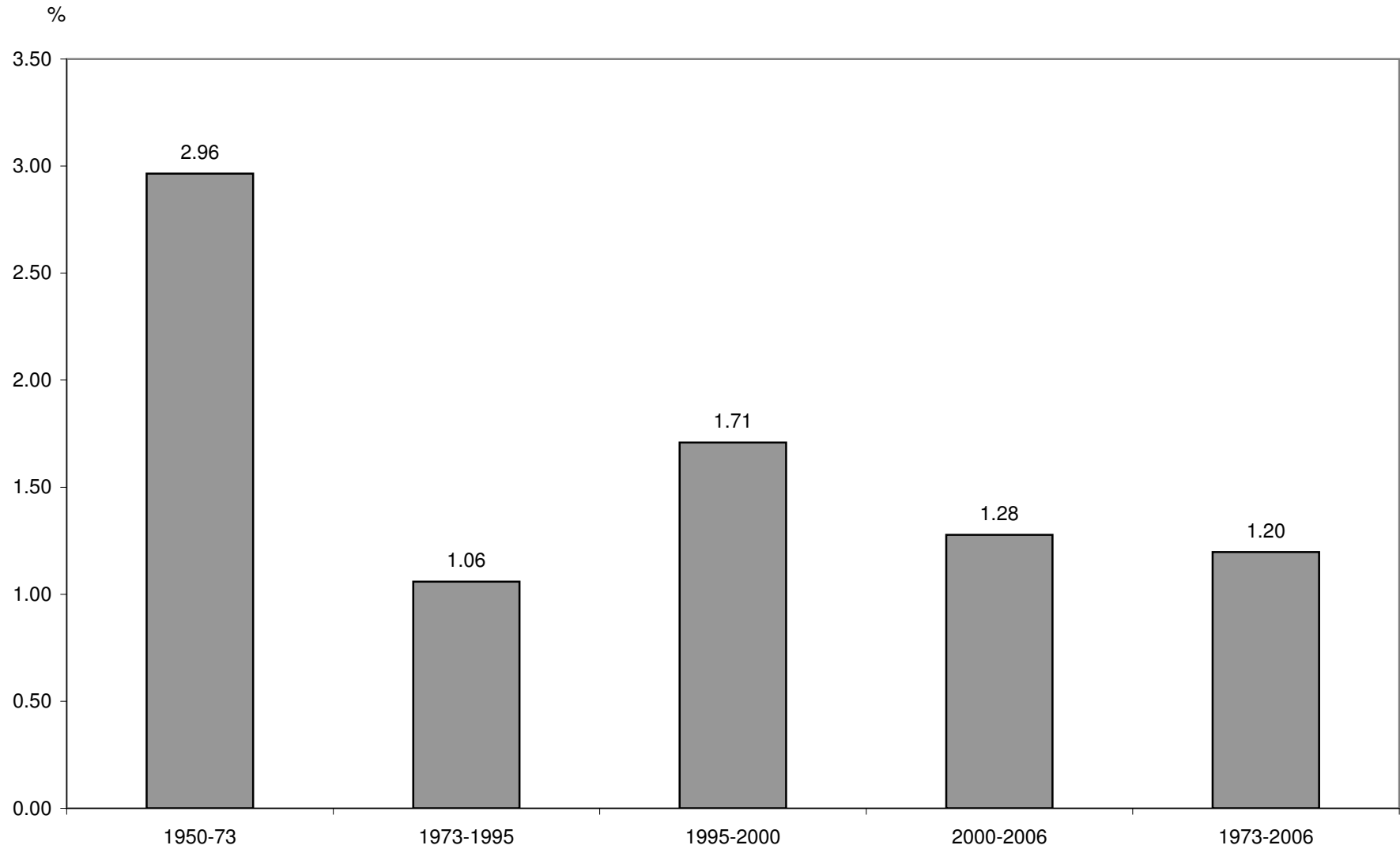
Sources: GDP in chained dollars and total hours worked from the Productivity and Costs Program of the Bureau of Labor Statistics for the United States, and annual averages of quarterly estimates from the Productivity Program Database of Statistics Canada for Canada. Note: Canada's 2006 estimate is for the first three quarters only.

Chart 2: Output per Hour in the Business Sector in Canada as a percentage of the U.S. level, 1947-2006



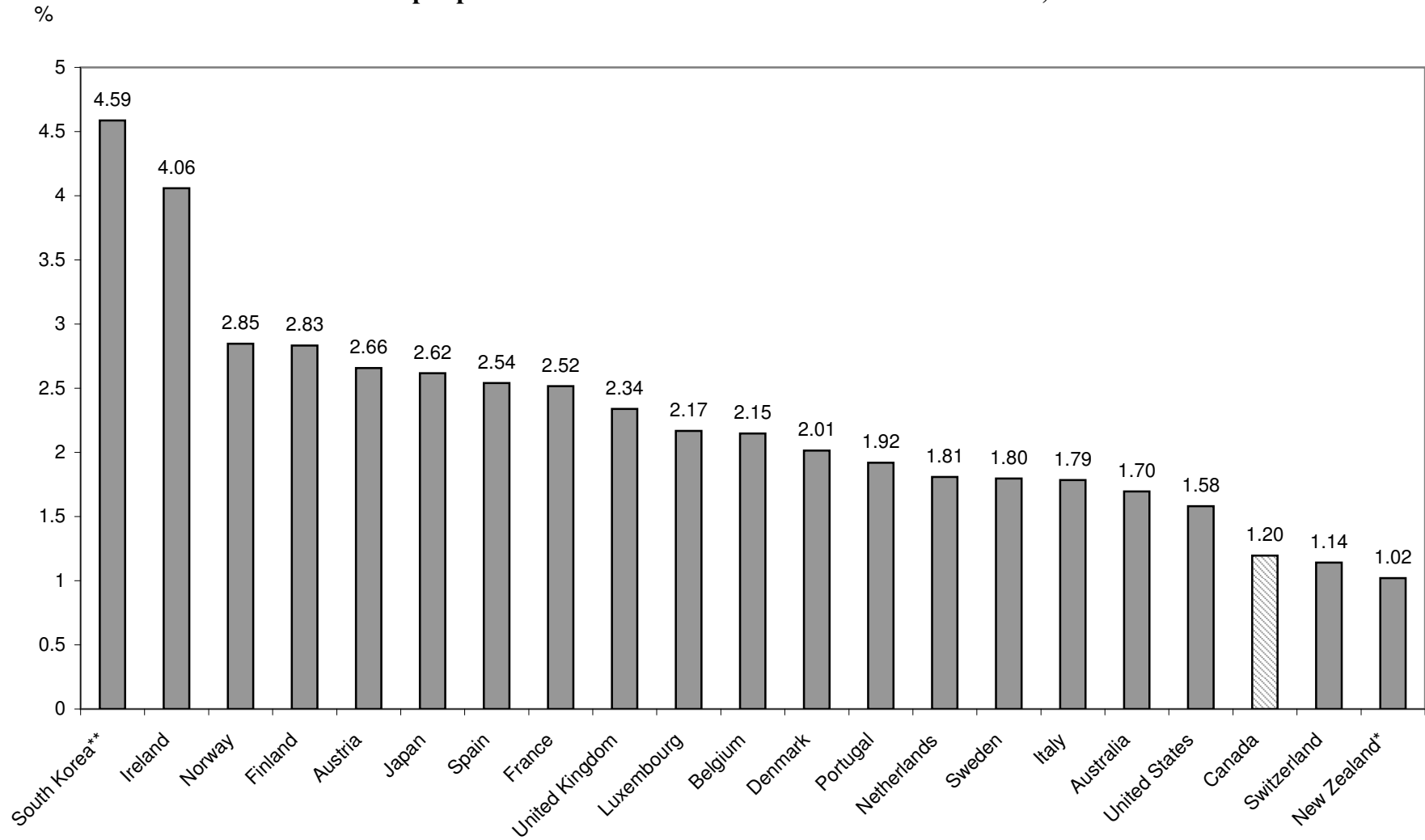
Sources: CSLS Aggregate Income and Productivity Database (<http://www.csls.ca/data/ipt1.asp>)

Chart 3: Canada's Output per Hour Average Annual Growth Rate



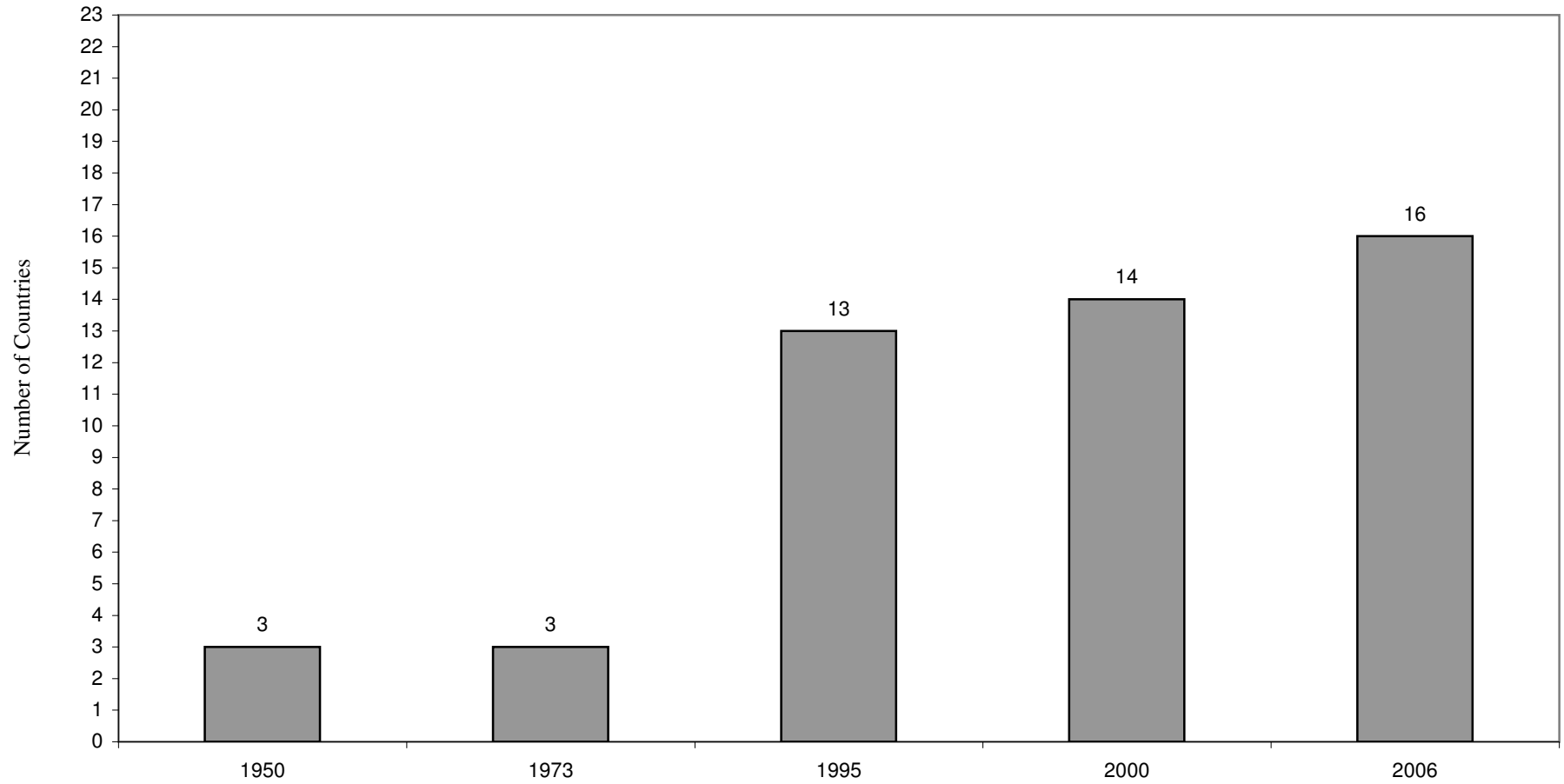
Source: Groningen Growth and Development Centre and the Conference Board, Total Economy Database, February 2007, <http://www.ggdc.net>.

Chart 4: Output per Hour Growth Rates in Selected OECD Countries, 1973-2006



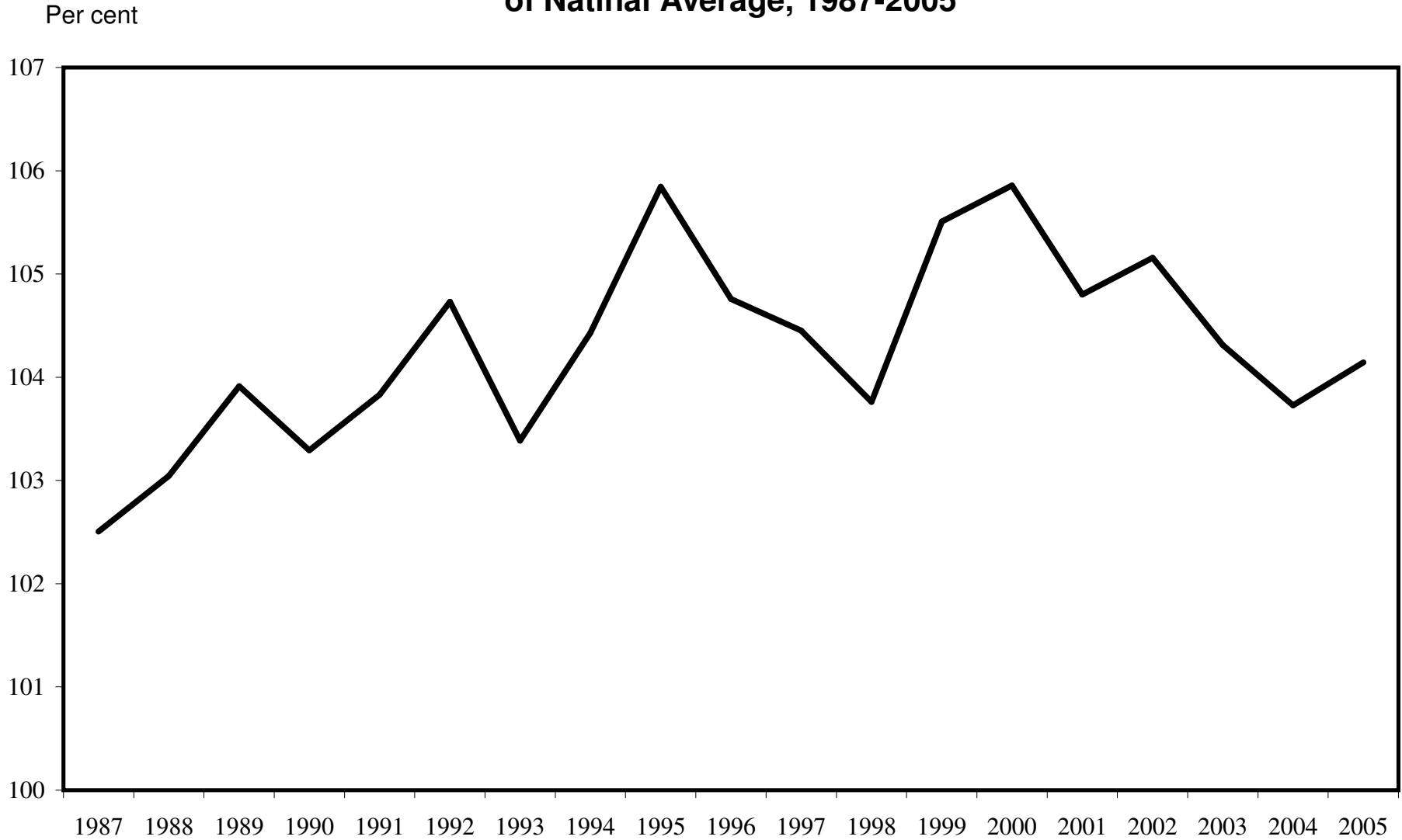
Source: Groningen Growth and Development Centre and the Conference Board, Total Economy Database, February, 2007, <http://www.ggdcc.net>

Chart 5: Canada's Ranking among OECD Countries in terms of Output per Hour



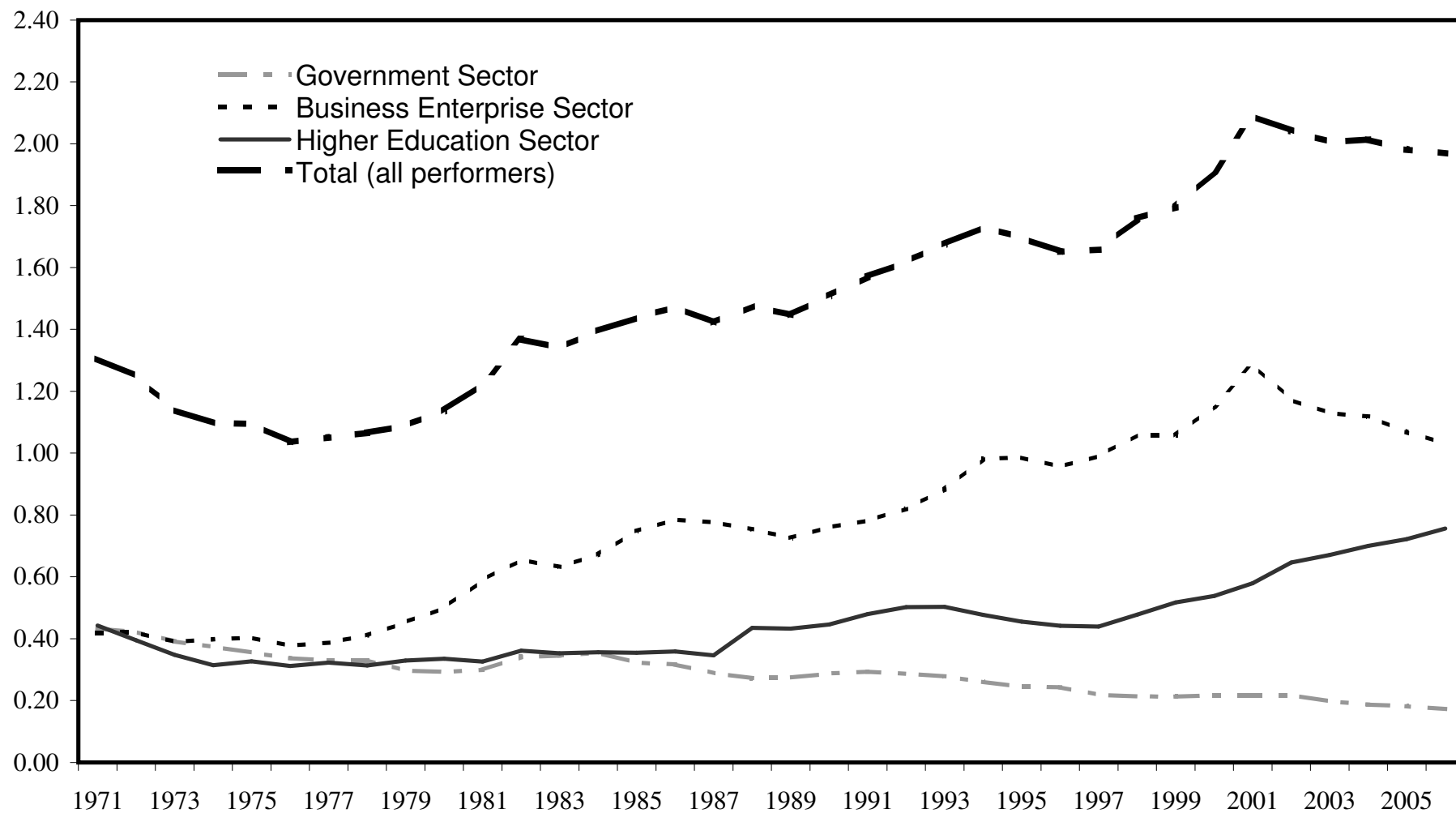
Source: Groningen Growth and Development Centre and the Conference Board, Total Economy Database, February 2007, <http://www.ggdc.net>

Chart 6: Labour Productivity Level (Output per Hour), Ontario as a Share of Natinal Average, 1987-2005



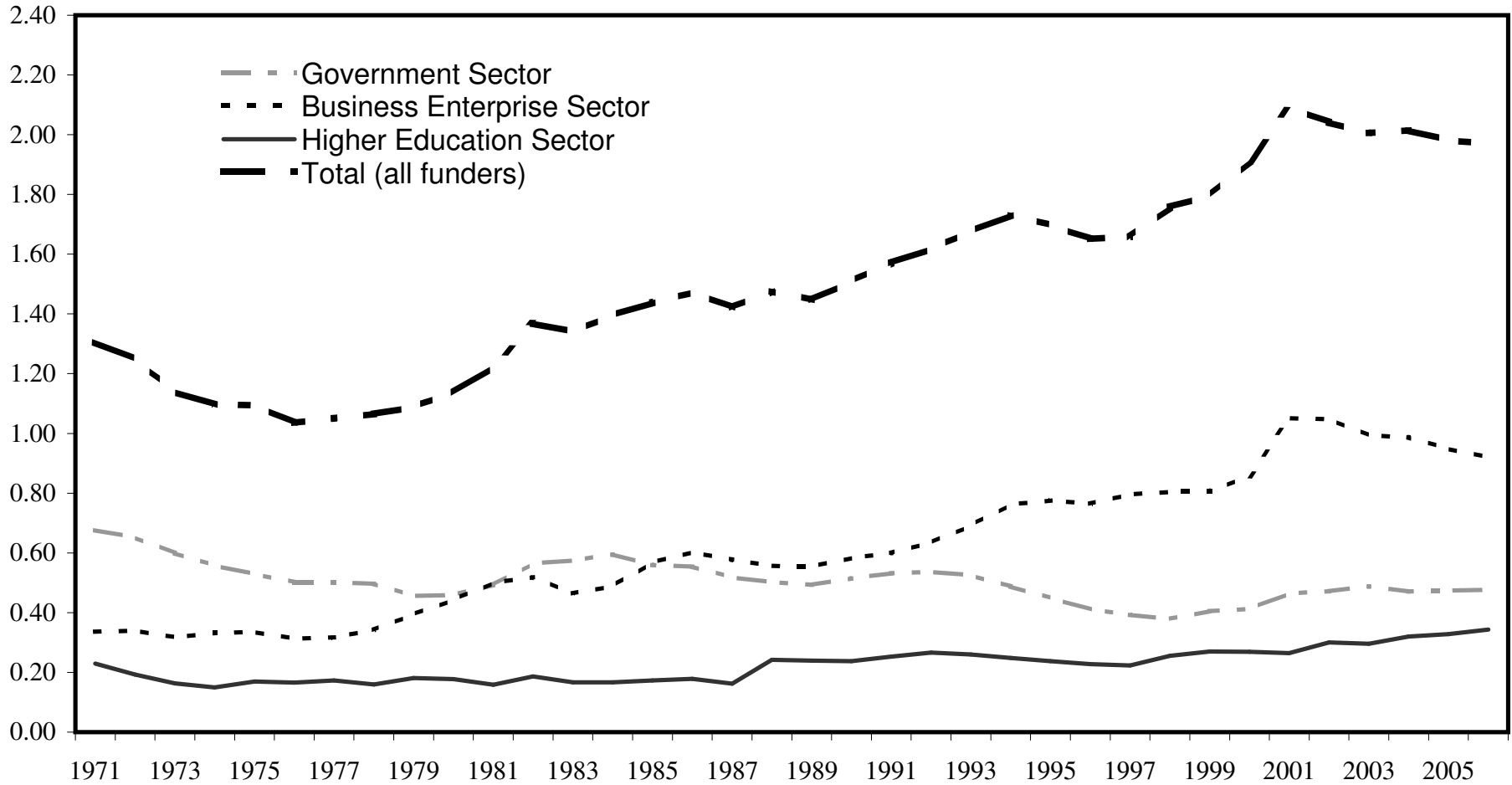
Source: CSLS Database, Labour, Capital and Total Factor Productivity by Industry for Canada and the 10 Provinces.

Chart 7: R&D Intensity in Canada by Performer, 1971-2006, Share of GDP



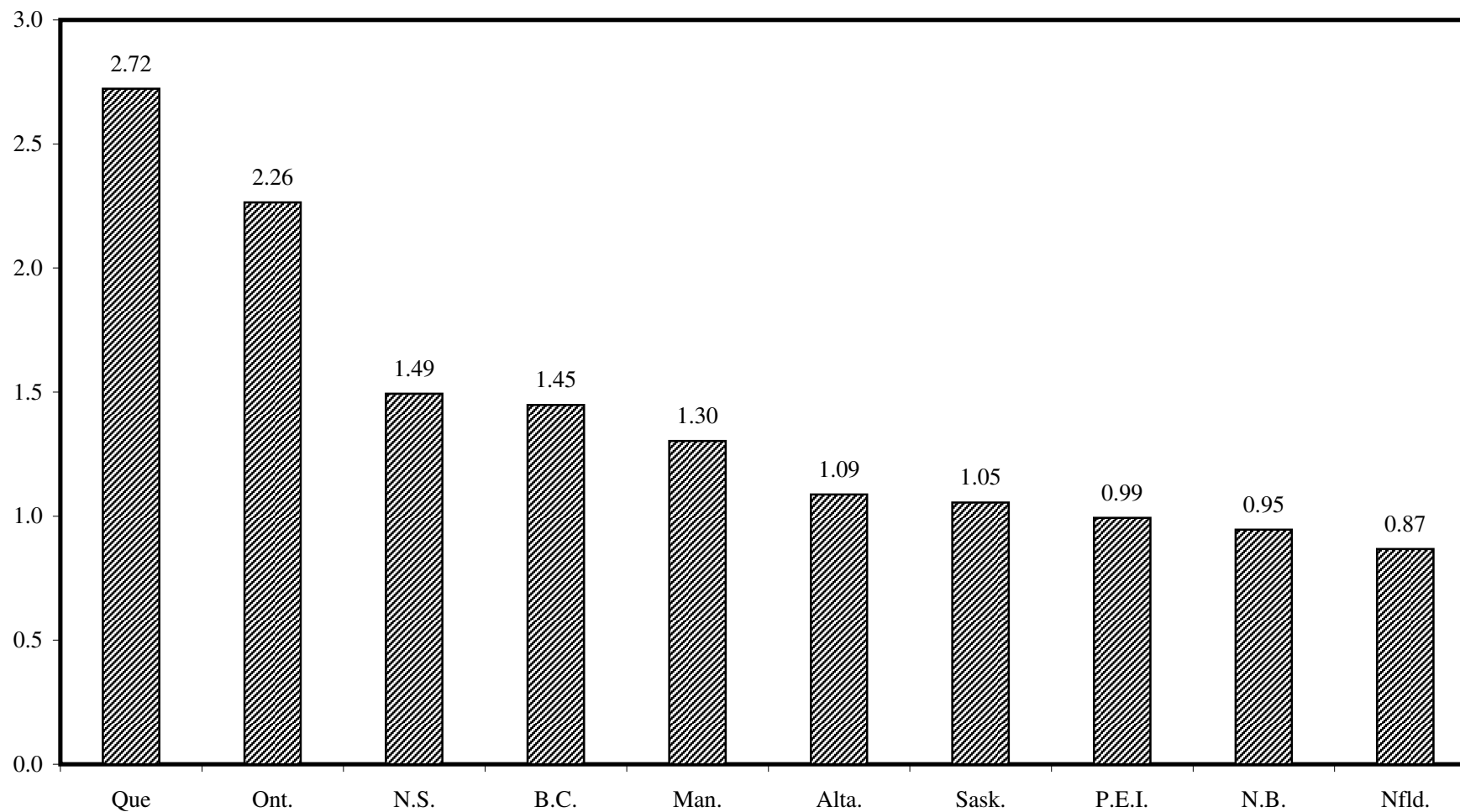
Note: Includes all sectors of funders and includes the natural sciences and engineering, social sciences and humanities .

Chart 8: R&D Intensity in Canada by Funder, 1971-2006, Share of GDP



Note: Includes all sectors of performers and includes the natural sciences and engineering, social sciences and humanities .

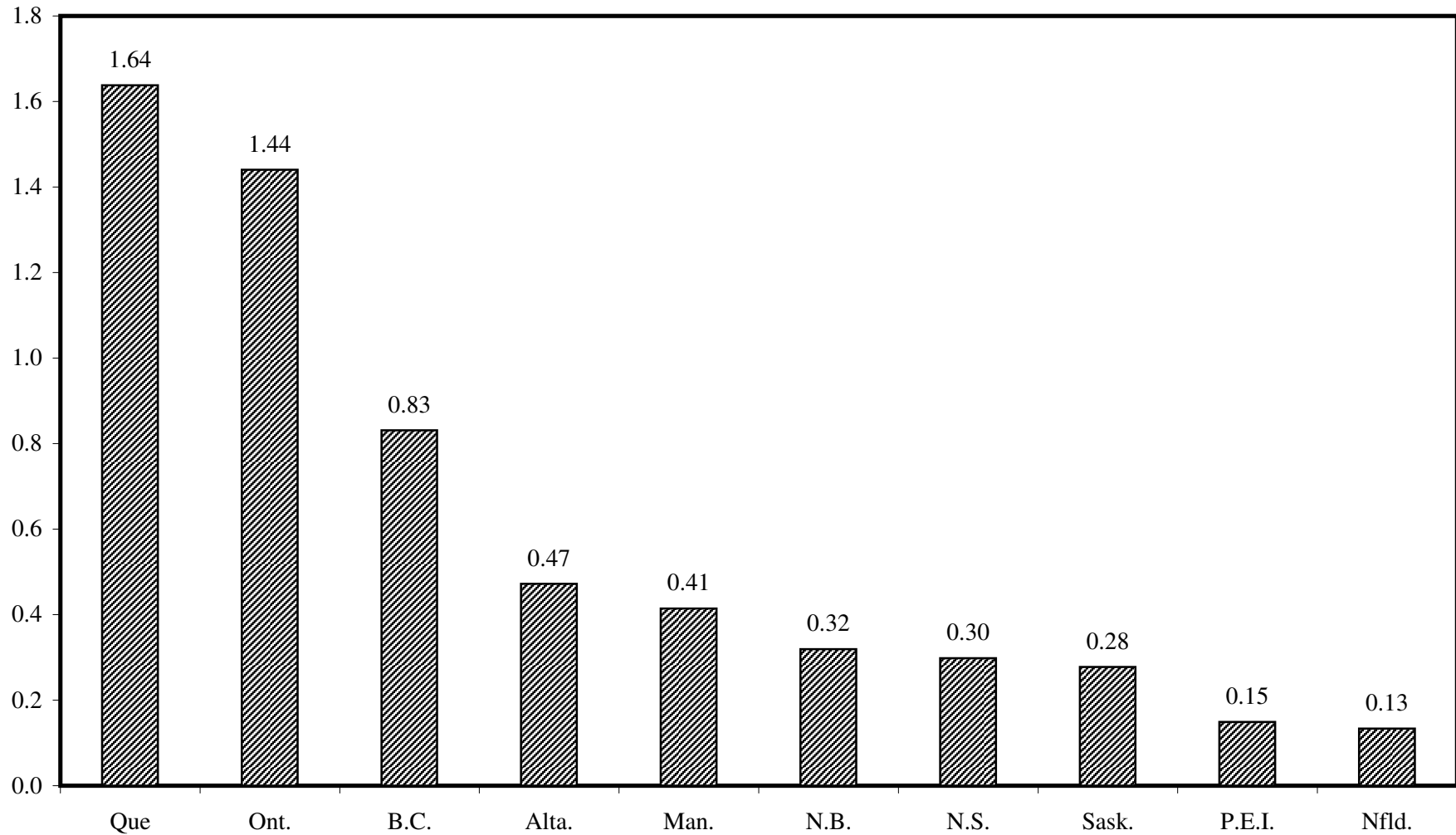
Chart 9: R&D Intensity by Province, 2004, Share of GDP



Note 1: Data for Quebec and Ontario exclude the National Capital Region.

Note 2: Includes all sectors of funders and all sectors of performers and includes the natural sciences and engineering, social sciences and humanities .

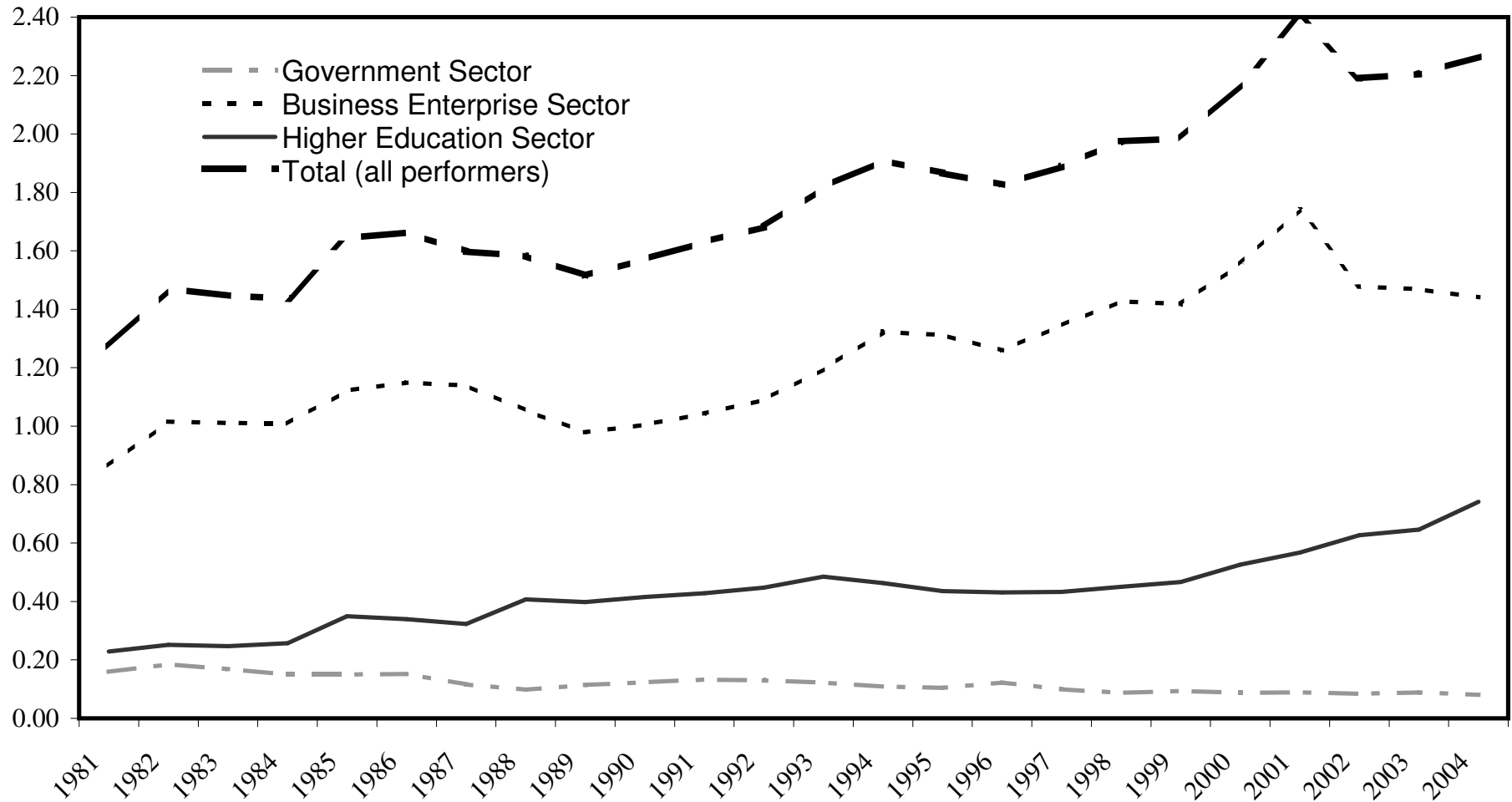
Chart 10: R&D Intensity for Business Enterprises by Province, 2004, Share of GDP



Note 1: Data for Quebec and Ontario exclude the National Capital Region.

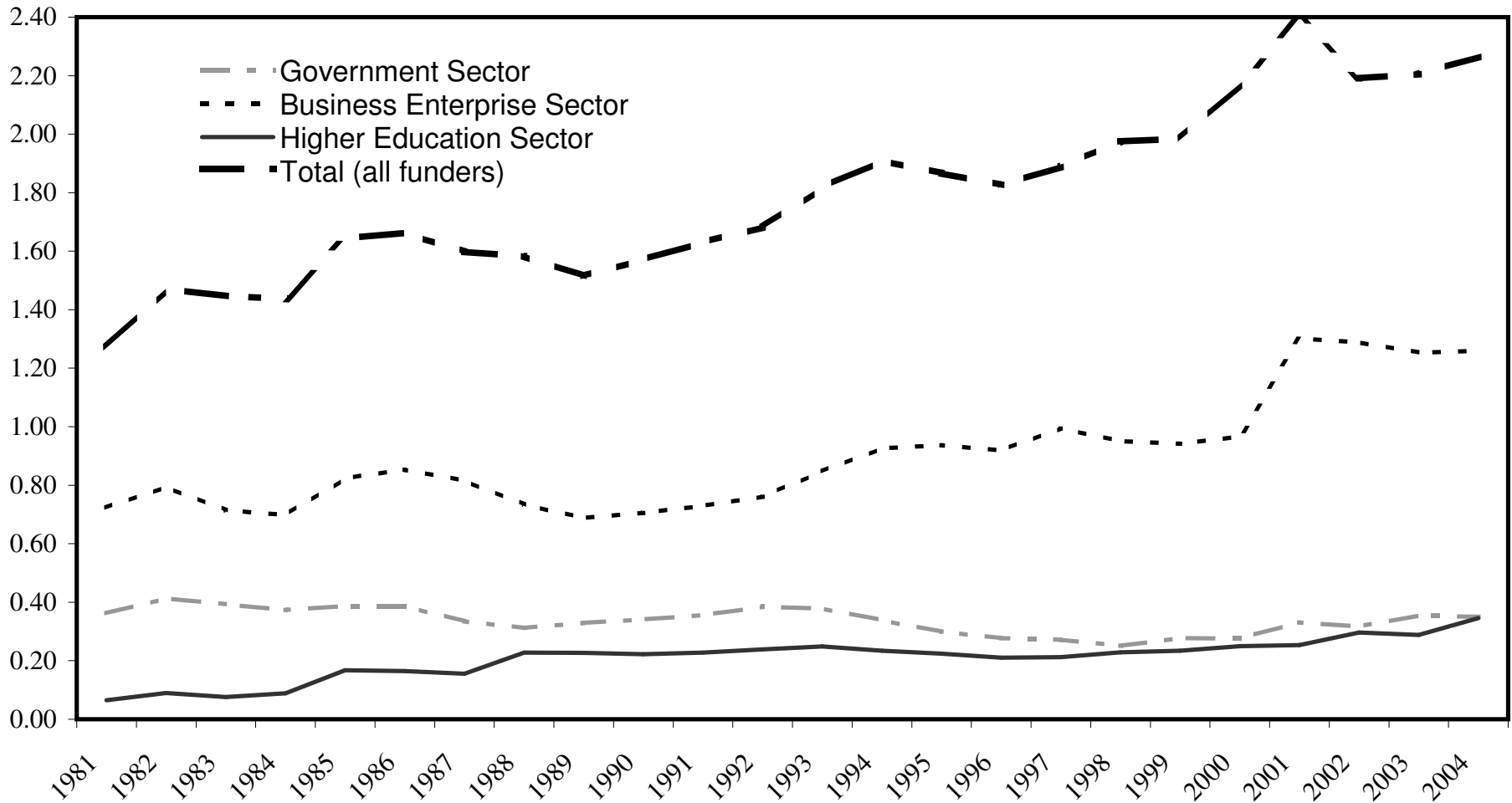
Note 2: Includes all sectors of funders and all sectors of performers and includes the natural sciences and engineering, social sciences and humanities .

Chart 11: R&D Intensity in Ontario by Performer, 1981-2004, Share of GDP



Note: Ottawa and other cities in the National Capital Region are excluded.

Chart 12: R&D Intensity in Ontario by Funder, 1981-2004, Share of GDP



Note: Ottawa and other cities in the National Capital Region are excluded.

Chart 13: Research and Development Expenditures in Ontario as a share of Total expenditures in Canada, selected Industries, 2002, percent

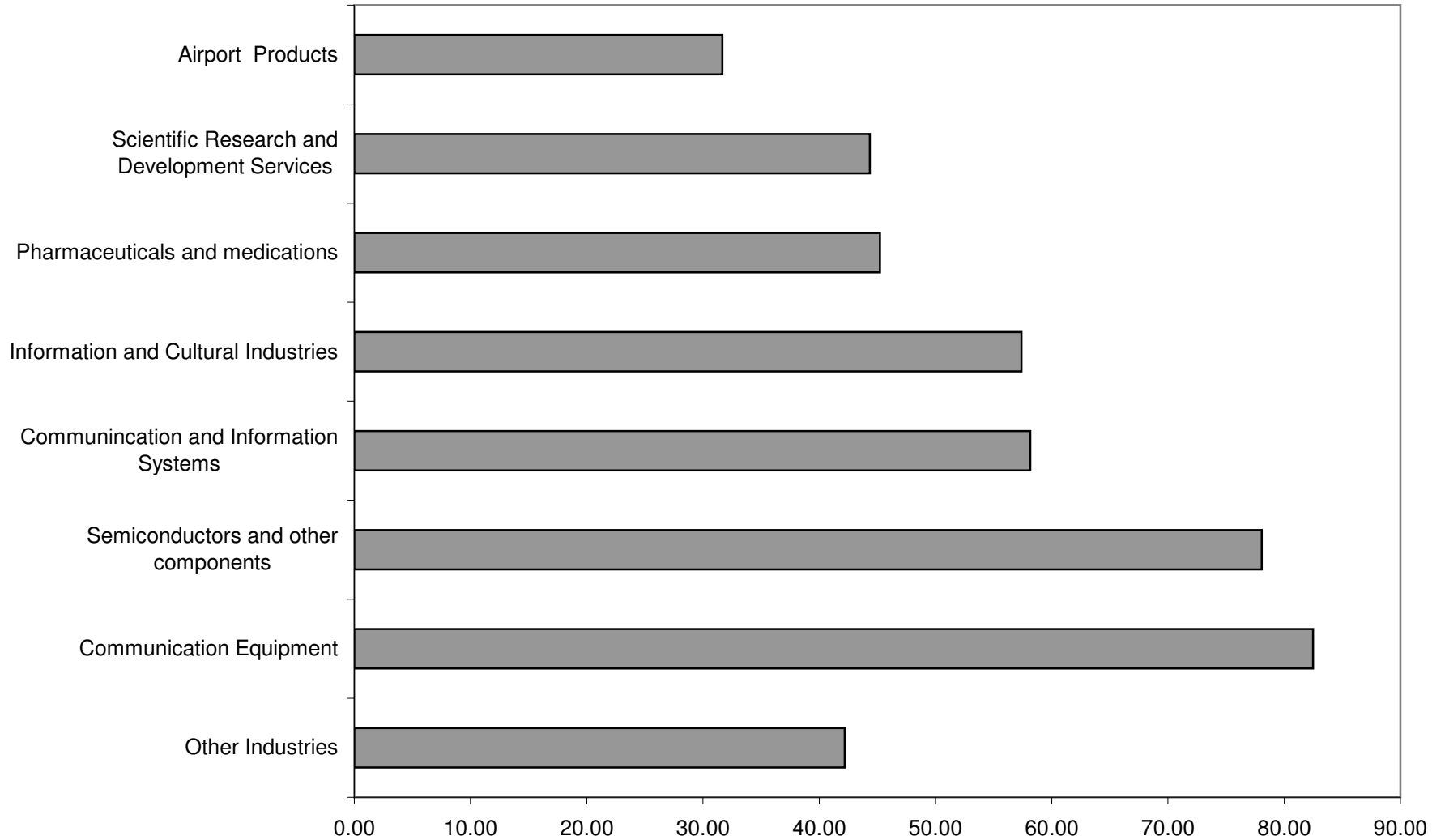


Chart 14: Expenditures for selected Industries as a share of Total Research and Development Expenditures in Ontario, 2002, percent

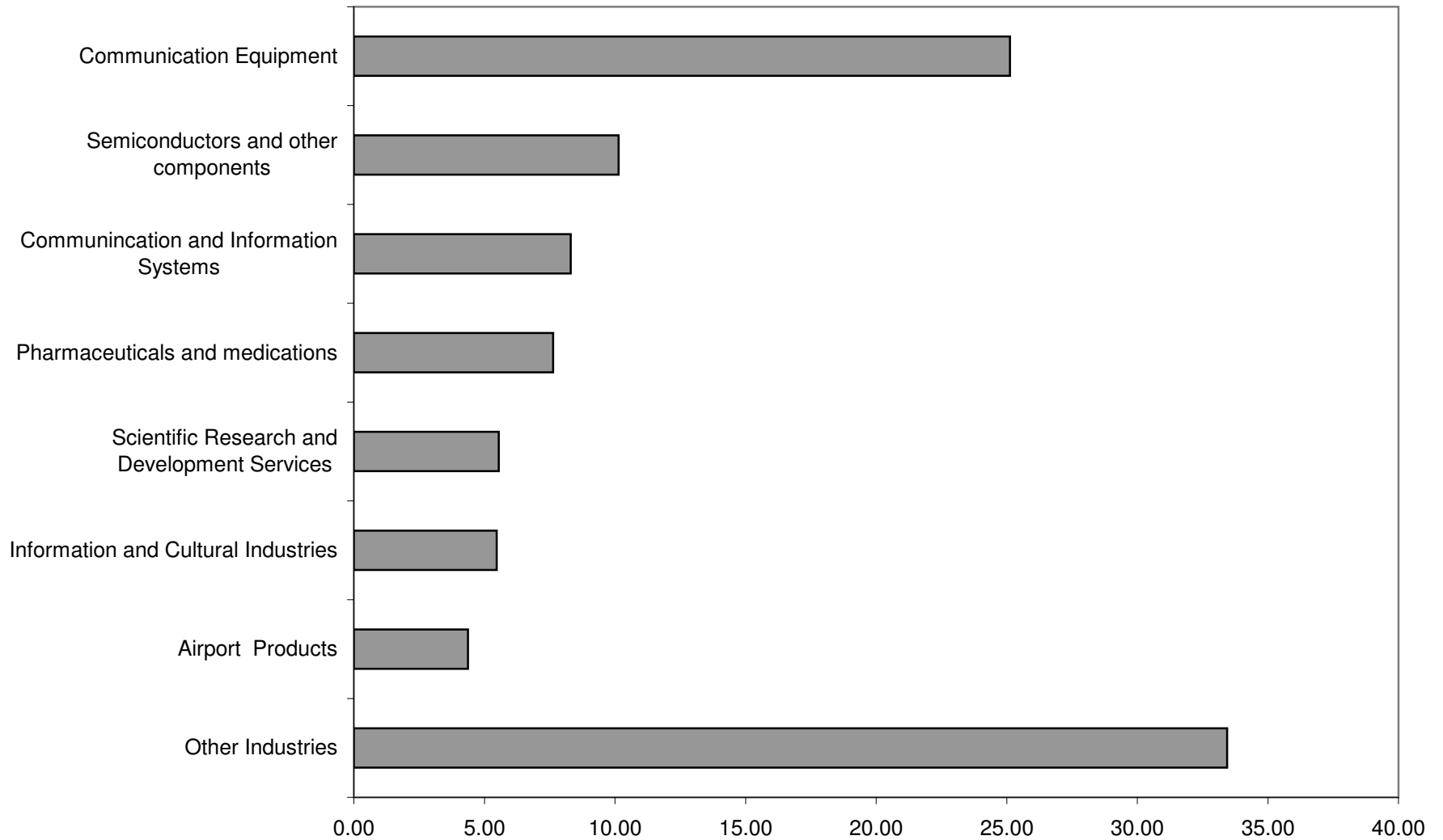
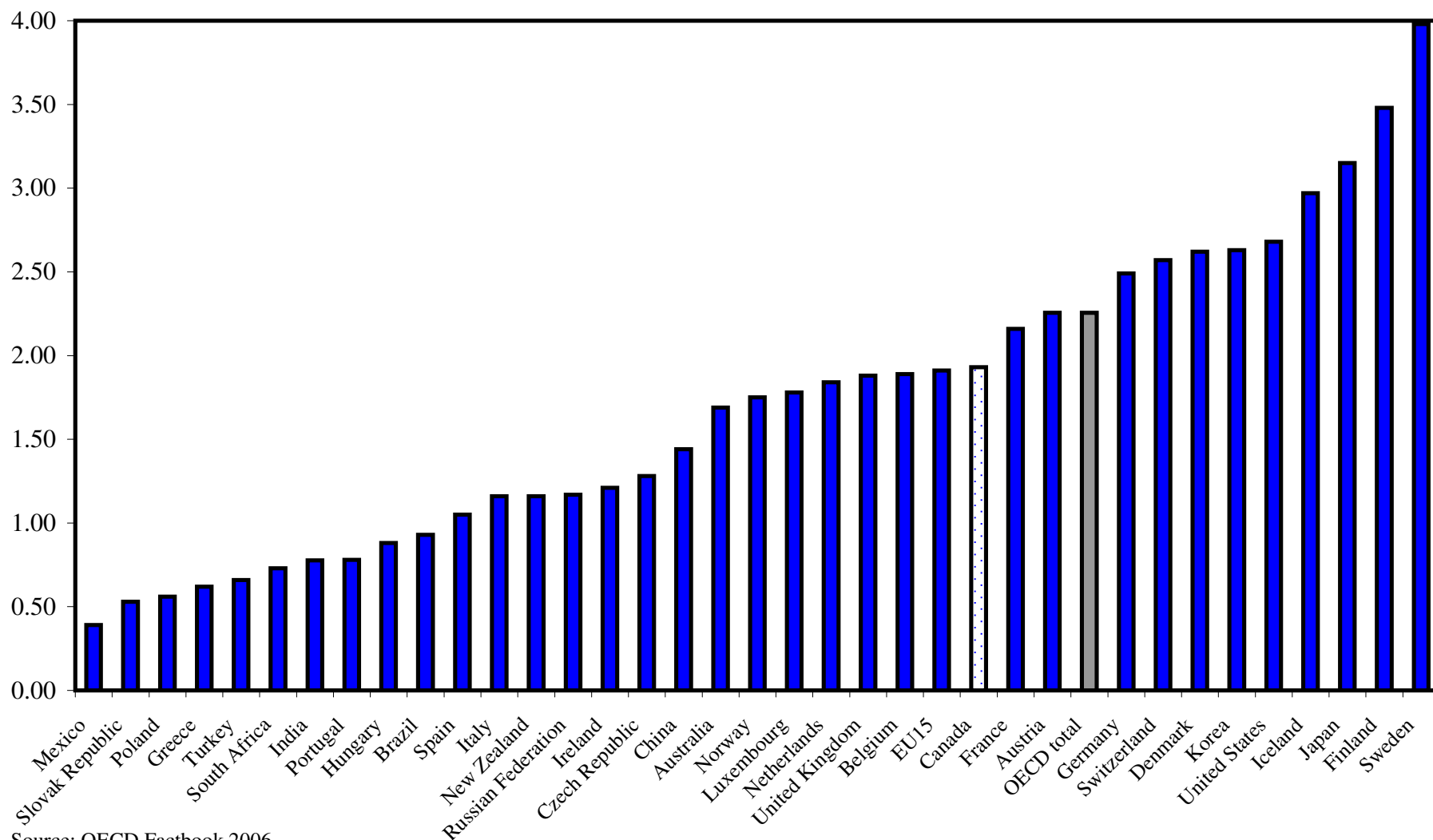
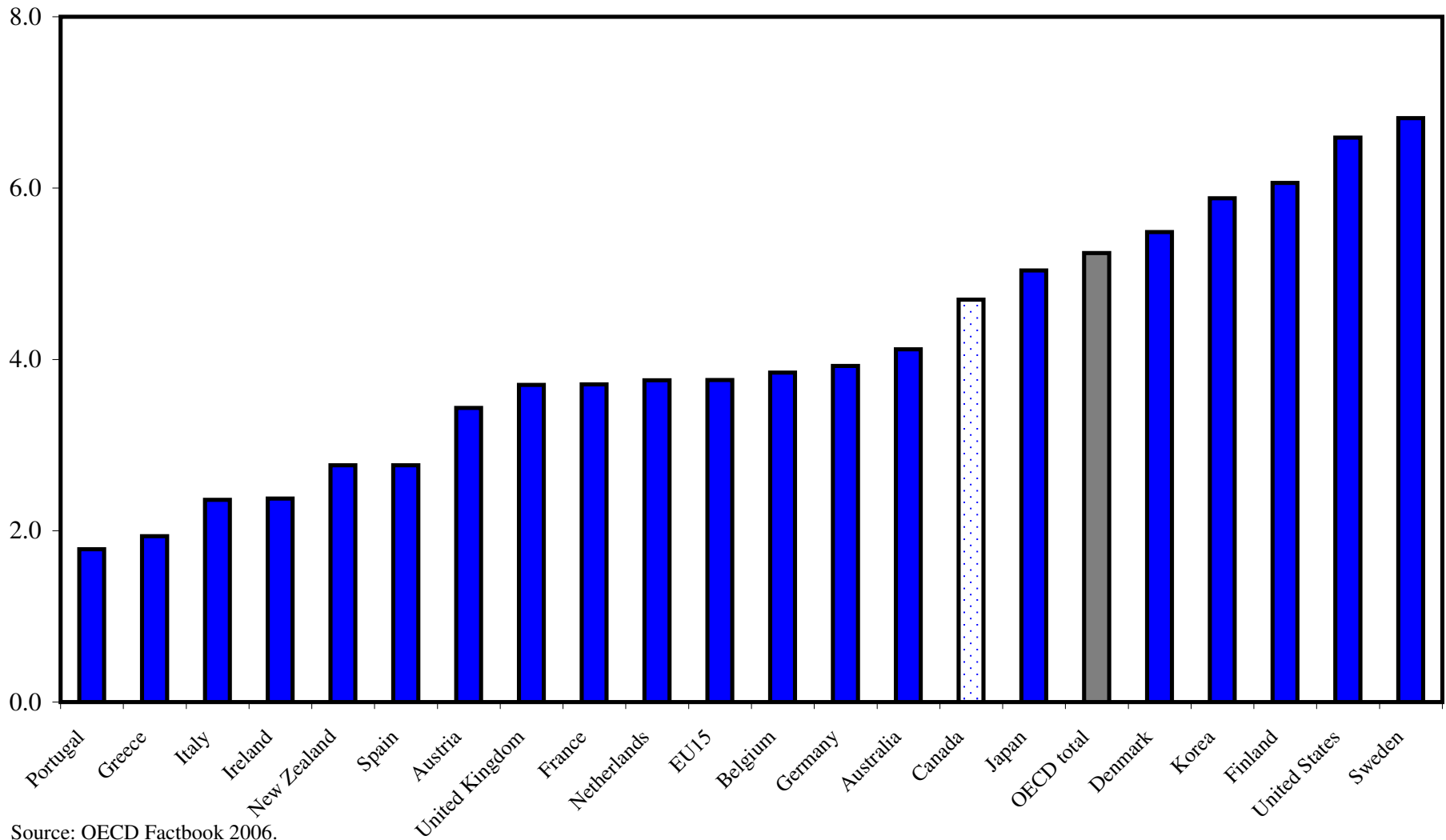


Chart 15: Gross domestic expenditure on R&D, As a percentage of GDP, 2004 or latest available year



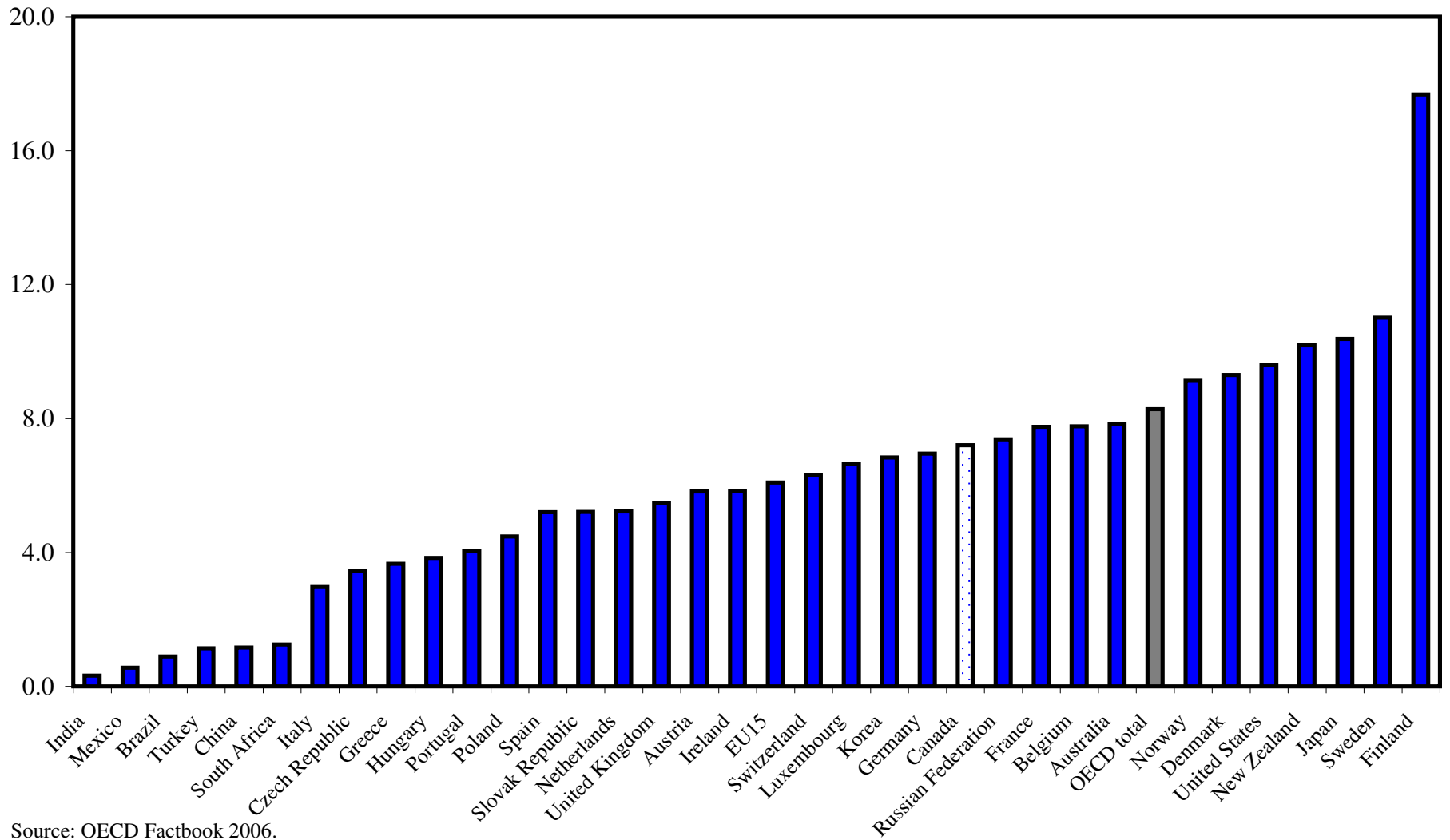
Source: OECD Factbook 2006.

Chart 16: Investment in knowledge, As a percentage of GDP, 2002 or latest available year



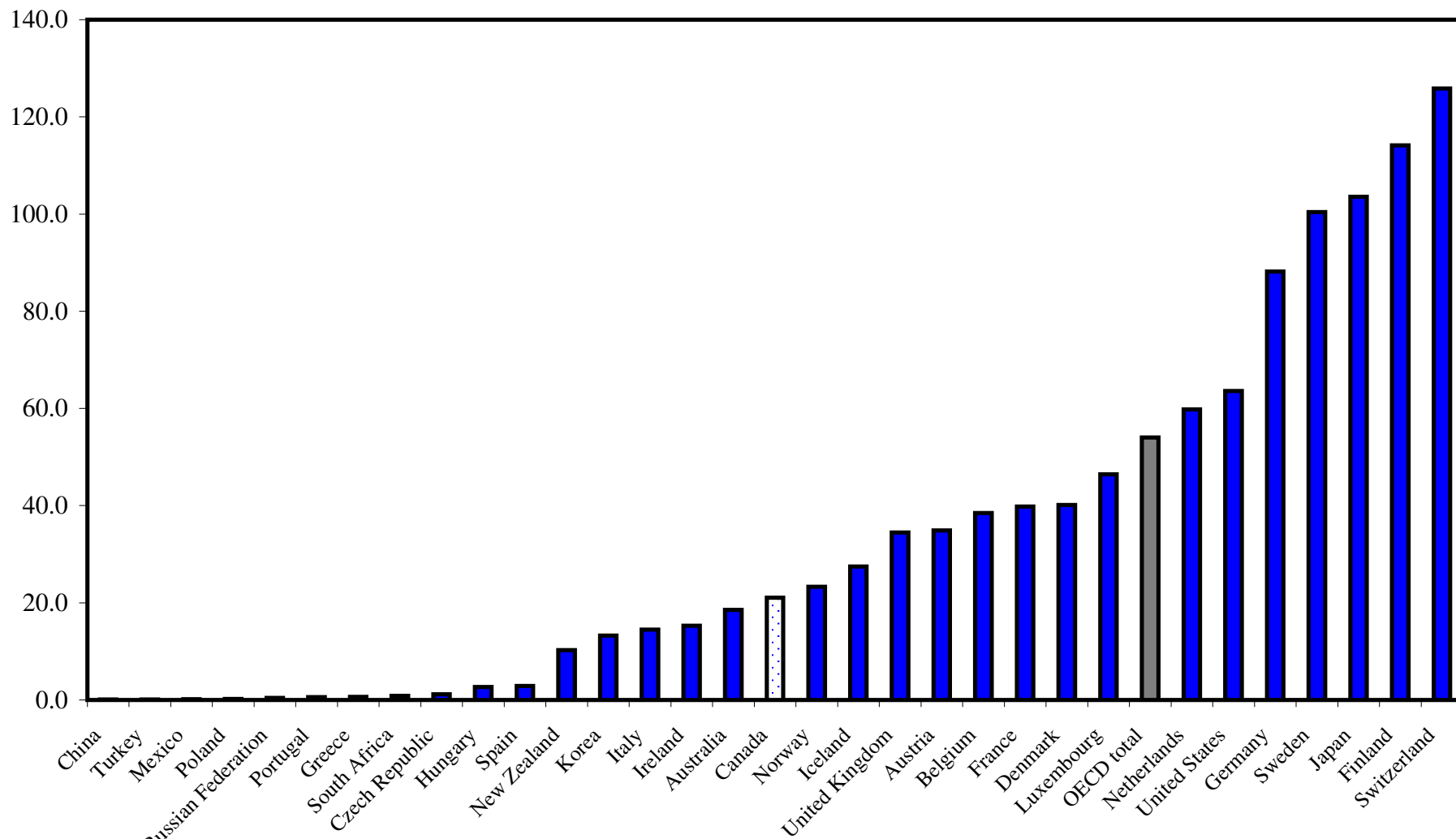
Source: OECD Factbook 2006.

**Chart 17: Researchers, per thousand employed, full-time equivalent,
2004 or latest available year**



Source: OECD Factbook 2006.

Chart 18: Number of triadic patent families, per million population, 2002



Source: OECD Factbook 2006.