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Industrial Research and Development: Intentions



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2010

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Note of appreciation

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User information

Symbols

The following standard symbols are used in Statistics Canada publications:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- p preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

Additional symbols used in this publication:

- A excellent (0 to 4.9% coefficient of variation)
- B very good (5.0% to 9.9% coefficient of variation)
- C good (10.0% to 14.9% coefficient of variation)
- D acceptable (15.0% to 24.9% coefficient of variation)

Note to readers

Figures for 2004 and 2005 on the following tables have been updated: 1, 3, 4, 5-6, 6-1, 7-4, 7-5, 11, 12-4, 13, and 15.

September, 21 2011

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Highlights

Spending on industrial research and development 2010 (intentions)

- Businesses performing industrial research and development (R&D) in Canada anticipated spending \$14.8 billion (in current dollars) in 2010. This is down 6.2% from actual spending reported in 2008 and 2.6% from 2009 planned spending estimates.
- In 2008, companies spent \$15.8 billion on industrial R&D, down \$852 million for a 5.1% decline from 2007.
- In 2010, 43% of industrial R&D spending was performed in the following five industries: scientific research and development services (\$1.6 billion), communications equipment industry (\$1.3 billion), wholesale trade (\$1.2 billion), computer system design and related services industry (\$1.1 billion), and information and cultural industries (\$1.1 billion).
- Spending in 2008 in Ontario amounted to \$7.6 billion, or 48% of the industrial R&D total. Businesses in Quebec spent \$4.6 billion, or 29% of the total.
- R&D activities provided employment to an estimated 158,926 full-time equivalent positions in 2008 increase of 15% in research effort from five years previously.

Note: Data for 2008 on employment in R&D activities, sources of funds for R&D, and industrial R&D spending distributed by provinces are also available.

Revised R&D spending intentions for 2009 are also available. Spending intentions for 2009 and 2010 are preliminary indications of the direction of R&D investments. They do not represent absolute values of R&D spending, and should be used with caution.

Analysis

Businesses performing industrial research and development (R&D) anticipated spending \$14.8 billion (in current dollars) in 2010 down slightly from 2008, which marks the generally-accepted date of the start of the global financial crisis.

The 2008 downturn of the global financial markets is echoed in the industrial R&D spending, which saw a decrease of \$852 million, or a 5.1% decline, from 2007.

Current intramural expenditures for industrial R&D include wages and salaries and other current expenditures. On average, wages and salaries continue to represent about 60% of current intramural R&D expenditures.

In 2008, the most recent year for which counts of R&D personnel are available, R&D activities provided employment to 158,926 full-time equivalent (FTE) positions, an increase of 15% in research effort from five years previously (138,177 FTE positions).

Industry Classification of research and development (R&D) Enterprises

In 2010 five industries are anticipated to exceed \$1 billion dollars in R&D expenditures. The scientific research and development services industry estimates investing \$1.6 billion, followed by the communications equipment industry at \$1.3 billion, the wholesale trade industry at \$1.2 billion, the computer system design and related services industry at \$1.1 billion, and information and cultural industries at \$1.1 billion. Together these industries are expected to represent 43% of total industrial R&D spending.

The industrial classification of firms performing R&D is annually updated based upon the North American Industry Classification System (NAICS) code indicated on Statistics Canada's Business Register, the master frame for business sector surveys. About 100,000 businesses are reviewed annually for NAICS updating – and if their industry classifications change then the industrial distribution of R&D also changes.

The Research and Development in Canadian Industry (RDCI) surveys enterprises. An enterprise is defined as a business unit that directs and controls the allocation of resources relating to its operations, and for which consolidated financial and balance sheet accounts are maintained. The activity with the most economic weight or importance determines the NAICS code that Statistics Canada assigns to the enterprise.

The economic importance of activities undertaken by enterprises can vary year to year due to changes in market conditions, including commodity price changes that may affect the value of an enterprise's revenues or exchange rate changes that may affect the value of an enterprise's import costs or export revenues.

Industries illustrating movements between NAICS codes due to changes in the influence of activities include pharmaceuticals. From year to year, the most important economic activity of these enterprises can move among pharmaceutical and pharmacy supplies wholesaler-distributors (NAICS 414510), pharmaceutical and medicine manufacturing (NAICS 325410) and scientific research and development services in the physical, engineering and life sciences (NAICS 541710).

Enterprises with economic activities related to fossil fuels, specifically oil and gas and their refined products also often show movement between NAICS codes. For example, enterprises performing R&D can move between oil and gas extraction (NAICS 2111) and petroleum and coal product manufacturing (NAICS 3241).

Sources of Funds for Industrial research and development (R&D)

Funding for industrial R&D comes from a variety of sources: from within the company; from the federal government; from foreign sources (which include intra-corporate transfer by multi-national corporations); and “other” sources (which include funds from provincial governments, higher education institutions and private non-profit organizations).

Overall, the same pattern of financing of industrial R&D continued for 2008 with the majority (79% or \$12.5 billion) of funding coming from within the performing firms themselves. Industrial R&D performers received 13% or \$2.0 billion from foreign sources, with the federal government funding 2% or \$292 million and the remainder of funds coming from other sources.

Provincial Distribution of Industrial research and development (R&D)

In 2008 industrial R&D spending continued to be highest in Ontario, where it amounted to \$7.6 billion, or 48% of the national total, and in Quebec, at \$4.6 billion or 29% of the total. Remaining provincial R&D expenditures in descending order follow: British Columbia (which includes the three Territories) at \$1.5 billion (9.8%); Alberta \$1.5 billion (9.4%); Manitoba \$160 million (1.0%); Saskatchewan \$132 million (0.8%). Together the four Atlantic provinces made up the remainder of \$317 million (2.0%).

Provinces varied with respect to the industrial sectors performing R&D. In British Columbia and the Territories, R&D in the services sector exceeded R&D performed in the manufacturing sector. This was also the case for the first time in 2008 for Quebec.

In Manitoba, Ontario and the Atlantic provinces, manufacturing remained the leading sector for R&D performance, although the share for the services sector continued to be a close second to manufacturing.

Alberta alone reported the largest share of its industrial R&D in the resource sector.

Counts of Industrial research and development (R&D) Performers

The counts of industrial R&D performers are available to 2007. The number of firms performing R&D in Canada continues to grow, reaching 22,314 in 2007.

R&D firms can perform their R&D in multiple locations and therefore can be counted in more than one province. For 2007, the count of R&D performers including those making R&D expenditures in more than one province was 23,436. Based on location of the R&D performance, the majority of R&D performers are located in the two central provinces, Quebec 8,899 (38%) and Ontario 9,373 (40%). There were 824 (3.5%) R&D performers in the Atlantic provinces; 423 (1.8%) in Manitoba; 267 (1.1%) in Saskatchewan; 1,372 (5.9%) in Alberta; and 2,278 (9.7%) in British Columbia and the Territories.

Note to readers

Also available are data on revised R&D spending intentions for 2009. Spending intentions for 2009 and 2010 are preliminary indications of the direction of R&D investments. They do not represent absolute values of R&D spending, and should be used with caution.

Data Processing & Methodology Updates: A new stratified sampling methodology was implemented for reference year 2008 to improve industrial coverage. Quality indicators have been added for reference year 2008, reflecting new edit and imputation processes. Finally, for this release Statistics Canada processed Scientific Research and Experimental Development (SR&ED) tax incentive program data from two Canada Revenue Agency forms for 2008.

In November 2008 the Canada Revenue Agency changed the SR&ED form, which discontinued the need to report the nature of R&D activities and the area of specialization of R&D activities. CRA introduced the need to report R&D expenditures by science type, which will become available for reference year 2010.

Related products

Selected publications from Statistics Canada

88-001-X	Science Statistics
88-204-X	Federal Scientific Activities
88-522-X	Science and Technology Activities and Impacts: A Framework for a Statistical Information
88F0017M	Science, Innovation and Electronic Information Division Research Papers

Selected technical and analytical products from Statistics Canada

88F0017M1999006	Diffusion of Biotechnologies in Canada: Results from the Survey of Biotechnology Use in Canadian Industries
88F0017M2000008	Explaining Rapid Growth in Canadian Biotechnology Firms
88F0017M2001010	Analysis of the Survey on Innovation, Advanced Technologies and Practices in the Construction and Related Industries, 1999
88F0017M2001011	Capacity to Innovate, Innovation and Impact: The Canadian Engineering Services Industry
88F0017M2001012	Patterns of Advanced Manufacturing Technology (AMT) Use in Canadian Manufacturing: 1998 AMT Survey Results

Selected CANSIM tables from Statistics Canada

358-0001	Gross domestic expenditures on research and development, by science type and by funder and performer sector, annual
358-0024	Business enterprise research and development (BERD) characteristics, by industry group based on the North American Industry Classification System (NAICS), annual

Selected surveys from Statistics Canada

4201	Research and Development in Canadian Industry
4205	Energy Research and Development Expenditures by Area of Technology
5113	Health Research and Development Expenditures by Therapeutic Class

Selected summary tables from Statistics Canada

- *Domestic spending on research and development (GERD), funding sector, by province*
- *Domestic spending on research and development (GERD), performing sector, by province*
- *Domestic spending on research and development (GERD)*
- *Research and development performed by the business enterprise sector*

Statistical tables

Table 1
Industrial research and development expenditures in current and 2002 constant dollars

	Current dollars			Gross domestic product implicit price index (2002)	2002 constant dollars		
	Current intramural expenditures	Capital expenditures	Total intramural expenditures		Current intramural expenditures	Capital expenditures	Total intramural expenditures
	millions of dollars				millions of dollars		
2010 ^P	13,780 ^A	1,028 ^A	14,808^A	122.6	11,240 ^A	838 ^A	12,078^A
2009 ^P	14,235 ^A	967 ^A	15,202^A	119.1	11,952 ^A	812 ^A	12,764^A
2008 ^P	14,794 ^A	998 ^B	15,792^A	121.4	12,186 ^A	822 ^B	13,008^A
2007 ^r	15,573	1,071	16,644	116.6	13,356	919	14,274
2006 ^r	15,318	1,155	16,474	113.0	13,556	1,022	14,579
2005 ^r	14,572	1,067	15,638	110.1	13,235	969	14,203
2004 ^r	14,095	1,049	15,144	106.6	13,222	984	14,206
2003	13,110	985	14,095	103.3	12,691	954	13,645
2002	12,493	1,052	13,545	100.0	12,493	1,052	13,545
2001	12,767	1,499	14,266	98.9	12,909	1,516	14,425
2000	11,201	1,194	12,395	97.8	11,453	1,221	12,674
1999	9,360	1,039	10,399	93.9	9,968	1,106	11,075
1998	8,727	955	9,682	92.3	9,455	1,035	10,490
1997	7,874	865	8,739	92.8	8,485	932	9,417
1996	7,159	838	7,997	91.6	7,816	915	8,730
1995	7,286	705	7,991	90.2	8,078	782	8,859
1994	6,938	629	7,567	88.2	7,866	713	8,579
1993	5,878	546	6,424	87.2	6,741	626	7,367
1992	5,286	457	5,742	85.9	6,154	532	6,685
1991	4,812	543	5,355	84.8	5,675	640	6,315
1990	4,541	628	5,169	82.4	5,511	762	6,273
1989	4,155	624	4,779	79.8	5,207	782	5,989
1988	3,980	643	4,623	76.4	5,209	842	6,051
1987	3,691	649	4,340	73.1	5,049	888	5,937
1986	3,447	575	4,022	69.9	4,931	823	5,754
1985	3,054	579	3,633	67.8	4,504	854	5,358

Note(s): Components may not add to totals due to rounding.

Source(s): CANSIM tables 358-0024 and 380-0056.

Table 2
International comparison of business enterprise expenditures on research and development as a percentage of Gross domestic product, by selected OECD countries

	2008 ^p	2007 ^r	2006 ^r	2005 ^r	1995
	percent				
Israel	3.75	3.88	3.50	3.43	1.51
Sweden	2.74	2.47	2.75	2.59	2.43
Finland	2.76	2.51	2.48	2.46	1.43
Japan	2.70	2.68	2.63	2.54	1.90
Korea	2.53	2.45	2.32	2.15	1.70
Switzerland	2.20
United States	2.02	1.92	1.86	1.80	1.76
Denmark	2.01	1.80	1.66	1.68	1.04
Austria	1.88	1.78	1.73	1.71	..
Germany	1.86	1.77	1.77	1.72	1.45
Iceland	1.45	1.46	1.59	1.43	0.49
Australia	1.35	1.26	1.16	1.04	0.82
Belgium	1.32	1.32	1.29	1.25	1.19
France	1.32	1.31	1.32	1.30	1.39
Luxembourg	1.22	1.32	1.43	1.35	..
United Kingdom	1.10	1.11	1.08	1.06	1.24
Canada	1.00	1.04	1.10	1.15	0.99
Ireland	0.94	0.85	0.83	0.82	0.88
Netherlands	0.88	0.96	1.01	1.01	1.03
Norway	0.88	0.88	0.82	0.82	0.96
Spain	0.74	0.71	0.67	0.60	0.38
Italy	0.65	0.61	0.55	0.55	0.52
OECD total	1.63	1.59	1.55	1.51	1.37

Note(s): Countries are presented in descending order of Business expenditures on research and development as a percentage of GDP based on their information for the most recent year reported on the table.

Source(s): OECD, Main Science and Technology Indicators. Volume 2010/2.

Table 3
Business expenditures on research and development compared to gross domestic expenditures on research and development and gross domestic product

	Business expenditures on research and development	Gross domestic expenditures on research and development	Gross domestic product	Business expenditures on research and development / Gross domestic expenditures on research and development	Business expenditures on research and development / Gross domestic product
	millions of dollars			percent	
2010 ^p	14,808 ^A	29,222	1,624,608	50.67	0.91
2009 ^p	15,202 ^A	29,394	1,528,985	51.72	0.99
2008 ^p	15,792 ^A	29,894	1,603,418	52.83	0.98
2007 ^r	16,644	29,919	1,529,589	55.63	1.09
2006 ^r	16,474	29,080	1,450,405	56.65	1.14
2005 ^r	15,638	28,023	1,373,845	55.80	1.14
2004 ^r	15,144	26,679	1,290,906	56.76	1.17
2003	14,095	24,691	1,213,175	57.09	1.16
2002	13,545	23,536	1,152,905	57.55	1.17
2001	14,266	23,133	1,108,048	61.67	1.29
2000	12,395	20,556	1,076,577	60.30	1.15
1999	10,399	17,638	982,441	58.96	1.06
1998	9,682	16,088	914,973	60.18	1.06
1997	8,739	14,635	882,733	59.71	0.99
1996	7,997	13,817	836,864	57.88	0.96
1995	7,991	13,754	810,426	58.10	0.99
1994	7,567	13,341	770,873	56.72	0.98
1993	6,424	12,184	727,184	52.72	0.88
1992	5,742	11,338	700,480	50.64	0.82
1991	5,355	10,767	685,367	49.74	0.78
1990	5,169	10,260	679,921	50.38	0.76
1989	4,779	9,517	657,728	50.22	0.73
1988	4,623	9,045	613,094	51.11	0.75
1987	4,340	7,950	558,949	54.59	0.78
1986	4,022	7,546	512,541	53.30	0.78
1985	3,633	6,985	485,714	52.01	0.75
1984	3,022	6,273	449,582	48.17	0.67
1983	2,602	5,517	411,386	47.16	0.63
1982	2,489	5,198	379,859	47.88	0.66

Source(s): CANSIM tables 358-0001 and 380-0017.

Table 4
Concentration of total intramural research and development expenditures by companies size

	Top 25	Top 50	Top 75	Top 100	Total intramural expenditures
	percent				millions of dollars
2010 P	30	40	46	50	14,808 ^A
2009 P	31	40	46	51	15,202 ^A
2008 P	30	40	47	51	15,792 ^A
2007 r	29	39	45	49	16,644
2006 r	31	42	48	51	16,474
2005 r	32	42	49	52	15,638
2004 r	33	43	49	53	15,144
2003	34	44	50	54	14,095
2002	34	44	50	54	13,545
2001	41	49	55	59	14,266
2000	46	54	60	64	12,395
1999	44	54	59	63	10,399
1998	46	55	60	64	9,682
1997	44	53	59	63	8,739
1996	41	50	56	61	7,997
1995	39	48	54	58	7,991
1994	39	49	54	58	7,567
1993	43	54	60	64	6,424
1992	45	55	60	64	5,742
1991	47	57	63	67	5,355
1990	47	58	64	68	5,169
1989	48	59	64	68	4,779
1988	49	59	64	68	4,623
1987	49	58	64	67	4,340
1986	47	57	63	67	4,022
1985	48	58	64	68	3,633

Table 5-1
Total intramural research and development expenditures by industry

	2006 ^r	2007 ^r	2008 ^p	2009 ^p	2010 ^p
	millions of dollars				
Total	16,474	16,644	15,792^A	15,202^A	14,808^A
Agriculture, forestry, fishing and hunting	118	172	106^A	112^A	116^B
Agriculture	94	94	93 ^A	97 ^A	102 ^B
Forestry and logging	20	72	6 ^A	7 ^B	7 ^C
Fishing, hunting and trapping	4	6	6 ^A	7 ^B	7 ^C
Mining and oil and gas extraction	731	662	1,035^B	681^E	F
Oil and gas extraction	663	603	994 ^B	648 ^E	F
Mining	68	59	41 ^A	34 ^D	47 ^E
Utilities	313	265	184^A	160^A	166^A
Electric power	296	239	167 ^A	x	x
Other utilities	18	26	17 ^A	x	x
Construction	85	101	120^A	89^C	F
Manufacturing	8,850	8,407	7,300^A	7,296^A	6,929^B
Food	152	151	159 ^A	174 ^A	142 ^B
Beverage and tobacco	19	25	14 ^A	x	13 ^B
Textile	58	49	43 ^A	49 ^A	33 ^C
Wood products	126	111	195 ^A	F	F
Paper	565	265	133 ^A	F	F
Printing	42	44	43 ^A	46 ^B	43 ^C
Petroleum and coal products	224	219	148 ^A	x	154 ^D
Pharmaceutical and medicine	1,085	1,045	738 ^B	761 ^A	768 ^A
Other chemicals	191	185	246 ^A	228 ^A	217 ^C
Plastic products	155	130	111 ^A	125 ^B	125 ^B
Rubber products	39	89	35 ^A	37 ^D	39 ^C
Non-metallic mineral products	76	77	60 ^A	61 ^C	67 ^D
Primary metal (ferrous)	54	53	77 ^A	F	69 ^E
Primary metal (non-ferrous)	255	299	254 ^A	195 ^B	211 ^C
Fabricated metal products	230	250	236 ^A	236 ^C	223 ^B
Machinery	576	543	520 ^A	521 ^A	520 ^D
Computer and peripheral equipment	112	109	102 ^A	93 ^C	99 ^C
Communications equipment	1,480	1,487	1,466 ^A	1,716 ^B	1,324 ^C
Semiconductor and other electronic components	847	846	448 ^A	414 ^A	386 ^B
Navigational, measuring, medical and control instruments	451	402	406 ^A	418 ^A	414 ^B
Other computer and electronic products	15	24	19 ^A	F	21 ^E
Electrical equipment, appliance and components	177	258	150 ^A	154 ^B	164 ^B
Motor vehicle and parts	608	506	401 ^A	336 ^D	306 ^D
Aerospace products and parts	972	912	990 ^A	889 ^C	966 ^C
All other transportation equipment	68	67	67 ^A	58 ^D	57 ^E
Furniture and related products	36	41	40 ^A	35 ^B	31 ^B
Other manufacturing industries	236	220	196 ^A	202 ^B	227 ^D
Services	6,376	7,037	7,048^A	6,864^A	6,730^A
Wholesale trade	813	974	1,329 ^A	1,204 ^A	1,219 ^A
Retail trade	36	55	44 ^A	41 ^B	41 ^D
Transportation and warehousing	63	74	75 ^A	54 ^C	41 ^D
Information and cultural industries	1,483	1,462	1,264 ^A	1,161 ^D	1,120 ^D
Finance, insurance and real estate	462	457	418 ^A	428 ^D	422 ^D
Architectural, engineering and related services	462	487	412 ^A	404 ^A	388 ^B
Computer system design and related services	1,178	1,268	1,193 ^A	1,298 ^B	1,140 ^C
Management, scientific and technical consulting services	61	73	65 ^A	54 ^B	55 ^C
Scientific research and development services	1,160	1,284	1,561 ^A	1,585 ^B	1,637 ^B
Health care and social assistance	339	349	304 ^C	265 ^B	308 ^B
All other services	318	555	383 ^A	369 ^B	358 ^B

Note(s): Components may not add to totals due to rounding.

Table 5-2
Total intramural research and development expenditures by province

	2006 ^r	2007 ^r	2008 ^p
millions of dollars			
Total	16,474	16,644	15,792 ^A
Newfoundland and Labrador	101	95	108 ^C
Prince Edward Island	12	13	13 ^C
Nova Scotia	106	102	94 ^C
New Brunswick	104	115	101 ^D
Quebec	4,830	4,941	4,595 ^A
Ontario	8,153	7,965	7,564 ^A
Manitoba	188	205	160 ^B
Saskatchewan	174	190	132 ^D
Alberta	1,422	1,425	1,479 ^A
British Columbia ¹	1,384	1,594	1,545 ^B

1. Includes Yukon, Northwest Territories and Nunavut.

Note(s): Components may not add to totals due to rounding.

Table 5-3
Total intramural research and development expenditures by province, by industry, 2008¹

	Atlantic Canada	Quebec	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia ¹	Total
	millions of dollars –							
Total	317^B	4,595^A	7,564^A	160^B	132^D	1,479^A	1,545^B	15,792^A
Agriculture, forestry, fishing, hunting	7^A	x	40^A	3^A	x	5^A	10^A	106^A
Agriculture	3 ^A	34 ^A	38 ^A	3 ^A	x	x	6 ^A	93 ^A
Forestry and logging	0 ^{sA}	x	1 ^A	0 ^A	x	x	2 ^A	6 ^A
Fishing, hunting and trapping	3 ^A	0 ^{sA}	1 ^A	0 ^A	0 ^A	0 ^A	2 ^A	6 ^A
Mining and oil and gas extraction	F	x	F	x	F	692^C	258^E	1,035^B
Oil and gas extraction	F	x	F	x	x	x	253 ^E	994 ^B
Mining	5 ^A	x	8 ^A	x	x	x	5 ^A	41 ^A
Utilities	x	x	45^A	x	x	x	3^A	184^A
Electric power	0 ^A	x	x	x	x	x	x	167 ^A
Other utilities	x	x	x	x	x	2 ^A	x	17 ^A
Construction	x	x	64^A	2^A	0^{sA}	x	5^A	120^A
Manufacturing	194^A	2,149^A	4,123^A	92^A	47^A	360^A	335^A	7,300^A
Food	9 ^A	62 ^A	62 ^A	3 ^A	12 ^A	3 ^A	8 ^A	159 ^A
Beverage and tobacco	x	2 ^A	x	0 ^A	0 ^A	x	1 ^A	14 ^A
Textile	1 ^A	20 ^A	19 ^A	x	x	0 ^{sA}	2 ^A	43 ^A
Wood products	2 ^A	56 ^A	x	5 ^A	x	x	34 ^A	195 ^A
Paper	x	81 ^A	28 ^A	x	x	9 ^A	x	133 ^A
Printing	0 ^A	24 ^A	17 ^A	x	0 ^A	x	2 ^A	43 ^A
Petroleum and coal products	x	x	x	0 ^A	0 ^A	x	x	148 ^A
Pharmaceutical and medicine	20 ^A	180 ^A	443 ^A	x	1 ^A	x	43 ^A	738 ^B
Other chemicals	F	39 ^B	128 ^A	2 ^A	4 ^A	69 ^A	F	246 ^A
Plastic products	x	31 ^A	66 ^A	6 ^A	x	3 ^A	3 ^A	111 ^A
Rubber products	x	13 ^A	19 ^A	x	x	x	0 ^{sA}	35 ^A
Non-metallic mineral products	2 ^A	24 ^A	31 ^A	x	x	2 ^A	2 ^A	60 ^A
Primary metal (ferrous)	x	10 ^A	61 ^A	x	x	x	x	77 ^A
Primary metal (non-ferrous)	x	125 ^A	58 ^A	x	x	x	x	254 ^A
Fabricated metal products	3 ^A	78 ^A	133 ^A	2 ^A	2 ^A	8 ^A	9 ^A	236 ^A
Machinery	8 ^A	127 ^A	319 ^A	6 ^A	16 ^A	22 ^A	22 ^A	520 ^A
Computer and peripheral equipment	x	17 ^A	56 ^A	x	0 ^A	23 ^A	7 ^A	102 ^A
Communications equipment	x	82 ^A	1,337 ^A	x	0 ^A	18 ^A	15 ^A	1,466 ^A
Semiconductor and other electronic components	4 ^A	78 ^A	289 ^A	x	x	x	70 ^A	448 ^A
Navigational, measuring, medical and control instruments	4 ^A	160 ^A	192 ^A	3 ^A	1 ^A	6 ^A	39 ^A	406 ^A
Other computer and electronic products	x	x	x	0 ^A	0 ^A	x	5 ^A	19 ^A
Electrical equipment, appliance and components	1 ^A	48 ^A	67 ^A	2 ^A	x	x	10 ^A	150 ^A
Motor vehicle and parts	x	32 ^A	346 ^A	14 ^A	x	3 ^A	3 ^A	401 ^A
Aerospace products and parts	x	682 ^A	303 ^A	x	0 ^A	x	0 ^{sA}	990 ^A
All other transportation equipment	1 ^A	44 ^A	19 ^A	x	0 ^A	x	2 ^A	67 ^A
Furniture and related products	x	17 ^A	21 ^A	0 ^{sA}	x	0 ^{sA}	1 ^A	40 ^A
Other manufacturing industries	4 ^A	109 ^A	63 ^A	1 ^A	1 ^A	4 ^A	13 ^A	196 ^A
Services	108^A	2,241^A	3,279^A	60^A	46^A	380^A	934^A	7,048^A
Wholesale trade	13 ^A	307 ^A	851 ^A	22 ^A	5 ^B	50 ^A	80 ^A	1,329 ^A
Retail trade	2 ^A	16 ^A	18 ^A	0 ^{sA}	0 ^{sA}	1 ^A	7 ^A	44 ^A
Transportation and warehousing	x	14 ^A	13 ^A	x	x	38 ^A	3 ^A	75 ^A
Information and cultural industries	34 ^A	314 ^A	634 ^A	2 ^A	6 ^A	29 ^A	245 ^A	1,264 ^A
Finance, insurance, and real estate	x	105 ^A	268 ^A	3 ^A	x	17 ^A	14 ^A	418 ^A
Architectural, engineering and related services	10 ^A	138 ^A	157 ^A	2 ^A	7 ^A	49 ^A	49 ^A	412 ^A
Computer system design and related services	22 ^A	350 ^A	583 ^A	10 ^A	4 ^A	89 ^A	135 ^A	1,193 ^A
Management, scientific and technical consulting	x	15 ^A	27 ^A	x	x	5 ^A	14 ^A	65 ^A
Scientific research and development services	13 ^A	674 ^A	502 ^A	11 ^A	3 ^A	57 ^A	302 ^A	1,561 ^A
Health care and social assistance	x	210 ^A	63 ^A	4 ^A	x	3 ^A	24 ^A	304 ^C
All other services	10 ^A	98 ^A	164 ^A	3 ^A	3 ^A	44 ^A	61 ^A	383 ^A

1. Includes Yukon, Northwest Territories and Nunavut.

Note(s): Components may not add to totals due to rounding.

Table 5-4
Total intramural research and development expenditures by country of control

	2006 ^r	2007 ^r	2008 ^p
	millions of dollars		
Total	16,474	16,644	15,792 ^A
Canada	11,280	10,982	9,895 ^A
United States	3,214	3,345	3,634 ^A
Other foreign	1,980	2,317	2,263 ^A

Note(s): Components may not add to totals due to rounding.

Table 5-5
Total intramural research and development expenditures of Canadian-controlled companies compared to all intramural research and development expenditures, by industry

	2006 ^r	2007 ^r	2008 ^p
	percent		
Total	68	66	63
Agriculture, forestry, fishing and hunting	x	x	x
Agriculture	x	65	x
Forestry and logging	100	x	100
Fishing, hunting and trapping	100	x	x
Mining and oil and gas extraction	62	56	61
Oil and gas extraction	64	58	61
Mining	43	37	50
Utilities	x	x	99
Electric power	x	x	x
Other utilities	x	x	x
Construction	x	x	x
Manufacturing	65	62	62
Food	82	78	71
Beverage and tobacco	45	x	x
Textile	73	76	74
Wood products	73	72	86
Paper	94	89	67
Printing	94	97	94
Petroleum and coal products	42	x	x
Pharmaceutical and medicine	37	35	48
Other chemicals	55	55	56
Plastic products	85	85	80
Rubber products	37	x	50
Non-metallic mineral products	41	41	55
Primary metal (ferrous)	73	21	13
Primary metal (non-ferrous)	92	18	16
Fabricated metal products	96	90	85
Machinery	84	80	79
Computer and peripheral equipment	x	x	53
Communications equipment	88	90	87
Semiconductor and other electronic components	x	x	x
Navigational, measuring, medical and control instruments	65	70	51
Other computer and electronic products	x	x	x
Electrical equipment, appliance and components	69	78	62
Motor vehicle and parts	34	37	38
Aerospace products and parts	x	x	x
All other transportation equipment	x	x	x
Furniture and related products	x	x	x
Other manufacturing industries	94	93	92
Services	72	70	62
Wholesale trade	38	42	24
Retail trade	x	x	x
Transportation and warehousing	x	95	100
Information and cultural industries	74	71	70
Finance, insurance and real estate	93	92	57
Architectural, engineering and related services	x	65	93
Computer system design and related services	80	76	73
Management, scientific and technical consulting services	96	99	x
Scientific research and development services	78	74	69
Health care and social assistance	x	x	x
All other services	x	81	82

Note(s): Components may not add to totals due to rounding.

Table 5-6
Total intramural research and development expenditures by expenditures size¹

	2004 ^r	2005 ^r	2006 ^r	2007 ^r	2008 ^p
millions of dollars					
Total	15,144	15,638	16,474	16,644	15,792^A
Less than \$50,000	155	170	186	200	179 ^D
\$50,000 to \$99,999	283	312	345	369	332 ^B
\$100,000 to \$199,999	481	526	561	598	573 ^B
\$200,000 to \$399,999	654	688	766	786	741 ^A
\$400,000 to \$999,999	957	1,037	1,117	1,125	1,174 ^A
\$1,000,000 or greater	12,615	12,905	13,499	13,566	12,794 ^A

1. Research and development program size is based on current intramural expenditures.

Note(s): Components may not add to totals due to rounding.

Table 6-1
Total intramural research and development by sources of funds

	Canadian business enterprises			Federal sources		Provincial sources	Other Canadian sources	Foreign sources	Total
	Performing companies	Related companies	Research and development contracts for other companies	Grants	Contracts				
millions of dollars									
2008 ^p	12,506 ^A	705 ^B	177 ^B	262 ^A	30 ^A	85 ^A	44 ^D	1,983 ^A	15,792^A
2007 ^r	13,191	484	158	221	35	84	59	2,411	16,644
2006 ^r	13,283	463	173	221	38	155	28	2,113	16,474
2005 ^r	12,342	401	131	289	34	90	25	2,327	15,638
2004 ^r	12,018	350	149	228	43	59	18	2,280	15,144
2003	11,102	379	153	256	44	70	17	2,073	14,095
2002	10,757	426	170	231	69	53	17	1,822	13,545
2001	10,438	301	177	345	112	51	14	2,828	14,266
2000	8,129	269	181	165	74	45	8	3,524	12,395
1999	6,967	201	213	241	68	57	8	2,642	10,399
1998	6,396	294	167	179	84	56	8	2,499	9,682
1997	6,124	268	156	253	103	77	8	1,750	8,739
1996	5,450	297	186	185	107	102	8	1,662	7,997
1995	5,383	286	259	259	152	87	10	1,555	7,991
1994	4,922	337	266	267	200	99	10	1,466	7,567
1993	4,073	347	242	266	250	105	7	1,134	6,424
1992	3,639	266	188	261	271	86	12	1,019	5,742
1991	3,388	275	162	204	212	114	11	988	5,355
1990	3,280	304	167	215	176	93	13	923	5,169
1989	2,981	325	164	239	177	69	6	819	4,779
1988	2,855	285	123	272	181	63	5	840	4,623
1987	2,714	255	125	287	155	60	9	734	4,340
1986	2,610	257	112	251	160	63	18	551	4,022
1985	2,323	241	97	215	168	60	12	518	3,633
1984	1,829	212	71	183	152	52	7	516	3,022
1983	1,608	158	76	175	106	46	3	431	2,602
1982	1,698	142	69	177	89	44	4	266	2,489
1981	1,543	123	70	132	58	37	3	158	2,124

Note(s): Components may not add to totals due to rounding.

Table 6-2
Total intramural research and development by sources of funds and by industry, 2008^p

	Canadian performing companies	Federal government and other Canadian sources	Foreign sources	Total
	millions of dollars			
Total	12,506^A	1,304^A	1,983^A	15,792^A
Agriculture, forestry, fishing and hunting	x	x	x	106^A
Agriculture	x	x	x	93 ^A
Forestry and logging	5 ^A	x	x	6 ^A
Fishing, hunting and trapping	x	x	x	6 ^A
Mining and oil and gas extraction	827^B	x	x	1,035^B
Oil and gas extraction	x	x	x	994 ^B
Mining	x	x	0 ^A	41 ^A
Utilities	176^A	x	x	184^A
Electric power	x	x	x	167 ^A
Other utilities	x	x	x	17 ^A
Construction	x	x	0^A	120^A
Manufacturing	5,955^A	438^A	907^A	7,300^A
Food	157 ^A	x	x	159 ^A
Beverage and tobacco	x	x	0 ^A	14 ^A
Textile	x	x	x	43 ^A
Wood products	195 ^A	x	x	195 ^A
Paper	99 ^A	x	x	133 ^A
Printing	43 ^A	0 ^{sA}	0 ^A	43 ^A
Petroleum and coal products	148 ^A	0 ^A	0 ^A	148 ^A
Pharmaceutical and medicine	392 ^A	95 ^A	250 ^A	738 ^B
Other chemicals	169 ^A	F	74 ^A	246 ^A
Plastic products	106 ^A	5 ^A	0 ^A	111 ^A
Rubber products	x	x	0 ^A	35 ^A
Non-metallic mineral products	59 ^A	x	x	60 ^A
Primary metal (ferrous)	x	x	0 ^A	77 ^A
Primary metal (non-ferrous)	231 ^A	x	x	254 ^A
Fabricated metal products	233 ^A	x	x	236 ^A
Machinery	485 ^A	x	x	520 ^A
Computer and peripheral equipment	72 ^A	2 ^A	29 ^A	102 ^A
Communications equipment	1,332 ^A	35 ^A	99 ^A	1,466 ^A
Semiconductor and other electronic components	x	x	x	448 ^A
Navigational, measuring, medical and control instruments	321 ^A	27 ^A	58 ^A	406 ^A
Other computer and electronic products	x	x	x	19 ^A
Electrical equipment, appliance and components	115 ^A	3 ^A	32 ^A	150 ^A
Motor vehicle and parts	388 ^A	x	x	401 ^A
Aerospace products and parts	747 ^A	177 ^A	67 ^A	990 ^A
All other transportation equipment	x	x	x	67 ^A
Furniture and related products	x	x	0 ^A	40 ^A
Other manufacturing industries	188 ^A	x	x	196 ^A
Services	5,378^A	620^A	1,050^A	7,048^A
Wholesale trade	1,022 ^A	23 ^B	283 ^A	1,329 ^A
Retail trade	40 ^A	0 ^{sA}	3 ^A	44 ^A
Transportation and warehousing	x	x	x	75 ^A
Information and cultural industries	1,022 ^A	49 ^A	193 ^A	1,264 ^A
Finance, insurance and real estate	x	x	0 ^A	418 ^A
Architectural, engineering and related services	305 ^A	36 ^A	71 ^A	412 ^A
Computer system design and related services	1,033 ^A	67 ^A	93 ^A	1,193 ^A
Management, scientific and technical consulting services	59 ^A	x	x	65 ^A
Scientific research and development services	1,058 ^A	211 ^A	292 ^A	1,561 ^A
Health care and social assistance	x	103 ^A	x	304 ^C
All other services	334 ^A	x	x	383 ^A

Note(s): Components may not add to totals due to rounding.

Table 6-3
Total intramural research and development by sources of funds and by size of expenditures,¹ 2008^p

	Performing company	Federal government	Provincial government	Other Canadian sources	Foreign sources	Total
	percent					
Total	79	2	1	6	13	100
Less than \$50,000	96	0	0	1	2	100
\$50,000 to \$99,999	96	1	0	1	2	100
\$100,000 to \$199,999	96	1	0	1	2	100
\$200,000 to \$399,999	96	1	0	1	2	100
\$400,000 to \$999,999	93	1	0	2	3	100
\$1,000,000 or greater	76	2	1	7	15	100

1. Research and development size is based on current intramural expenditures.

Note(s): Components may not add to totals due to rounding.

Table 6-4
Total intramural research and development by sources of funds and by country of control of performer, 2008^p

	Canadian performing companies	Federal government	Provincial government	Other Canadian sources	Foreign sources	Total
	millions of dollars					
Total	12,506^A	292^A	85^A	926^A	1,983^A	15,792^A
Canada	8,636 ^A	159 ^A	51 ^A	505 ^A	545 ^A	9,895 ^A
United States	2,426 ^A	x	x	266 ^A	826 ^A	3,634 ^A
Other foreign	1,445 ^A	x	x	155 ^E	612 ^A	2,263 ^A

Note(s): Components may not add to totals due to rounding.

Table 7-1
Current intramural research and development expenditures by industry

	2006 ^r	2007 ^r	2008 ^p	2009 ^p	2010 ^p
	millions of dollars				
Total	15,318	15,573	14,794^A	14,235^A	13,780^A
Agriculture, forestry, fishing and hunting	113	165	x	x	x
Agriculture	89	89	90 ^A	93 ^A	98 ^B
Forestry and logging	20	72	x	x	x
Fishing, hunting and trapping	4	5	6 ^A	7 ^B	6 ^C
Mining and oil and gas extraction	x	558	873^B	560^C	641^C
Oil and gas extraction	x	505	836 ^B	529 ^D	596 ^C
Mining	63	53	37 ^A	31 ^D	44 ^C
Utilities	x	x	x	x	x
Electric power	x	x	x	x	x
Other utilities	17	x	x	x	x
Construction	83	x	100^A	x	x
Manufacturing	8,396	8,002	6,879^A	6,785^A	6,384^A
Food	144	145	152 ^A	167 ^A	137 ^A
Beverage and tobacco	19	24	14 ^A	x	13 ^A
Textile	56	46	41 ^A	47 ^A	31 ^A
Wood products	121	109	x	x	x
Paper	563	263	132 ^A	121 ^E	x
Printing	40	42	43 ^A	46 ^A	43 ^B
Petroleum and coal products	205	165	x	133 ^C	x
Pharmaceutical and medicine	1,034	999	701 ^A	706 ^A	734 ^A
Other chemicals	185	175	235 ^A	217 ^A	201 ^B
Plastic products	148	125	108 ^A	122 ^A	121 ^A
Rubber products	38	x	35 ^A	37 ^A	38 ^B
Non-metallic mineral products	74	76	56 ^A	57 ^B	62 ^D
Primary metal (ferrous)	x	51	76 ^A	70 ^A	68 ^B
Primary metal (non-ferrous)	175	x	222 ^A	x	x
Fabricated metal products	227	244	229 ^A	229 ^A	212 ^A
Machinery	565	532	505 ^A	509 ^A	505 ^B
Computer and peripheral equipment	109	106	98 ^A	89 ^A	91 ^B
Communications equipment	1,380	1,393	1,370 ^A	1,554 ^A	x
Semiconductor and other electronic components	801	813	427 ^A	402 ^A	376 ^B
Navigational, measuring, medical and control instruments	440	390	397 ^A	408 ^A	400 ^A
Other computer and electronic products	14	23	19 ^A	21 ^A	20 ^C
Electrical equipment, appliance and components	168	247	145 ^A	149 ^A	160 ^B
Motor vehicle and parts	583	487	391 ^A	327 ^A	299 ^A
Aerospace products and parts	x	891	x	x	x
All other transportation equipment	67	x	x	x	x
Furniture and related products	36	41	38 ^A	35 ^A	31 ^B
Other manufacturing industries	225	207	188 ^A	194 ^A	216 ^B
Services	5,969	6,563	6,670^A	6,553^A	6,397^A
Wholesale trade	761	908	1,262 ^A	1,152 ^A	1,165 ^A
Retail trade	x	54	43 ^A	41 ^A	40 ^C
Transportation and warehousing	x	73	68 ^A	49 ^B	39 ^C
Information and cultural industries	1,354	1,305	1,196 ^A	1,098 ^B	1,056 ^B
Finance, insurance and real estate	450	445	390 ^A	406 ^D	402 ^D
Architectural, engineering and related services	440	460	399 ^A	395 ^A	375 ^A
Computer system design and related services	1,124	1,224	1,155 ^A	1,264 ^A	1,103 ^B
Management, scientific and technical consulting services	58	71	62 ^A	52 ^A	53 ^A
Scientific research and development services	1,070	1,167	1,437 ^A	1,492 ^A	1,529 ^B
Health care and social assistance	323	337	292 ^A	254 ^A	292 ^A
All other services	300	520	366 ^A	352 ^A	343 ^B

Note(s): Components may not add to totals due to rounding.

Table 7-2
Current intramural research and development expenditures by industry and by type of expenditures, 2008^P

	Wages and salaries	Other costs	Total
millions of dollars			
Total	8,928^A	5,866^A	14,794^A
Agriculture, forestry, fishing and hunting	59^A	x	x
Agriculture	52 ^A	38 ^A	90 ^A
Forestry and logging	4 ^A	x	x
Fishing, hunting and trapping	3 ^A	3 ^A	6 ^A
Mining and oil and gas extraction	F	726^B	873^B
Oil and gas extraction	F	705 ^C	836 ^B
Mining	17 ^A	20 ^A	37 ^A
Utilities	104^A	x	x
Electric power	92 ^A	x	x
Other utilities	12 ^A	x	x
Construction	64^A	36^A	100^A
Manufacturing	4,158^A	2,721^A	6,879^A
Food	98 ^A	54 ^A	152 ^A
Beverage and tobacco	11 ^A	3 ^A	14 ^A
Textile	29 ^A	12 ^A	41 ^A
Wood products	x	84 ^A	x
Paper	49 ^A	83 ^A	132 ^A
Printing	36 ^A	7 ^A	43 ^A
Petroleum and coal products	30 ^E	x	x
Pharmaceutical and medicine	295 ^A	406 ^A	701 ^A
Other chemicals	138 ^A	96 ^A	235 ^A
Plastic products	77 ^A	31 ^A	108 ^A
Rubber products	20 ^A	15 ^A	35 ^A
Non-metallic mineral products	x	x	56 ^A
Primary metal (ferrous)	59 ^E	17 ^A	76 ^A
Primary metal (non-ferrous)	88 ^A	134 ^A	222 ^A
Fabricated metal products	181 ^A	48 ^A	229 ^A
Machinery	366 ^A	139 ^A	505 ^A
Computer and peripheral equipment	72 ^A	26 ^A	98 ^A
Communications equipment	906 ^A	464 ^A	1,370 ^A
Semiconductor and other electronic components	320 ^A	108 ^A	427 ^A
Navigational, measuring, medical and control instruments	303 ^A	95 ^A	397 ^A
Other computer and electronic products	16 ^A	3 ^A	19 ^A
Electrical equipment, appliance and components	106 ^A	39 ^A	145 ^A
Motor vehicle and parts	248 ^A	143 ^A	391 ^A
Aerospace products and parts	x	524 ^A	x
All other transportation equipment	x	30 ^A	x
Furniture and related products	32 ^A	6 ^A	38 ^A
Other manufacturing industries	142 ^B	46 ^A	188 ^A
Services	4,396^A	2,275^A	6,670^A
Wholesale trade	664 ^A	598 ^A	1,262 ^A
Retail trade	34 ^A	8 ^A	43 ^A
Transportation and warehousing	36 ^A	32 ^A	68 ^A
Information and cultural industries	770 ^A	425 ^A	1,196 ^A
Finance, insurance and real estate	211 ^C	179 ^A	390 ^A
Architectural, engineering and related services	291 ^A	109 ^A	399 ^A
Computer system design and related services	998 ^A	157 ^A	1,155 ^A
Management, scientific and technical consulting services	50 ^A	12 ^A	62 ^A
Scientific research and development services	915 ^A	522 ^A	1,437 ^A
Health care and social assistance	163 ^A	129 ^A	292 ^A
All other services	262 ^A	103 ^A	366 ^A

Note(s): Components may not add to totals due to rounding.

Table 7-3
Current intramural research and development expenditures by province

	2006 ^r	2007 ^r	2008 ^p
	millions of dollars		
Total	15,318	15,573	14,794^A
Newfoundland and Labrador	x	x	x
Prince Edward Island	x	x	13 ^A
Nova Scotia	103	x	x
New Brunswick	102	x	97 ^D
Quebec	4,600	4,727	4,405 ^A
Ontario	7,678	7,492	7,142 ^A
Manitoba	181	197	155 ^B
Saskatchewan	127	176	123 ^D
Alberta	1,161	1,219	1,272 ^B
British Columbia ¹	1,288	1,475	1,428 ^B

1. Includes Yukon, Northwest Territories and Nunavut.

Note(s): Components may not add to totals due to rounding.

Table 7-4
Current intramural research and development expenditures as a percentage of performing company revenues, by company revenue size

	2004 ^r	2005 ^r	2006 ^r	2007 ^r	2008 ^p
	percent				
Total	1.8	1.7	1.7	1.7	1.8
Less than \$1,000,000	48.7	39.2	38.4	39.9	36.8
\$1,000,000 to \$9,999,999	7.5	7.6	7.0	6.9	7.1
\$10,000,000 to \$49,999,999	3.6	3.2	3.3	3.5	3.7
\$50,000,000 to \$99,999,999	2.7	2.9	2.7	3.0	2.7
\$100,000,000 to \$399,999,999	2.8	2.4	2.0	2.3	2.4
\$400,000,000 or greater	1.0	0.9	1.0	1.0	1.1

Table 7-5
Current intramural research and development expenditures as a percentage performing company revenues, by country of control

	2004 ^r	2005 ^r	2006 ^r	2007 ^r	2008 ^p
	percent				
Total	1.8	1.7	1.7	1.7	1.8
Canada	2.0	1.9	1.9	1.9	2.2
Foreign	1.4	1.4	1.3	1.5	1.4
United States	1.4	1.5	1.4	1.4	1.7
Other foreign	1.3	1.2	1.2	1.6	1.1

Table 7-6

 Current intramural research and development expenditures as a percentage of performing company revenues, by industry and by country of control, 2008^p

	Canada	Foreign	Total
	percent		
Total	2.2	1.4	1.8
Agriculture, forestry, fishing and hunting	x	x	x
Agriculture	x	x	2.6
Forestry and logging	x	0.0	x
Fishing, hunting and trapping	x	x	1.9
Mining and oil and gas extraction	0.9	0.4	0.6
Oil and gas extraction	1.1	0.4	0.6
Mining	0.2	0.4	0.3
Utilities	0.5	x	x
Electric power	x	x	x
Other utilities	x	x	x
Construction	x	x	1.6
Manufacturing	2.7	1.2	1.8
Food	0.5	0.2	0.3
Beverage and tobacco	1.7	0.1	0.3
Textile	2.2	1.8	2.1
Wood products	1.4	x	x
Paper	2.3	0.8	1.4
Printing	1.7	0.7	1.5
Petroleum and coal products	x	x	x
Pharmaceutical and medicine	8.7	4.6	6.0
Other chemicals	1.8	0.6	1.0
Plastic products	1.4	0.6	1.1
Rubber products	2.3	0.5	0.8
Non-metallic mineral products	1.2	0.4	0.6
Primary metal (ferrous)	1.7	0.5	0.6
Primary metal (non-ferrous)	0.8	1.2	1.1
Fabricated metal products	1.8	1.0	1.6
Machinery	3.6	2.2	3.2
Computer and peripheral equipment	6.6	2.6	3.9
Communications equipment	14	6.7	12.2
Semiconductor and other electronic components	x	x	5.3
Navigational, measuring, medical and control instruments	7.7	9.1	8.3
Other computer and electronic products	x	x	9.6
Electrical equipment, appliance and components	3.6	0.6	1.2
Motor vehicle and parts	1.2	0.4	0.5
Aerospace products and parts	x	x	x
All other transportation equipment	x	x	x
Furniture and related products	x	x	1.1
Other manufacturing industries	3.6	1.3	3.2
Services	2.3	3.8	2.7
Wholesale trade	1.3	2.5	2.1
Retail trade	1.4	0.3	1.2
Transportation and warehousing	0.5	0.0	0.5
Information and cultural industries	2.9	11.8	3.7
Finance, insurance and real estate	0.3	2.6	0.5
Architectural, engineering and related services	4.1	1.3	3.5
Computer system design and related services	12.1	12.7	12.2
Management, scientific and technical consulting services	x	x	8.5
Scientific research and development services	36.5	21.1	29.8
Health care and social assistance	x	x	28.8
All other services	x	x	1.7

Table 8
Average total intramural research and development expenditures, by performing company revenue size, 2007

	Firms	Expenditures	Average expenditures
	number	millions of dollars	
Total	22,314	16,644	0.7
Non-commercial firms	198	240	1.2
Less than \$1,000,000	8,247	1,332	0.2
\$1,000,000 to \$9,999,999	9,766	2,534	0.3
\$10,000,000 to \$49,999,999	2,871	2,250	0.8
\$50,000,000 to \$99,999,999	510	1,111	2.2
\$100,000,000 to \$399,999,999	470	2,168	4.6
\$400,000,000 or greater	252	7,009	27.8

Table 9
Intramural research and development expenditures, by province, 2008^p

	Current expenditures	Capital expenditures	Total expenditures
	millions of dollars		
Total	14,794^A	998^B	15,792^A
Newfoundland and Labrador	x	x	108 ^C
Prince Edward Island	13 ^A	F	13 ^C
Nova Scotia	x	x	94 ^C
New Brunswick	97 ^D	4 ^B	101 ^D
Quebec	4,405 ^A	190 ^A	4,595 ^A
Ontario	7,142 ^A	421 ^A	7,564 ^A
Manitoba	155 ^B	6 ^E	160 ^B
Saskatchewan	123 ^D	9 ^D	132 ^D
Alberta	1,272 ^B	207 ^A	1,479 ^A
British Columbia ¹	1,428 ^B	117 ^A	1,545 ^B

1. Includes Yukon, Northwest Territories and Nunavut

Note(s): Components may not add to totals due to rounding.

Table 10
Capital intramural research and development expenditures, by industry

	2006 ^r	2007 ^r	2008 ^p	2009 ^p	2010 ^p
	millions of dollars				
Total	1,155	1,071	998^B	967^A	1,028^A
Agriculture, forestry, fishing and hunting	5	7	x	x	x
Agriculture	4	6	3 ^A	4 ^A	3 ^A
Forestry and logging	0 ^s	0 ^s	x	x	x
Fishing, hunting and trapping	0 ^s	1	0 ^{sA}	1 ^A	0 ^{sA}
Mining and oil and gas extraction	x	104	F	122^A	122^A
Oil and gas extraction	x	98	F	118 ^A	119 ^A
Mining	5	6	4 ^A	3 ^A	3 ^A
Utilities	x	x	x	x	x
Electric power	x	x	x	x	x
Other utilities	1	x	x	1 ^A	1 ^A
Construction	2	x	20^A	x	x
Manufacturing	454	405	421^A	511^A	545^A
Food	8	6	6 ^A	7 ^A	5 ^A
Beverage and tobacco	0 ^s	0 ^s	0 ^{sA}	0 ^{sA}	0 ^{sA}
Textile	2	2	2 ^A	2 ^A	1 ^A
Wood products	5	2	x	x	x
Paper	3	3	1 ^E	2 ^A	x
Printing	1	2	1 ^B	1 ^A	1 ^A
Petroleum and coal products	20	55	x	x	x
Pharmaceutical and medicine	51	45	37 ^A	56 ^A	34 ^A
Other chemicals	7	10	12 ^C	11 ^A	15 ^A
Plastic products	7	5	4 ^A	3 ^A	4 ^A
Rubber products	1	x	0 ^{sA}	1 ^A	0 ^{sA}
Non-metallic mineral products	2	1	4 ^C	4 ^A	5 ^A
Primary metal (ferrous)	x	2	F	0 ^{sA}	1 ^A
Primary metal (non-ferrous)	80	x	33 ^A	x	x
Fabricated metal products	3	6	7 ^A	7 ^A	11 ^A
Machinery	11	11	15 ^C	12 ^A	15 ^A
Computer and peripheral equipment	3	3	5 ^A	4 ^B	8 ^A
Communications equipment	100	94	96 ^A	162 ^A	x
Semiconductor and other electronic components	46	33	20 ^A	12 ^A	10 ^A
Navigational, measuring, medical and control instruments	11	11	9 ^A	10 ^A	14 ^A
Other computer and electronic products	1	1	0 ^{sA}	0 ^{sA}	0 ^{sA}
Electrical equipment, appliance and components	9	11	5 ^B	5 ^A	4 ^A
Motor vehicle and parts	25	19	10 ^A	9 ^A	7 ^A
Aerospace products and parts	x	21	x	x	x
All other transportation equipment	1	x	x	x	x
Furniture and related products	0 ^s	0 ^s	2 ^D	1 ^A	1 ^A
Other manufacturing industries	12	13	F	7 ^A	11 ^A
Services	407	475	378^A	311^A	333^A
Wholesale trade	52	65	66 ^A	52 ^A	55 ^A
Retail trade	x	1	1 ^A	1 ^A	1 ^A
Transportation and warehousing	x	1	7 ^A	5 ^A	2 ^A
Information and cultural industries	129	157	69 ^A	64 ^A	64 ^A
Finance, insurance and real estate	12	12	28 ^D	22 ^A	20 ^B
Architectural, engineering and related services	22	27	13 ^B	9 ^A	13 ^A
Computer system design and related services	55	43	38 ^A	34 ^A	37 ^A
Management, scientific and technical consulting services	3	3	3 ^B	2 ^A	2 ^A
Scientific research and development services	91	117	124 ^A	93 ^A	108 ^A
Health care and social assistance	16	13	11 ^A	11 ^A	16 ^A
All other services	18	35	17 ^A	17 ^A	15 ^A

Note(s): Components may not add to totals due to rounding.

Table 11
Total research and development personnel, by selected industries

	2004 ^r	2005 ^r	2006 ^r	2007 ^r	2008 ^p
	number				
Total research and development personnel	138,213	142,025	151,726	164,103	158,926^D
	percent				
Computer system design and related services	13	12	12	13	12
Information and cultural industries	7	8	7	7	7
Scientific research and development	7	7	7	8	8
Communications equipment	7	7	6	6	6
Wholesale trade	5	5	5	6	7
Pharmaceutical and medicine	4	4	4	4	3
Aerospace products and parts	3	3	4	3	3
Other industries	54	53	54	54	54

Note(s): Components may not add to totals due to rounding. Personnel counts are reported as full-time equivalent.

Table 12-1
Personnel engaged in research and development by industry group and by region, 2008^p

	Atlantic Canada	Quebec	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia ¹	Total
	number							
Total	3,853^B	55,469^A	73,040^A	2,035^C	1,248^C	8,773^B	14,508^A	158,926^D
Agriculture, forestry, fishing and hunting	211 ^D	1,488 ^B	930 ^B	F	F	F	316 ^D	3,079 ^C
Mining and oil and gas extraction	x	F	F	x	F	1,547 ^E	F	F
Utilities	x	642 ^A	416 ^A	x	11 ^D	32 ^D	35 ^E	F
Construction	F	1,122 ^B	792 ^B	F	F	F	F	2,268 ^E
Manufacturing	1,910 ^B	25,581 ^A	38,205 ^A	1,028 ^D	535 ^D	2,732 ^C	3,765 ^C	73,756 ^D
Services	1,661 ^B	26,483 ^A	32,606 ^A	874 ^C	604 ^C	4,285 ^B	10,174 ^A	76,687 ^C

1. Includes Yukon, Northwest Territories and Nunavut.

Note(s): Components may not add to totals due to rounding. Personnel counts are reported as full-time equivalent.

Table 12-2
Personnel engaged in research and development by province and by occupational category, 2008^p

	Professionals	Other personnel ²	Total
	number		
Total	90,303^A	68,623^A	158,926^D
Newfoundland and Labrador	302 ^D	262 ^C	564 ^B
Prince Edward Island	F	115 ^C	215 ^D
Nova Scotia	1,026 ^C	930 ^B	1,956 ^B
New Brunswick	530 ^C	588 ^B	1,118 ^B
Quebec	27,994 ^A	27,475 ^A	55,469 ^A
Ontario	44,229 ^A	28,811 ^A	73,040 ^A
Manitoba	829 ^D	1,206 ^C	2,035 ^C
Saskatchewan	645 ^D	603 ^C	1,248 ^C
Alberta	5,384 ^B	3,389 ^B	8,773 ^B
British Columbia ¹	9,264 ^B	5,244 ^B	14,508 ^A

1. Includes Yukon, Northwest Territories and Nunavut.

2. Includes technicians and other.

Note(s): Components may not add to totals due to rounding. Personnel counts are reported as full-time equivalent.

Table 12-3
Personnel engaged in research and development by industry and by occupational category, 2008^p

	Professionals	Technicians	Other	Total
	number			
Total	90,303^A	47,173^A	21,450^A	158,926^D
Agriculture, forestry, fishing and hunting	915^D	1,106^C	1,058^B	3,079^C
Agriculture	779 ^D	953 ^C	944 ^B	2,676 ^D
Forestry and logging	82 ^C	114 ^C	49 ^D	245 ^D
Fishing, hunting and trapping	F	F	65 ^D	158 ^D
Mining and oil and gas extraction	1,146^E	F	F	F
Oil and gas extraction	1,001 ^E	F	F	F
Mining	145 ^B	115 ^A	38 ^D	298 ^E
Utilities	670^D	330^A	172^E	F
Electric power	496 ^E	x	x	F
Other utilities	174 ^B	x	x	F
Construction	767^C	983^B	518^B	2,268^E
Manufacturing	39,908^A	22,794^A	11,054^A	73,756^D
Food	1,074 ^B	1,078 ^B	705 ^B	F
Beverage and tobacco	86 ^B	129 ^A	59 ^A	274 ^D
Textile	269 ^C	335 ^B	271 ^B	F
Wood products	436 ^D	577 ^C	230 ^D	F
Paper	504 ^D	381 ^D	216 ^D	F
Printing	370 ^B	658 ^A	189 ^B	F
Petroleum and coal products	175 ^A	78 ^B	39 ^C	292 ^E
Pharmaceutical and medicine	2,252 ^A	1,100 ^A	1,325 ^A	4,677 ^B
Other chemicals	1,408 ^B	958 ^B	493 ^C	2,859 ^D
Plastic products	892 ^A	856 ^B	468 ^B	2,216 ^D
Rubber products	285 ^D	158 ^E	F	F
Non-metallic mineral products	500 ^C	428 ^C	216 ^C	1,144 ^D
Primary metal (ferrous)	F	F	F	F
Primary metal (non-ferrous)	564 ^A	446 ^A	102 ^B	1,112 ^D
Fabricated metal products	2,175 ^B	2,537 ^B	1,113 ^B	5,825 ^E
Machinery	3,978 ^A	3,648 ^A	1,175 ^B	8,801 ^D
Computer and peripheral equipment	766 ^A	246 ^B	95 ^B	1,107 ^B
Communications equipment	8,648 ^A	798 ^B	565 ^A	10,011 ^B
Semiconductor and other electronic components	3,230 ^A	555 ^B	279 ^C	4,064 ^C
Navigational, measuring, medical and control instruments	3,777 ^A	1,155 ^A	279 ^B	5,211 ^A
Other computer and electronic products	154 ^A	50 ^B	22 ^B	226 ^D
Electrical equipment, appliance and components	1,115 ^C	938 ^C	324 ^C	2,377 ^D
Motor vehicle and parts	1,864 ^C	1,297 ^D	703 ^D	F
Aerospace products and parts	2,644 ^A	1,229 ^B	736 ^B	F
All other transportation equipment	332 ^B	311 ^B	181 ^C	F
Furniture and related products	399 ^B	812 ^B	442 ^C	1,653 ^D
Other manufacturing industries	1,592 ^B	1,739 ^B	605 ^C	3,936 ^E
Services	46,897^A	21,531^A	8,259^A	76,687^C
Wholesale trade	6,418 ^A	2,981 ^B	1,541 ^B	10,940 ^E
Retail trade	570 ^B	531 ^B	222 ^B	1,323 ^E
Transportation and warehousing	353 ^B	292 ^C	168 ^C	813 ^E
Information and cultural industries	6,982 ^A	2,601 ^B	1,558 ^A	11,141 ^A
Finance, insurance and real estate	2,047 ^C	826 ^E	F	3,271 ^E
Architectural, engineering and related services	3,788 ^A	1,921 ^A	459 ^B	6,168 ^D
Computer system design and related services	12,500 ^A	4,771 ^B	1,110 ^C	18,381 ^C
Management, scientific and technical consulting services	967 ^B	299 ^D	106 ^E	F
Scientific research and development services	8,458 ^A	3,402 ^A	1,354 ^B	13,214 ^B
Health care and social assistance	1,231 ^A	1,247 ^A	576 ^A	3,054 ^B
All other services	3,583 ^A	2,660 ^A	767 ^C	7,010 ^D

Note(s): Components may not add to totals due to rounding. Personnel counts are reported as full-time equivalent.

Table 12-4
Personnel engaged in research and development by occupational category

	2004 ^r	2005 ^r	2006 ^r	2007 ^r	2008 ^p
	number				
Total	138,213	142,025	151,726	164,103	158,926^D
Professionals	81,349	84,408	88,226	92,758	90,303 ^A
Technicians	39,872	40,405	44,510	50,820	47,173 ^A
Other	16,992	17,212	18,990	20,525	21,450 ^A

Note(s): Components may not add to totals due to rounding. Personnel counts are reported as full-time equivalent.

Table 13
Professional personnel engaged in research and development, by degree level

	Bachelors	Masters	Doctorates	Total
	number			
2008 ^p	63,237 ^D	17,331 ^D	9,735 ^E	90,303^A
2007 ^r	71,691	14,713	6,354	92,758
2006 ^r	68,510	13,999	5,717	88,226
2005 ^r	64,297	14,311	5,800	84,408
2004 ^r	61,471	14,101	5,777	81,349
2003	58,370	12,589	5,642	76,601

Note(s): Data are estimated for all performers not surveyed directly, i.e. performers for whom data were obtained through the Canada Revenue Agency's SR&ED program (see Survey Methodology). Components may not add to totals due to rounding. Personnel counts are reported as full-time equivalent.

Table 14-1
Total extramural payments for research and development, by industry and by year

	2006 ^r	2007 ^r	2008 ^p	2009 ^p	2010 ^p
	millions of dollars				
Total	4,217	4,275	3,790^A	2,692^A	2,708^A
Agriculture, forestry, fishing and hunting	16	26	16^E	3^A	x
Agriculture	14	9	9 ^E	2 ^A	0 ^A
Forestry and logging	2	x	F	x	0 ^A
Fishing, hunting and trapping	1	x	2 ^C	x	x
Mining and oil and gas extraction	80	53	64^B	32^A	x
Oil and gas extraction	55	40	45 ^C	29 ^A	28 ^A
Mining	25	14	19 ^D	4 ^A	x
Utilities	90	101	105^A	109^A	x
Electric power	82	91	100 ^A	x	x
Other utilities	8	10	6 ^C	x	x
Construction	13	13	15^D	5^A	0^A
Manufacturing	2,108	1,909	1,223^A	881^A	604^A
Food	24	20	115 ^A	16 ^A	9 ^A
Beverage and tobacco	x	8	F	1 ^A	x
Textile	x	3	3 ^D	1 ^A	0 ^A
Wood products	27	21	21 ^B	10 ^A	9 ^A
Paper	29	19	17 ^D	3 ^A	4 ^A
Printing	2	x	x	1 ^C	0 ^A
Petroleum and coal products	69	60	x	x	x
Pharmaceutical and medicine	527	557	394 ^A	432 ^A	411 ^A
Other chemicals	55	70	25 ^C	9 ^A	5 ^A
Plastic products	13	11	12 ^A	6 ^A	3 ^A
Rubber products	x	10	5 ^D	x	x
Non-metallic mineral products	x	7	5 ^E	1 ^A	3 ^A
Primary metal (ferrous)	9	x	4 ^A	x	x
Primary metal (non-ferrous)	71	53	36 ^B	23 ^A	13 ^A
Fabricated metal products	23	20	23 ^D	8 ^A	0 ^A
Machinery	63	56	55 ^D	28 ^A	19 ^A
Computer and peripheral equipment	15	6	10 ^D	5 ^A	2 ^A
Communications equipment	212	127	162 ^A	113 ^A	27 ^A
Semiconductor and other electronic components	x	x	17 ^D	15 ^A	5 ^A
Navigational, measuring, medical and control instruments	46	45	48 ^D	25 ^A	11 ^A
Other computer and electronic products	2	x	x	1 ^A	x
Electrical equipment, appliance and components	13	20	16 ^D	7 ^A	x
Motor vehicle and parts	459	372	100 ^C	69 ^A	23 ^A
Aerospace products and parts	103	97	59 ^E	6 ^A	x
All other transportation equipment	4	x	11 ^E	x	x
Furniture and related products	4	3	4 ^E	1 ^A	0 ^A
Other manufacturing industries	21	17	22 ^E	8 ^A	4 ^A
Services	1,910	2,172	2,367^A	1,660^A	1,944^A
Wholesale trade	271	283	582 ^A	465 ^A	487 ^A
Retail trade	16	17	19 ^C	4 ^A	7 ^A
Transportation and warehousing	36	63	48 ^C	15 ^A	x
Information and cultural industries	714	706	587 ^A	548 ^A	x
Finance, insurance and real estate	109	127	114 ^C	32 ^A	29 ^A
Architectural, engineering and related services	62	64	60 ^D	44 ^A	25 ^A
Computer system design and related services	150	175	145 ^E	60 ^A	26 ^A
Management, scientific and technical consulting services	18	19	15 ^D	3 ^A	0 ^A
Scientific research and development services	406	580	677 ^B	437 ^A	611 ^A
Health care and social assistance	73	72	43 ^C	30 ^A	x
All other services	54	66	77 ^B	22 ^A	x

Note(s): Components may not add to totals due to rounding.

Table 14-2
Total extramural payments for research and development, by industry and by location of recipient, 2008^p

	Canada	Foreign	Total
	millions of dollars		
Total	2,899^B	892^B	3,790^A
Agriculture, forestry, fishing and hunting	12^E	F	16^E
Agriculture	X	X	9 ^E
Forestry and logging	X	X	F
Fishing, hunting and trapping	X	X	2 ^C
Mining and oil and gas extraction	59^B	F	64^B
Oil and gas extraction	41 ^C	F	45 ^C
Mining	18 ^D	F	19 ^D
Utilities	103^A	3^D	105^A
Electric power	X	X	100 ^A
Other utilities	X	X	6 ^C
Construction	13^E	F	15^D
Manufacturing	1,031^A	193^D	1,223^A
Food	112 ^A	F	115 ^A
Beverage and tobacco	F	F	F
Textile	2 ^D	F	3 ^D
Wood products	19 ^B	F	21 ^B
Paper	12 ^D	F	17 ^D
Printing	X	F	X
Petroleum and coal products	X	X	X
Pharmaceutical and medicine	373 ^A	21 ^D	394 ^A
Other chemicals	20 ^C	F	25 ^C
Plastic products	9 ^A	3 ^C	12 ^A
Rubber products	X	X	5 ^D
Non-metallic mineral products	X	X	5 ^E
Primary metal (ferrous)	X	X	4 ^A
Primary metal (non-ferrous)	31 ^B	4 ^D	36 ^B
Fabricated metal products	21 ^D	F	23 ^D
Machinery	52 ^D	F	55 ^D
Computer and peripheral equipment	F	5 ^E	10 ^D
Communications equipment	143 ^A	19 ^D	162 ^A
Semiconductor and other electronic components	12 ^D	F	17 ^D
Navigational, measuring, medical and control instruments	31 ^D	17 ^E	48 ^D
Other computer and electronic products	X	X	X
Electrical equipment, appliance and components	12 ^D	4 ^D	16 ^D
Motor vehicle and parts	X	X	100 ^C
Aerospace products and parts	X	X	59 ^E
All other transportation equipment	X	X	11 ^E
Furniture and related products	4 ^E	0 ^E	4 ^E
Other manufacturing industries	19 ^E	F	22 ^E
Services	1,682^B	685^B	2,367^A
Wholesale trade	X	X	582 ^A
Retail trade	14 ^C	5 ^E	19 ^C
Transportation and warehousing	34 ^D	14 ^B	48 ^C
Information and cultural industries	519 ^A	69 ^A	587 ^A
Finance, insurance and real estate	101 ^C	F	114 ^C
Architectural, engineering and related services	51 ^D	F	60 ^D
Computer system design and related services	136 ^E	9 ^E	145 ^E
Management, scientific and technical consulting services	X	X	15 ^D
Scientific research and development services	337 ^B	339 ^B	677 ^B
Health care and social assistance	31 ^C	13 ^E	43 ^C
All other services	66 ^B	F	77 ^B

Note(s): Components may not add to totals due to rounding.

Table 15
Foreign receipts and payments for technological services by research and development and other

	Receipts		Total	Payments		Total	Balance		Total
	Research and development	Other		Research and development	Other		Research and development	Other	
millions of dollars									
2008 p	1,983	857	2,840	892	239	1,130	1,091	618	1,710
2007 r	2,411	675	3,086	1,167	271	1,438	1,244	404	1,648
2006 r	2,113	721	2,834	1,054	336	1,390	1,059	385	1,444
2005 r	2,327	754	3,081	1,146	317	1,463	1,181	438	1,618
2004 r	2,280	1,260	3,539	1,127	401	1,528	1,153	859	2,012
2003	2,073	1,509	3,582	1,149	443	1,592	925	1,066	1,991
2002	1,822	1,619	3,441	1,076	684	1,759	747	935	1,682
2001	2,828	1,426	4,255	1,283	364	1,648	1,545	1,062	2,607
2000	3,524	1,144	4,668	1,374	527	1,901	2,150	617	2,767
1999	2,642	320	2,962	1,490	523	2,012	1,152	-202	950
1998	2,499	296	2,795	1,045	694	1,739	1,453	-398	1,056

Note(s): Data are only for firms engaged in research and development over \$1.5 million. Components may not add to totals due to rounding.

Table 16
Energy research and development expenditures, by area of technology and by source of funds, 2008^p

	Intramural research and development expenditures			Payments outside Canada	Total
	Self-funded	Government funded and other sources	Total		
millions of dollars					
Total	1,090	342	1,432	79	1,511
Fossil Fuels	730	209	939	7	946
Renewable energy resources	53	38	91	x	x
Nuclear fission and fusion	x	x	x	0	x
Electric Power	88	19	106	x	x
Hydrogen and fuel cells	x	x	7	0	7
Energy efficiency	114	x	x	x	x
Other	59	13	72	x	x

Note(s): Components may not add to totals due to rounding.

Table 17-1
Research and development performers by industry and by country of control, 2007

	Canada	Foreign	Total
	number		
Total	21,333	981	22,314
Agriculture, forestry, fishing and hunting	963	7	970
Agriculture	829	5	834
Forestry and logging	90	1	91
Fishing, hunting and trapping	44	1	45
Mining and oil and gas extraction	149	30	179
Oil and gas extraction	99	17	116
Mining	50	13	63
Utilities	138	8	146
Electric power	29	3	32
Other utilities	109	5	114
Construction	719	5	724
Manufacturing	8,976	525	9,501
Food	697	29	726
Beverage and tobacco	71	6	77
Textile	169	12	181
Wood products	333	11	344
Paper	119	22	141
Printing	342	5	347
Petroleum and coal products	38	10	48
Pharmaceutical and medicine	102	28	130
Other chemicals	432	53	485
Plastic products	501	33	534
Rubber products	57	10	67
Non-metallic mineral products	234	14	248
Primary metal (ferrous)	57	14	71
Primary metal (non-ferrous)	82	15	97
Fabricated metal products	1,382	39	1,421
Machinery	1,542	57	1,599
Computer and peripheral equipment	81	12	93
Communications equipment	149	13	162
Semiconductor and other electronic components	168	13	181
Navigational, measuring, medical and control instruments	320	20	340
Other computer and electronic products	51	1	52
Electrical equipment, appliance and components	288	29	317
Motor vehicle and parts	306	45	351
Aerospace products and parts	70	14	84
All other transportation equipment	110	5	115
Furniture and related products	384	1	385
Other manufacturing industries	891	14	905
Services	10,388	406	10,794
Wholesale trade	1,903	139	2,042
Retail trade	495	11	506
Transportation and warehousing	189	8	197
Information and cultural industries	744	48	792
Finance, insurance and real estate	313	14	327
Architectural, engineering and related services	906	29	935
Computer system design and related services	2,609	61	2,670
Management, scientific and technical consulting services	437	3	440
Scientific research and development services	913	43	956
Health care and social assistance	214	3	217
All other services	1,665	47	1,712

Table 17-2
Research and development performers by province, 2002 to 2007

	2002	2003	2004	2005	2006 ^f	2007	Absolute change from 2007 to 2002	Change from 2002 to 2007
	number						percent	
Canada - total	13,363	15,728	17,951	19,515	21,142	22,314	8,951	67.0
Total - Multi-province	13,699	16,050	18,275	19,853	22,183	23,436	9,737	71.1
Newfoundland and Labrador	82	104	118	134	142	137	55	67.1
Prince Edward Island	28	34	37	50	55	66	38	135.7
Nova Scotia	218	227	241	255	301	358	140	64.2
New Brunswick	173	200	212	215	253	263	90	52.0
Quebec	5,663	6,444	7,215	7,858	8,682	8,899	3,236	57.1
Ontario	4,928	5,936	6,938	7,675	8,845	9,373	4,445	90.2
Manitoba	320	368	401	409	396	423	103	32.2
Saskatchewan	176	190	211	232	224	267	91	51.7
Alberta	835	1,002	1,172	1,196	1,273	1,372	537	64.3
British Columbia ¹	1,276	1,545	1,730	1,829	2,012	2,278	1,002	78.5

1. Includes Yukon, Northwest Territories and Nunavut.

Note(s): A new imputation system was implemented for reference year 2008. This imputation system incorporated information on firm structure obtained from Statistics Canada's Business Register for all records which were obtained through administrative sources. This change does not impact national totals, but had the effect of increasing the number of units reporting R&D within provinces. Caution should be used when making any comparison of counts of provincial firm with R&D activities.

Table 17-3
Research and development performers as a percentage of enterprises with one or more employees, 2002 to 2007

	2002	2003	2004	2005	2006 ^r	2007
	percent					
Total	1.4	1.6	1.9	2.0	2.2	2.3
Agriculture, forestry, fishing and hunting	0.7	0.9	1.2	1.3	1.6	2.0
Agriculture	0.7	1.0	1.3	1.6	1.9	2.4
Forestry and logging	0.4	0.5	0.7	0.7	0.8	1.1
Fishing, hunting and trapping	0.6	0.8	0.8	0.7	0.8	0.8
Mining and oil and gas extraction	1.5	1.9	2.1	2.2	2.3	2.1
Oil and gas extraction	1.1	1.3	1.5	1.7	1.9	1.7
Mining	3.3	4.3	4.5	4.3	4.0	3.8
Utilities	1.9	2.3	3.0	3.5	4.2	4.2
Electric power	3.2	2.8	3.5	4.1	5.3	6.8
Other utilities	1.7	2.3	2.9	3.4	4.0	3.8
Construction	0.3	0.4	0.5	0.5	0.5	0.6
Manufacturing	10.2	12.4	14.7	16.3	17.5	18.1
Food	6.9	9.0	11.0	12.4	13.8	13.9
Beverage and tobacco	5.4	5.9	7.6	10.0	12.7	12.5
Textile	8.5	10.3	11.2	11.8	13.7	12.8
Wood products	5.1	6.6	7.8	8.3	9.4	9.4
Paper	15.9	20.0	22.8	22.7	22.9	24.0
Printing	2.4	3.6	5.0	5.7	6.4	8.0
Petroleum and coal products	15.7	21.1	35.9	35.9	33.3	31.4
Pharmaceutical and medicine	40.6	43.5	50.0	50.0	50.6	49.1
Other chemicals	22.0	24.5	27.6	30.3	32.8	32.6
Plastic products	17.9	22.7	26.7	29.0	32.5	30.7
Rubber products	16.8	17.9	20.8	24.7	24.6	24.4
Non-metallic mineral products	6.7	8.5	10.0	11.8	12.7	13.3
Primary metal (ferrous)	16.8	23.1	23.9	26.1	21.0	21.8
Primary metal (non-ferrous)	19.6	25.2	26.5	31.3	36.7	34.9
Fabricated metal products	9.1	11.6	14.5	16.1	17.2	18.0
Machinery	20.4	23.5	27.5	29.8	30.8	31.7
Computer and peripheral equipment	31.5	31.4	32.6	34.5	37.0	37.7
Communications equipment	47.7	51.8	56.9	56.2	55.7	57.2
Semiconductor and other electronic components	31.2	33.5	38.9	38.4	41.9	42.9
Navigational, measuring, medical and control instruments	32.0	36.1	38.0	42.6	44.2	45.3
Other computer and electronic products	17.6	21.8	26.2	26.2	28.3	27.8
Electrical equipment, appliance and components	20.2	21.7	25.1	28.3	28.8	29.5
Motor vehicle and parts	14.6	17.8	20.6	23.3	25.5	27.1
Aerospace products and parts	26.3	34.4	40.1	34.9	38.5	36.1
All other transportation equipment	10.4	14.2	16.0	17.7	19.9	20.6
Furniture and related products	4.0	5.2	6.4	7.3	8.2	9.0
Other manufacturing industries	4.9	6.5	8.1	9.7	10.7	11.3
Services	0.9	1.0	1.2	1.3	1.3	1.4
Wholesale trade	1.9	2.2	2.8	3.0	3.5	4.0
Retail trade	0.2	0.3	0.3	0.4	0.4	0.5
Transportation and warehousing	0.2	0.3	0.3	0.3	0.3	0.5
Information and cultural industries	4.1	4.8	5.2	5.9	6.3	7.2
Finance, insurance and real estate	0.2	0.3	0.4	0.4	0.4	0.5
Architectural, engineering and related services	3.9	4.6	5.3	5.1	4.9	5.3
Computer system design and related services	9.1	10.2	11.0	11.0	10.9	12.2
Management, scientific and technical consulting services	1.6	1.6	1.6	1.7	1.5	1.8
Scientific research and development services	27.2	31.6	38.4	37.4	37.2	39.8
Health care and social assistance	0.1	0.2	0.2	0.2	0.2	0.3
All other services	0.3	0.3	0.4	0.4	0.5	0.5

Note(s): Components may not add to totals due to rounding.

Table 17-4
Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Total, all industries		22,314
Agriculture, Forestry, Fishing and Hunting		970
Agriculture		834
Soybean Farming	111110	2
Oilseed (except Soybean) Farming	111120	1
Dry Pea and Bean Farming	111130	3
Wheat Farming	111140	7
Corn Farming	111150	10
Rice Farming	111160	0
Other Grain Farming	111190	25
Potato Farming	111211	37
Other Vegetable (except Potato) and Melon Farming	111219	76
Orange Groves	111310	0
Citrus (except Orange) Groves	111320	0
Non-Citrus Fruit and Tree Nut Farming	111330	60
Mushroom Production	111411	13
Other Food Crops Grown Under Cover	111419	32
Nursery and Tree Production	111421	48
Floriculture Production	111422	99
Tobacco Farming	111910	14
Cotton Farming	111920	0
Sugar-Cane Farming	111930	0
Hay Farming	111940	4
Fruit and Vegetable Combination Farming	111993	16
Mayle Syrup and Products Production	111994	8
All Other Miscellaneous Crop Farming	111999	39
Beef Cattle Ranching and Farming, including Feedlots	112110	17
Dairy Cattle and Milk Production	112120	81
Hog and Pig Farming	112210	65
Chicken Egg Production	112310	6
Broiler and Other Meat-Type Chicken Production	112320	19
Turkey Production	112330	0
Poultry Hatcheries	112340	4
Combination Poultry and Egg Production	112391	5
All Other Poultry Production	112399	3
Sheep Farming	112410	3
Goat Farming	112420	2
Apiculture	112910	8
Horse and Other Equine Production	112920	1
Fur-Bearing Animal and Rabbit Production	112930	16
Livestock Combination Farming	112991	43
All Other Miscellaneous Animal Production	112999	4
Support Activities for Crop Production	115110	38
Support Activities for Animal Production	115210	25
Forestry and Logging		91
Timber Tract Operations	113110	4
Forest Nurseries and Gathering of Forest Products	113210	10
Logging (except Contract)	113311	18
Contract Logging	113312	28
Support Activities for Forestry	115310	31
Fishing, Hunting and Trapping		45
Aquaculture	112510	32
Salt Water Fishing	114113	12
Inland Fishing	114114	1
Hunting and Trapping	114210	0
Mining and Oil and Gas Extraction		179
Oil and Gas Extraction		116
Conventional Oil and Gas Extraction	211113	37
Non-Conventional Oil Extraction	211114	8
Oil and Gas Contract Drilling	213111	8
Services to Oil and Gas Extraction	213118	63
Mining		63
Bituminous Coal Mining	212114	0
Subbituminous Coal Mining	212115	0
Lignite Coal Mining	212116	0

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Iron Ore Mining	212210	4
Gold and Silver Ore Mining	212220	5
Lead-Zinc Ore Mining	212231	0
Nickel-Copper Ore Mining	212232	0
Copper-Zinc Ore Mining	212233	1
Uranium Ore Mining	212291	0
All Other Metal Ore Mining	212299	1
Granite Mining and Quarrying	212314	3
Limestone Mining and Quarrying	212315	5
Marble Mining and Quarrying	212316	3
Sandstone Mining and Quarrying	212317	0
Sand and Gravel Mining and Quarrying	212323	4
Shale, Clay and Refractory Mineral Mining and Quarrying	212326	2
Diamond Mines	212392	1
Salt Mines	212393	0
Asbestos Mining	212394	0
Gypsum Mining	212395	0
Potash Mining	212396	2
Peat Extraction	212397	8
All Other Non-Metallic Mineral Mining and Quarrying	212398	2
Contract Drilling (except Oil and Gas)	213117	2
Other Support Activities for Mining	213119	20
Utilities		146
Electric Power		32
Hydro-Electric Power Generation	221111	12
Fossil-Fuel Electric Power Generation	221112	4
Nuclear Electric Power Generation	221113	0
Other Electric Power Generation	221119	9
Electric Bulk Power Transmission and Control	221121	2
Electric Power Distribution	221122	5
Other Utilities		114
Natural Gas Distribution	221210	5
Water Supply and Irrigation Systems	221310	24
Sewage Treatment Facilities	221320	2
Steam and Air-Conditioning Supply	221330	0
Waste Collection	562110	12
Waste Treatment and Disposal	562210	26
Remediation Services	562910	24
Material Recovery Facilities	562920	7
All Other Waste Management Services	562990	14
Construction		724
Residential Building Construction	236110	76
Industrial Building and Structure Construction	236210	17
Commercial and Institutional Building Construction	236220	26
Water and Sewer Line and Related Structures Construction	237110	24
Oil and Gas Pipeline and Related Structures Construction	237120	11
Power and Communication Line and Related Structures Construction	237130	11
Land Subdivision	237210	10
Highway, Street and Bridge Construction	237310	42
Other Heavy and Civil Engineering Construction	237990	18
Poured Concrete Foundation and Structure Contractors	238110	11
Structural Steel and Precast Concrete Contractors	238120	17
Framing Contractors	238130	2
Masonry Contractors	238140	10
Glass and Glazing Contractors	238150	8
Roofing Contractors	238160	10
Siding Contractors	238170	8
Other Foundation, Structure and Building Exterior Contractors	238190	17
Electrical Contractors and Other Wiring Installation Contractors	238210	97
Plumbing, Heating and Air-Conditioning Contractors	238220	95
Elevator and Escalator Installation Contractors	238291	2
All Other Building Equipment Contractors	238299	42
Drywall and Insulation Contractors	238310	5
Painting and Wall Covering Contractors	238320	18
Flooring Contractors	238330	15
Tile and Terrazzo Contractors	238340	9
Finish Carpentry Contractors	238350	45
Other Building Finishing Contractors	238390	7
Site Preparation Contractors	238910	43

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
All Other Specialty Trade Contractors	238990	28
Manufacturing		9,501
Food		726
Dog and Cat Food Manufacturing	311111	9
Other Animal Food Manufacturing	311119	59
Flour Milling	311211	8
Rice Milling and Malt Manufacturing	311214	5
Wet Corn Milling	311221	1
Oilseed Processing	311224	5
Fat and Oil Refining and Blending	311225	2
Breakfast Cereal Manufacturing	311230	7
Sugar Manufacturing	311310	5
Chocolate and Confectionery Manufacturing from Cacao Beans	311320	5
Confectionery Manufacturing from Purchased Chocolate	311330	7
Non-Chocolate Confectionery Manufacturing	311340	13
Frozen Food Manufacturing	311410	29
Fruit and Vegetable Canning, Pickling and Drying	311420	57
Fluid Milk Manufacturing	311511	10
Butter, Cheese, and Dry and Condensed Dairy Product Manufacturing	311515	56
Ice Cream and Frozen Dessert Manufacturing	311520	9
Animal (except Poultry) Slaughtering	311611	18
Rendering and Meat Processing from Carcasses	311614	43
Poultry Processing	311615	24
Seafood Product Preparation and Packaging	311710	43
Retail Bakeries	311811	32
Commercial Bakeries and Frozen Bakery Product Manufacturing	311814	104
Cookie and Cracker Manufacturing	311821	18
Flour Mixes and Dough Manufacturing from Purchased Flour	311822	13
Dry Pasta Manufacturing	311823	9
Tortilla Manufacturing	311830	1
Roasted Nut and Peanut Butter Manufacturing	311911	5
Other Snack Food Manufacturing	311919	5
Coffee and Tea Manufacturing	311920	12
Flavouring Syrup and Concentrate Manufacturing	311930	8
Seasoning and Dressing Manufacturing	311940	23
All Other Food Manufacturing	311990	81
Beverages and Tobacco		77
Soft Drink and Ice Manufacturing	312110	9
Breweries	312120	24
Wineries	312130	38
Distilleries	312140	3
Tobacco Stemming and Redrying	312210	0
Tobacco Product Manufacturing	312220	3
Textile		181
Fibre, Yarn and Thread Mills	313110	12
Broad-Woven Fabric Mills	313210	19
Narrow Fabric Mills and Schiffli Machine Embroidery	313220	5
Nonwoven Fabric Mills	313230	9
Knit Fabric Mills	313240	21
Textile and Fabric Finishing	313310	26
Fabric Coating	313320	10
Carpet and Rug Mills	314110	12
Curtain and Linen Mills	314120	14
Textile Bag and Canvas Mills	314910	26
All Other Textile Product Mills	314990	27
Wood Products		344
Sawmills (except Shingle and Shake Mills)	321111	65
Shingle and Shake Mills	321112	8
Wood Preservation	321114	11
Hardwood Veneer and Plywood Mills	321211	12
Softwood Veneer and Plywood Mills	321212	3
Structural Wood Product Manufacturing	321215	18
Particle Board and Fibreboard Mills	321216	6
Waferboard Mills	321217	4
Wood Window and Door Manufacturing	321911	58
Other Millwork	321919	71
Wood Container and Pallet Manufacturing	321920	27
Manufactured (Mobile) Home Manufacturing	321991	6

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Prefabricated Wood Building Manufacturing	321992	13
All Other Miscellaneous Wood Product Manufacturing	321999	42
Paper		141
Mechanical Pulp Mills	322111	1
Chemical Pulp Mills	322112	8
Paper (except Newsprint) Mills	322121	8
Newsprint Mills	322122	5
Paperboard Mills	322130	8
Corrugated and Solid Fibre Box Manufacturing	322211	26
Folding Paperboard Box Manufacturing	322212	14
Other Paperboard Container Manufacturing	322219	8
Paper Bag and Coated and Treated Paper Manufacturing	322220	32
Stationery Product Manufacturing	322230	7
Sanitary Paper Product Manufacturing	322291	7
All Other Converted Paper Product Manufacturing	322299	17
Printing		347
Commercial Screen Printing	323113	38
Quick Printing	323114	7
Digital Printing	323115	12
Manifold Business Forms Printing	323116	19
Other Printing	323119	222
Support Activities for Printing	323120	49
Petroleum and Coal Products		48
Petroleum Refineries	324110	13
Asphalt Paving Mixture and Block Manufacturing	324121	6
Asphalt Shingle and Coating Material Manufacturing	324122	6
Other Petroleum and Coal Product Manufacturing	324190	23
Pharmaceutical and Medicine		130
Pharmaceutical and Medicine Manufacturing	325410	130
Other Chemical		485
Petrochemical Manufacturing	325110	4
Industrial Gas Manufacturing	325120	2
Synthetic Dye and Pigment Manufacturing	325130	15
Alkali and Chlorine Manufacturing	325181	0
All Other Basic Inorganic Chemical Manufacturing	325189	20
Other Basic Organic Chemical Manufacturing	325190	27
Resin and Synthetic Rubber Manufacturing	325210	31
Artificial and Synthetic Fibres and Filaments Manufacturing	325220	7
Chemical Fertilizer (except Potash) Manufacturing	325313	11
Mixed Fertilizer Manufacturing	325314	21
Pesticide and Other Agricultural Chemical Manufacturing	325320	8
Paint and Coating Manufacturing	325510	72
Adhesive Manufacturing	325520	22
Soap and Cleaning Compound Manufacturing	325610	54
Toilet Preparation Manufacturing	325620	62
Printing Ink Manufacturing	325910	19
Explosives Manufacturing	325920	4
Custom Compounding of Purchased Resins	325991	15
All Other Miscellaneous Chemical Product Manufacturing	325999	91
Plastic Product		534
Plastic Bag and Pouch Manufacturing	326111	36
Plastic Film and Sheet Manufacturing	326114	28
Unlaminated Plastic Profile Shape Manufacturing	326121	35
Plastic Pipe and Pipe Fitting Manufacturing	326122	18
Laminated Plastic Plate, Sheet (except Packaging) and Shape Manufacturing	326130	12
Polystyrene Foam Product Manufacturing	326140	20
Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	24
Plastic Bottle Manufacturing	326160	14
Plastic Plumbing Fixture Manufacturing	326191	17
Motor Vehicle Plastic Parts Manufacturing	326193	52
Plastic Window and Door Manufacturing	326196	31
All Other Plastic Product Manufacturing	326198	247
Rubber Product		67
Tire Manufacturing	326210	6
Rubber and Plastic Hose and Belting Manufacturing	326220	12
Other Rubber Product Manufacturing	326290	49

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Non-Metallic Mineral Products		248
Pottery, Ceramics and Plumbing Fixture Manufacturing	327110	5
Clay Building Material and Refractory Manufacturing	327120	16
Glass Manufacturing	327214	14
Glass Product Manufacturing from Purchased Glass	327215	34
Cement Manufacturing	327310	4
Ready-Mix Concrete Manufacturing	327320	17
Concrete Pipe, Brick and Block Manufacturing	327330	35
Other Concrete Product Manufacturing	327390	42
Lime Manufacturing	327410	4
Gypsum Product Manufacturing	327420	12
Abrasive Product Manufacturing	327910	10
All Other Non-Metallic Mineral Product Manufacturing	327990	55
Primary Metal (Ferrous)		71
Iron and Steel Mills and Ferro-Alloy Manufacturing	331110	11
Iron and Steel Pipes and Tubes Manufacturing from Purchased Steel	331210	13
Cold-Rolled Steel Shape Manufacturing	331221	3
Steel Wire Drawing	331222	5
Iron Foundries	331511	28
Steel Foundries	331514	11
Primary Metal (Non-Ferrous)		97
Primary Production of Alumina and Aluminum	331313	10
Aluminum Rolling, Drawing, Extruding and Alloying	331317	17
Non-Ferrous Metal (except Aluminum) Smelting and Refining	331410	15
Copper Rolling, Drawing, Extruding and Alloying	331420	7
Non-Ferrous Metal (except Copper and Aluminum) Rolling, Drawing, Extruding and Alloying	331490	13
Non-Ferrous Die-Casting Foundries	331523	17
Non-Ferrous Foundries (except Die-Casting)	331529	18
Fabricated Metal Product		1,421
Forging	332113	33
Stamping	332118	71
Cutlery and Hand Tool Manufacturing	332210	51
Prefabricated Metal Building and Component Manufacturing	332311	22
Concrete Reinforcing Bar Manufacturing	332314	2
Other Plate Work and Fabricated Structural Product Manufacturing	332319	95
Metal Window and Door Manufacturing	332321	73
Other Ornamental and Architectural Metal Product Manufacturing	332329	101
Power Boiler and Heat Exchanger Manufacturing	332410	19
Metal Tank (Heavy Gauge) Manufacturing	332420	33
Metal Can Manufacturing	332431	3
Other Metal Container Manufacturing	332439	28
Hardware Manufacturing	332510	32
Spring (Heavy Gauge) Manufacturing	332611	3
Other Fabricated Wire Product Manufacturing	332619	32
Machine Shops	332710	502
Turned Product and Screw, Nut and Bolt Manufacturing	332720	36
Coating, Engraving, Heat Treating and Allied Activities	332810	138
Metal Valve Manufacturing	332910	28
Ball and Roller Bearing Manufacturing	332991	6
All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	113
Machinery		1,599
Agricultural Implement Manufacturing	333110	105
Construction Machinery Manufacturing	333120	53
Mining and Oil and Gas Field Machinery Manufacturing	333130	66
Sawmill and Woodworking Machinery Manufacturing	333210	35
Rubber and Plastics Industry Machinery Manufacturing	333220	39
Paper Industry Machinery Manufacturing	333291	18
All Other Industrial Machinery Manufacturing	333299	136
Commercial and Service Industry Machinery Manufacturing	333310	120
Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing	333413	46
Heating Equipment and Commercial Refrigeration Equipment Manufacturing	333416	95
Industrial Mould Manufacturing	333511	145
Other Metalworking Machinery Manufacturing	333519	316
Turbine and Turbine Generator Set Unit Manufacturing	333611	17
Other Engine and Power Transmission Equipment Manufacturing	333619	29
Pump and Compressor Manufacturing	333910	37

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Material Handling Equipment Manufacturing	333920	141
All Other General-Purpose Machinery Manufacturing	333990	201
Computer and Peripheral Equipment		93
Computer and Peripheral Equipment Manufacturing	334110	93
Communications Equipment		162
Telephone Apparatus Manufacturing	334210	33
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	78
Other Communications Equipment Manufacturing	334290	51
Semiconductor and Other Electronic Component		181
Semiconductor and Other Electronic Component Manufacturing	334410	181
Navigational, Measuring, Medical and Control Instruments		340
Navigational and Guidance Instruments Manufacturing	334511	44
Measuring, Medical and Controlling Devices Manufacturing	334512	296
Other Computer and Electronic Product		52
Audio and Video Equipment Manufacturing	334310	36
Manufacturing and Reproducing Magnetic and Optical Media	334610	16
Electrical Equipment, Appliance and Component		317
Electric Lamp Bulb and Parts Manufacturing	335110	4
Lighting Fixture Manufacturing	335120	47
Small Electrical Appliance Manufacturing	335210	20
Major Kitchen Appliance Manufacturing	335223	9
Other Major Appliance Manufacturing	335229	5
Power, Distribution and Specialty Transformers Manufacturing	335311	28
Motor and Generator Manufacturing	335312	19
Switchgear and Switchboard, and Relay and Industrial Control Apparatus Manufacturing	335315	62
Battery Manufacturing	335910	7
Communication and Energy Wire and Cable Manufacturing	335920	29
Wiring Device Manufacturing	335930	15
All Other Electrical Equipment and Component Manufacturing	335990	72
Motor Vehicle and Parts		351
Automobile and Light-Duty Motor Vehicle Manufacturing	336110	11
Heavy-Duty Truck Manufacturing	336120	14
Motor Vehicle Body Manufacturing	336211	39
Truck Trailer Manufacturing	336212	38
Motor Home, Travel Trailer and Camper Manufacturing	336215	19
Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	30
Motor Vehicle Electrical and Electronic Equipment Manufacturing	336320	30
Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	10
Motor Vehicle Brake System Manufacturing	336340	17
Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	12
Motor Vehicle Seating and Interior Trim Manufacturing	336360	18
Motor Vehicle Metal Stamping	336370	33
Other Motor Vehicle Parts Manufacturing	336390	80
Aerospace Product and Parts		84
Aerospace Product and Parts Manufacturing	336410	84
All Other Transportation Equipment		115
Railroad Rolling Stock Manufacturing	336510	6
Ship Building and Repairing	336611	9
Boat Building	336612	54
Other Transportation Equipment Manufacturing	336990	46
Furniture and Related Product		385
Wood Kitchen Cabinet and Counter Top Manufacturing	337110	71
Upholstered Household Furniture Manufacturing	337121	26
Other Wood Household Furniture Manufacturing	337123	83
Household Furniture (except Wood and Upholstered) Manufacturing	337126	19
Institutional Furniture Manufacturing	337127	47
Wood Office Furniture, including Custom Architectural Woodwork, Manufacturing	337213	32
Office Furniture (except Wood) Manufacturing	337214	26
Showcase, Partition, Shelving and Locker Manufacturing	337215	56
Mattress Manufacturing	337910	14
Blind and Shade Manufacturing	337920	11
Other Manufacturing Industries		905
Hosiery and Sock Mills	315110	6

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Other Clothing Knitting Mills	315190	15
Cut and Sew Clothing Contracting	315210	26
Men's and Boys' Cut and Sew Underwear and Nightwear Manufacturing	315221	3
Men's and Boys' Cut and Sew Suit, Coat and Overcoat Manufacturing	315222	8
Men's and Boys' Cut and Sew Shirt Manufacturing	315226	7
Men's and Boys' Cut and Sew Trouser, Slack and Jean Manufacturing	315227	5
Other Men's and Boys' Cut and Sew Clothing Manufacturing	315229	18
Women's and Girls' Cut and Sew Lingerie, Loungewear and Nightwear Manufacturing	315231	18
Women's and Girls' Cut and Sew Blouse and Shirt Manufacturing	315232	7
Women's and Girls' Cut and Sew Dress Manufacturing	315233	13
Women's and Girls' Cut and Sew Suit, Coat, Tailored Jacket and Skirt Manufacturing	315234	13
Other Women's and Girls' Cut and Sew Clothing Manufacturing	315239	26
Infants' Cut and Sew Clothing Manufacturing	315291	2
Fur and Leather Clothing Manufacturing	315292	30
All Other Cut and Sew Clothing Manufacturing	315299	9
Clothing Accessories and Other Clothing Manufacturing	315990	23
Leather and Hide Tanning and Finishing	316110	8
Footwear Manufacturing	316210	14
Other Leather and Allied Product Manufacturing	316990	16
Medical Equipment and Supplies Manufacturing	339110	174
Jewellery and Silverware Manufacturing	339910	30
Sporting and Athletic Goods Manufacturing	339920	91
Doll, Toy and Game Manufacturing	339930	28
Office Supplies (except Paper) Manufacturing	339940	16
Sign Manufacturing	339950	44
All Other Miscellaneous Manufacturing	339990	255
Services		10,794
Wholesale Trade		2,042
Live Animal Wholesaler-Distributors	411110	7
Oilseed and Grain Wholesaler-Distributors	411120	6
Nursery Stock and Plant Wholesaler-Distributors	411130	21
Other Farm Product Wholesaler-Distributors	411190	6
Petroleum Product Wholesaler-Distributors	412110	16
General-Line Food Wholesaler-Distributors	413110	22
Dairy and Milk Products Wholesaler-Distributors	413120	6
Poultry and Egg Wholesaler-Distributors	413130	6
Fish and Seafood Product Wholesaler-Distributors	413140	10
Fresh Fruit and Vegetable Wholesaler-Distributors	413150	38
Red Meat and Meat Product Wholesaler-Distributors	413160	35
Other Specialty-Line Food Wholesaler-Distributors	413190	93
Non-Alcoholic Beverage Wholesaler-Distributors	413210	8
Alcoholic Beverage Wholesaler-Distributors	413220	4
Cigarette and Tobacco Product Wholesaler-Distributors	413310	0
Clothing and Clothing Accessories Wholesaler-Distributors	414110	70
Footwear Wholesaler-Distributors	414120	6
Piece Goods, Notions and Other Dry Goods Wholesaler-Distributors	414130	28
Home Entertainment Equipment Wholesaler-Distributors	414210	8
Household Appliance Wholesaler-Distributors	414220	13
China, Glassware, Crockery and Pottery Wholesaler-Distributors	414310	2
Floor Covering Wholesaler-Distributors	414320	3
Linen, Drapery and Other Textile Furnishings Wholesaler-Distributors	414330	2
Other Home Furnishings Wholesaler-Distributors	414390	22
Jewellery and Watch Wholesaler-Distributors	414410	4
Book, Periodical and Newspaper Wholesaler-Distributors	414420	7
Photographic Equipment and Supplies Wholesaler-Distributors	414430	6
Sound Recording Wholesalers	414440	1
Video Cassette Wholesalers	414450	0
Toy and Hobby Goods Wholesaler-Distributors	414460	11
Amusement and Sporting Goods Wholesaler-Distributors	414470	16
Pharmaceuticals and Pharmacy Supplies Wholesaler-Distributors	414510	49
Toiletries, Cosmetics and Sundries Wholesaler-Distributors	414520	34
New and Used Automobile and Light-Duty Truck Wholesaler-Distributors	415110	3
Truck, Truck Tractor and Bus Wholesaler-Distributors	415120	8
Recreational and Other Motor Vehicles Wholesaler-Distributors	415190	5

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Tire Wholesaler-Distributors	415210	0
Other New Motor Vehicle Parts and Accessories Wholesaler-Distributors	415290	45
Used Motor Vehicle Parts and Accessories Wholesaler-Distributors	415310	3
Electrical Wiring and Construction Supplies Wholesaler-Distributors	416110	38
Plumbing, Heating and Air-Conditioning Equipment and Supplies Wholesaler-Distributors	416120	58
Metal Service Centres	416210	45
General-Line Building Supplies Wholesaler-Distributors	416310	10
Lumber, Plywood and Millwork Wholesaler-Distributors	416320	28
Hardware Wholesaler-Distributors	416330	28
Paint, Glass and Wallpaper Wholesaler-Distributors	416340	15
Other Specialty-Line Building Supplies Wholesaler-Distributors	416390	39
Farm, Lawn and Garden Machinery and Equipment Wholesaler-Distributors	417110	38
Construction and Forestry Machinery, Equipment and Supplies Wholesaler-Distributors	417210	27
Mining and Oil and Gas Well Machinery, Equipment and Supplies Wholesaler-Distributors	417220	17
Industrial Machinery, Equipment and Supplies Wholesaler-Distributors	417230	208
Computer, Computer Peripheral and Pre-Packaged Software Wholesaler-Distributors	417310	123
Electronic Components, Navigational and Communications Equipment and Supplies Wholesaler-Distributors	417320	90
Office and Store Machinery and Equipment Wholesaler-Distributors	417910	39
Service Establishment Machinery, Equipment and Supplies Wholesaler-Distributors	417920	31
Professional Machinery, Equipment and Supplies Wholesaler-Distributors	417930	94
All Other Machinery, Equipment and Supplies Wholesaler-Distributors	417990	53
Recyclable Metal Wholesaler-Distributors	418110	17
Recyclable Paper and Paperboard Wholesaler-Distributors	418120	2
Other Recyclable Material Wholesaler-Distributors	418190	41
Stationery and Office Supplies Wholesaler-Distributors	418210	4
Other Paper and Disposable Plastic Product Wholesaler-Distributors	418220	15
Agricultural Feed Wholesaler-Distributors	418310	29
Seed Wholesaler-Distributors	418320	15
Agricultural Chemical and Other Farm Supplies Wholesaler-Distributors	418390	24
Chemical (except Agricultural) and Allied Product Wholesaler-Distributors	418410	73
Log and Wood Chip Wholesaler-Distributors	418910	7
Mineral, Ore and Precious Metal Wholesaler-Distributors	418920	0
Second-Hand Goods (except Machinery and Automotive) Wholesaler-Distributors	418930	1
All Other Wholesaler-Distributors	418990	115
Business-to-Business Electronic Markets	419110	2
Wholesale Trade Agents and Brokers	419120	92
Retail Trade		506
New Car Dealers	441110	3
Used Car Dealers	441120	10
Recreational Vehicle Dealers	441210	1
Motorcycle, Boat and Other Motor Vehicle Dealers	441220	17
Automotive Parts and Accessories Stores	441310	18
Tire Dealers	441320	2
Furniture Stores	442110	9
Floor Covering Stores	442210	1
Window Treatment Stores	442291	4
Print and Picture Frame Stores	442292	1
All Other Home Furnishings Stores	442298	6
Appliance, Television and Other Electronics Stores	443110	28
Computer and Software Stores	443120	69

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Camera and Photographic Supplies Stores	443130	3
Home Centres	444110	4
Paint and Wallpaper Stores	444120	4
Hardware Stores	444130	8
Other Building Material Dealers	444190	23
Outdoor Power Equipment Stores	444210	1
Nursery and Garden Centres	444220	12
Supermarkets and Other Grocery (except Convenience) Stores	445110	11
Convenience Stores	445120	1
Meat Markets	445210	26
Fish and Seafood Markets	445220	4
Fruit and Vegetable Markets	445230	5
Baked Goods Stores	445291	26
Confectionery and Nut Stores	445292	5
All Other Specialty Food Stores	445299	15
Beer, Wine and Liquor Stores	445310	1
Pharmacies and Drug Stores	446110	8
Cosmetics, Beauty Supplies and Perfume Stores	446120	8
Optical Goods Stores	446130	2
Food (Health) Supplement Stores	446191	7
All Other Health and Personal Care Stores	446199	13
Gasoline Stations with Convenience Stores	447110	1
Other Gasoline Stations	447190	3
Men's Clothing Stores	448110	1
Women's Clothing Stores	448120	3
Children's and Infants' Clothing Stores	448130	2
Family Clothing Stores	448140	5
Clothing Accessories Stores	448150	0
Fur Stores	448191	1
All Other Clothing Stores	448199	7
Shoe Stores	448210	4
Jewellery Stores	448310	6
Luggage and Leather Goods Stores	448320	0
Sporting Goods Stores	451110	18
Hobby, Toy and Game Stores	451120	3
Sewing, Needlework and Piece Goods Stores	451130	1
Musical Instrument and Supplies Stores	451140	2
Book Stores and News Dealers	451210	1
Pre-Recorded Tape, Compact Disc and Record Stores	451220	1
Department Stores	452110	0
Warehouse Clubs and Superstores	452910	0
Home and Auto Supplies Stores	452991	0
All Other Miscellaneous General Merchandise Stores	452999	7
Florists	453110	1
Office Supplies and Stationery Stores	453210	0
Gift, Novelty and Souvenir Stores	453220	3
Used Merchandise Stores	453310	0
Pet and Pet Supplies Stores	453910	6
Art Dealers	453920	0
Manufactured (Mobile) Home Dealers	453930	0
Beer and Wine-Making Supplies Stores	453992	5
All Other Miscellaneous Store Retailers (except Beer and Wine-Making Supplies Stores)	453999	31
Internet Shopping	454111	11
Electronic Auctions	454112	2
Mail-Order Houses	454113	14
Vending Machine Operators	454210	2
Heating Oil Dealers	454311	0
Liquefied Petroleum Gas (Bottled Gas) Dealers	454312	1
Other Fuel Dealers	454319	0
Other Direct Selling Establishments	454390	8
Transportation and Warehousing		197
Scheduled Air Transportation	481110	2
Non-Scheduled Chartered Air Transportation	481214	6
Non-Scheduled Specialty Flying Services	481215	6
Short-Haul Freight Rail Transportation	482112	0
Mainline Freight Rail Transportation	482113	0

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Passenger Rail Transportation	482114	1
Deep Sea, Coastal and Great Lakes Water Transportation (except by Ferries)	483115	2
Deep Sea, Coastal and Great Lakes Water Transportation by Ferries	483116	0
Inland Water Transportation (except by Ferries)	483213	0
Inland Water Transportation by Ferries	483214	0
General Freight Trucking, Local	484110	11
General Freight Trucking, Long Distance, Truck-Load	484121	15
General Freight Trucking, Long Distance, Less Than Truck-Load	484122	0
Used Household and Office Goods Moving	484210	3
Bulk Liquids Trucking, Local	484221	1
Dry Bulk Materials Trucking, Local	484222	8
Forest Products Trucking, Local	484223	3
Other Specialized Freight (except Used Goods) Trucking, Local	484229	2
Bulk Liquids Trucking, Long Distance	484231	1
Dry Bulk Materials Trucking, Long Distance	484232	3
Forest Products Trucking, Long Distance	484233	2
Other Specialized Freight (except Used Goods) Trucking, Long Distance	484239	6
Urban Transit Systems	485110	1
Interurban and Rural Bus Transportation	485210	0
Taxi Service	485310	0
Limousine Service	485320	0
School and Employee Bus Transportation	485410	2
Charter Bus Industry	485510	2
Other Transit and Ground Passenger Transportation	485990	1
Pipeline Transportation of Crude Oil	486110	0
Pipeline Transportation of Natural Gas	486210	2
Pipeline Transportation of Refined Petroleum Products	486910	0
All Other Pipeline Transportation	486990	0
Scenic and Sightseeing Transportation, Land	487110	0
Scenic and Sightseeing Transportation, Water	487210	0
Scenic and Sightseeing Transportation, Other	487990	1
Air Traffic Control	488111	0
Other Airport Operations	488119	2
Other Support Activities for Air Transportation	488190	21
Support Activities for Rail Transportation	488210	4
Port and Harbour Operations	488310	1
Marine Cargo Handling	488320	0
Marine Salvage Services	488331	0
Ship Piloting Services	488332	0
Other Navigational Services to Shipping	488339	0
Other Support Activities for Water Transportation	488390	3
Motor Vehicle Towing	488410	1
Other Support Activities for Road Transportation	488490	7
Marine Shipping Agencies	488511	0
Other Freight Transportation Arrangement	488519	18
Other Support Activities for Transportation	488990	2
Postal Service	491110	1
Couriers	492110	4
Local Messengers and Local Delivery	492210	2
General Warehousing and Storage	493110	32
Refrigerated Warehousing and Storage	493120	7
Farm Product Warehousing and Storage	493130	3
Other Warehousing and Storage	493190	8
Information and Cultural Industries		792
Newspaper Publishers	511110	4
Periodical Publishers	511120	3
Book Publishers	511130	10
Database and Directory Publishers	511140	9
Other Publishers	511190	2
Software Publishers	511210	410
Motion Picture and Video Production	512110	32
Motion Picture and Video Distribution	512120	1
Motion Picture and Video Exhibition	512130	1
Post-Production and Other Motion Picture and Video Industries	512190	20
Record Production	512210	0
Integrated Record Production/Distribution	512220	1
Music Publishers	512230	0

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Sound Recording Studios	512240	1
Other Sound Recording Industries	512290	0
Radio Broadcasting	515110	1
Television Broadcasting	515120	5
Pay and Specialty Television	515210	1
Wired Telecommunications Carriers (except Cable)	517111	26
Cable and Other Program Distribution	517112	13
Wireless Telecommunications Carriers (except Satellite)	517210	22
Satellite Telecommunications	517410	15
Other Telecommunications	517910	68
Data Processing, Hosting, and Related Services	518210	75
News Syndicates	519110	2
Libraries	519121	0
Archives	519122	0
Internet Publishing and Broadcasting, and Web Search Portals	519130	54
All Other Information Services	519190	16
Finance, Insurance and Real Estate		327
Monetary Authorities - Central Bank	521110	0
Personal and Commercial Banking Industry	522111	4
Corporate and Institutional Banking Industry	522112	3
Local Credit Unions	522130	1
Other Depository Credit Intermediation	522190	0
Credit Card Issuing	522210	1
Sales Financing	522220	3
Consumer Lending	522291	1
All Other Non-Depository Credit Intermediation	522299	11
Mortgage and Non-mortgage Loan Brokers	522310	2
Central Credit Unions	522321	3
Other Financial Transactions Processing and Clearing House Activities	522329	7
Other Activities Related to Credit Intermediation	522390	0
Investment Banking and Securities Dealing	523110	3
Securities Brokerage	523120	8
Commodity Contracts Dealing	523130	3
Commodity Contracts Brokerage	523140	2
Securities and Commodity Exchanges	523210	2
Miscellaneous Intermediation	523910	39
Portfolio Management	523920	39
Investment Advice	523930	11
All Other Financial Investment Activities	523990	7
Direct Individual Life, Health and Medical Insurance Carriers	524111	4
Direct Group Life, Health and Medical Insurance Carriers	524112	3
Direct General Property and Casualty Insurance Carriers	524121	9
Direct, Private, Automobile Insurance Carriers	524122	1
Direct, Public, Automobile Insurance Carriers	524123	0
Direct Property Insurance Carriers	524124	0
Direct Liability Insurance Carriers	524125	0
Other Direct Insurance (except Life, Health and Medical) Carriers	524129	1
Life Reinsurance Carriers	524131	0
Accident and Sickness Reinsurance Carriers	524132	0
Automobile Reinsurance Carriers	524133	0
Property Reinsurance Carriers	524134	0
Liability Reinsurance Carriers	524135	0
General and Other Reinsurance Carriers	524139	0
Insurance Agencies and Brokerages	524210	11
Claims Adjusters	524291	2
All Other Insurance Related Activities	524299	7
Trusteed Pension Funds	526111	0
Non-Trusteed Pension Funds	526112	0
Equity Funds - Canadian	526911	0
Equity Funds - Foreign	526912	0
Mortgage Funds	526913	0
Money Market Funds	526914	0
Bond and Income / Dividend Funds - Canadian	526915	0
Bond and Income / Dividend Funds - Foreign	526916	0
Balanced Funds / Asset Allocation Funds	526917	0
Other Open-Ended Funds	526919	0
Segregated (except Pension) Funds	526930	0

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Securitization Vehicles	526981	0
All Other Miscellaneous Funds and Financial Vehicles	526989	1
Lessors of Residential Buildings and Dwellings (except Social Housing Projects)	531111	1
Lessors of Social Housing Projects	531112	0
Lessors of Non-Residential Buildings (except Mini-Warehouses)	531120	17
Self-Storage Mini-Warehouses	531130	0
Lessors of Other Real Estate Property	531190	2
Real Estate Agents	531211	1
Offices of Real Estate Brokers	531212	9
Real Estate Property Managers	531310	7
Offices of Real Estate Appraisers	531320	3
Other Activities Related to Real Estate	531390	2
Passenger Car Rental	532111	1
Passenger Car Leasing	532112	1
Truck, Utility Trailer and RV (Recreational Vehicle) Rental and Leasing	532120	3
Consumer Electronics and Appliance Rental	532210	0
Formal Wear and Costume Rental	532220	0
Video Tape and Disc Rental	532230	2
Other Consumer Goods Rental	532290	8
General Rental Centres	532310	1
Construction, Transportation, Mining, and Forestry Machinery and Equipment Rental and Leasing	532410	30
Office Machinery and Equipment Rental and Leasing	532420	3
Other Commercial and Industrial Machinery and Equipment Rental and Leasing	532490	22
Lessors of Non-Financial Intangible Assets (Except Copyrighted Works)	533110	25
Architectural, Engineering and Related Services		935
Architectural Services	541310	19
Landscape Architectural Services	541320	4
Engineering Services	541330	709
Drafting Services	541340	19
Building Inspection Services	541350	5
Geophysical Surveying and Mapping Services	541360	29
Surveying and Mapping (except Geophysical) Services	541370	38
Testing Laboratories	541380	112
Computer System Design and Related		2,670
Computer Systems Design and Related Services	541510	2,670
Management, Scientific and Technical Consulting		440
Administrative Management and General Management Consulting Services	541611	147
Human Resources Consulting Services	541612	10
Other Management Consulting Services	541619	83
Environmental Consulting Services	541620	71
Other Scientific and Technical Consulting Services	541690	129
Scientific Research and Development		956
Scientific Research and Development Services	5417	956
Health Care and Social Assistance		217
Offices of Physicians	621110	62
Offices of Dentists	621210	19
Offices of Chiropractors	621310	3
Offices of Optometrists	621320	5
Offices of Mental Health Practitioners (except Physicians)	621330	9
Offices of Physical, Occupational, and Speech Therapists and Audiologists	621340	6
Offices of All Other Health Practitioners	621390	9
Family Planning Centres	621410	3
Out-Patient Mental Health and Substance Abuse Centres	621420	1
Community Health Centres	621494	2
All Other Out-Patient Care Centres	621499	3
Medical and Diagnostic Laboratories	621510	74
Home Health Care Services	621610	2
Ambulance (except Air Ambulance) Services	621911	1
Air Ambulance Services	621912	0
All Other Ambulatory Health Care Services	621990	3

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
General (except Paediatric) Hospitals	622111	1
Paediatric Hospitals	622112	0
Psychiatric and Substance Abuse Hospitals	622210	0
Specialty (except Psychiatric and Substance Abuse) Hospitals	622310	3
Nursing Care Facilities	623110	0
Residential Developmental Handicap Facilities	623210	0
Residential Substance Abuse Facilities	623221	0
Homes for the Psychiatrically Disabled	623222	0
Community Care Facilities for the Elderly	623310	0
Transition Homes for Women	623991	0
Homes for Emotionally Disturbed Children	623992	0
Homes for the Physically Handicapped or Disabled	623993	0
All Other Residential Care Facilities	623999	1
Child and Youth Services	624110	0
Services for the Elderly and Persons with Disabilities	624120	2
Other Individual and Family Services	624190	1
Community Food Services	624210	0
Community Housing Services	624220	1
Emergency and Other Relief Services	624230	4
Vocational Rehabilitation Services	624310	1
Child Day-Care Services	624410	1
All Other Services		1,712
Offices of Lawyers	541110	3
Offices of Notaries	541120	0
Other Legal Services	541190	10
Offices of Accountants	541212	8
Tax Preparation Services	541213	1
Bookkeeping, Payroll and Related Services	541215	20
Interior Design Services	541410	5
Industrial Design Services	541420	80
Graphic Design Services	541430	38
Other Specialized Design Services	541490	16
Advertising Agencies	541810	58
Public Relations Services	541820	3
Media Buying Agencies	541830	1
Media Representatives	541840	5
Display Advertising	541850	19
Direct Mail Advertising	541860	5
Advertising Material Distribution Services	541870	3
Specialty Advertising Distributors	541891	9
All Other Services Related to Advertising	541899	13
Marketing Research and Public Opinion Polling	541910	27
Photographic Services	541920	13
Translation and Interpretation Services	541930	4
Veterinary Services	541940	7
All Other Professional, Scientific and Technical Services	541990	78
Holding Companies	551113	198
Head Offices	551114	39
Office Administrative Services	561110	104
Facilities Support Services	561210	1
Employment Placement Agencies and Executive Search Services	561310	9
Temporary Help Services	561320	8
Employee Leasing Services	561330	1
Document Preparation Services	561410	10
Telephone Call Centres	561420	12
Business Service Centres	561430	14
Collection Agencies	561440	5
Credit Bureaus	561450	7
Other Business Support Services	561490	10
Travel Agencies	561510	8
Tour Operators	561520	4
Other Travel Arrangement and Reservation Services	561590	3
Investigation Services	561611	6
Security Guard and Patrol Services	561612	5
Armoured Car Services	561613	0
Security Systems Services (except Locksmiths)	561621	33
Locksmiths	561622	1
Exterminating and Pest Control Services	561710	4

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Window Cleaning Services	561721	0
Janitorial Services (except Window Cleaning)	561722	9
Landscaping Services	561730	23
Carpet and Upholstery Cleaning Services	561740	4
Duct and Chimney Cleaning Services	561791	2
All Other Services to Buildings and Dwellings	561799	5
Packaging and Labelling Services	561910	25
Convention and Trade Show Organizers	561920	6
All Other Support Services	561990	75
Elementary and Secondary Schools	611110	0
Community Colleges and C.E.G.E.P.s	611210	3
Universities	611310	0
Business and Secretarial Schools	611410	2
Computer Training	611420	13
Professional and Management Development Training	611430	11
Technical and Trade Schools	611510	7
Fine Arts Schools	611610	1
Athletic Instruction	611620	4
Language Schools	611630	1
All Other Schools and Instruction	611690	13
Educational Support Services	611710	11
Theatre (except Musical) Companies	711111	1
Musical Theatre and Opera Companies	711112	0
Dance Companies	711120	0
Musical Groups and Artists	711130	0
Other Performing Arts Companies	711190	1
Sports Teams and Clubs	711211	1
Horse Race Tracks	711213	1
Other Spectator Sports	711218	3
Live Theatres and Other Performing Arts Presenters with Facilities	711311	0
Sports Stadiums and Other Presenters with Facilities	711319	2
Performing Arts Promoters (Presenters) without Facilities	711321	2
Festivals without Facilities	711322	0
Sports Presenters and Other Presenters without Facilities	711329	1
Agents and Managers for Artists, Athletes, Entertainers and Other Public Figures	711410	0
Independent Artists, Visual Arts	711511	6
Independent Actors, Comedians and Performers	711512	3
Independent Writers and Authors	711513	5
Non-Commercial Art Museums and Galleries	712111	0
History and Science Museums	712115	1
Other Museums	712119	0
Historic and Heritage Sites	712120	0
Zoos and Botanical Gardens	712130	2
Nature Parks and Other Similar Institutions	712190	1
Amusement and Theme Parks	713110	1
Amusement Arcades	713120	1
Casinos (except Casino Hotels)	713210	0
Lotteries	713291	2
All Other Gambling Industries	713299	3
Golf Courses and Country Clubs	713910	0
Skiing Facilities	713920	4
Marinas	713930	1
Fitness and Recreational Sports Centres	713940	4
Bowling Centres	713950	0
All Other Amusement and Recreation Industries	713990	4
Hotels	721111	0
Motor Hotels	721112	0
Resorts	721113	1
Motels	721114	0
Casino Hotels	721120	0
Bed and Breakfast	721191	0
Housekeeping Cottages and Cabins	721192	1
All Other Traveller Accommodation	721198	0
RV (Recreational Vehicle) Parks and Campgrounds	721211	0
Hunting and Fishing Camps	721212	0
Recreational (except Hunting and Fishing) and Vacation Camps	721213	0
Rooming and Boarding Houses	721310	1
Full-Service Restaurants	722110	22

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Limited-Service Eating Places	722210	20
Food Service Contractors	722310	1
Caterers	722320	11
Mobile Food Services	722330	1
Drinking Places (Alcoholic Beverages)	722410	8
General Automotive Repair	811111	42
Automotive Exhaust System Repair	811112	2
Other Automotive Mechanical and Electrical Repair and Maintenance	811119	17
Automotive Body, Paint and Interior Repair and Maintenance	811121	31
Automotive Glass Replacement Shops	811122	1
Car Washes	811192	3
All Other Automotive Repair and Maintenance	811199	1
Electronic and Precision Equipment Repair and Maintenance	811210	52
Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	811310	210
Home and Garden Equipment Repair and Maintenance	811411	10
Appliance Repair and Maintenance	811412	6
Reupholstery and Furniture Repair	811420	10
Footwear and Leather Goods Repair	811430	0
Other Personal and Household Goods Repair and Maintenance	811490	22
Barber Shops	812114	1
Beauty Salons	812115	3
Unisex Hair Salons	812116	1
Other Personal Care Services	812190	14
Funeral Homes	812210	0
Cemeteries and Crematoria	812220	1
Coin-Operated Laundries and Dry Cleaners	812310	0
Dry Cleaning and Laundry Services (except Coin-Operated)	812320	5
Linen and Uniform Supply	812330	1
Pet Care (except Veterinary) Services	812910	1
Photo Finishing Laboratories (except One-Hour)	812921	6
One-Hour Photo Finishing	812922	0
Parking Lots and Garages	812930	2
All Other Personal Services	812990	7
Religious Organizations	813110	0
Grant-Making and Giving Services	813210	1
Social Advocacy Organizations	813310	4
Civic and Social Organizations	813410	4
Business Associations	813910	9
Professional Organizations	813920	2
Labour Organizations	813930	1
Political Organizations	813940	0
Other Membership Organizations	813990	0
Private Households	814110	1
Defence Services	911110	0
Federal Courts of Law	911210	0
Federal Correctional Services	911220	0
Federal Police Services	911230	0
Federal Regulatory Services	911240	0
Other Federal Protective Services	911290	0
Federal Labour and Employment Services	911310	0
Immigration Services	911320	0
Other Federal Labour, Employment and Immigration Services	911390	0
Foreign Affairs	911410	0
International Assistance	911420	1
Other Federal Government Public Administration	911910	0
Provincial Courts of Law	912110	0
Provincial Correctional Services	912120	0
Provincial Police Services	912130	0
Provincial Fire-Fighting Services	912140	0
Provincial Regulatory Services	912150	0
Other Provincial Protective Services	912190	0
Provincial Labour and Employment Services	912210	0
Other Provincial and Territorial Public Administration	912910	0
Municipal Courts of Law	913110	0
Municipal Correctional Services	913120	0
Municipal Police Services	913130	0
Municipal Fire-Fighting Services	913140	0
Municipal Regulatory Services	913150	0

Table 17-4 – continued

Research and development performers by the North American industry classification system (NAICS) 2007, in 2007

	NAICS Code	Performers number
Other Municipal Protective Services	913190	1
Other Local, Municipal and Regional Public Administration	913910	0
Aboriginal Public Administration	914110	0
International and Other Extra-Territorial Public Administration	919110	0

Note(s): Empty cells under the NAICS column appear where there is a subtotal of the number of industry performers.

Table 18
Enterprises with one or more employee, by industry, with percentage change from 2002 to 2007 and percentage distribution, 2007

	2002	2003	2004	2005	2006 ^r	2007	Change from 2002 to 2007	2007 distribution
	number						percent	
Total	966,766	962,987	952,985	959,856	973,485	974,910	0.8	100.0
Agriculture, forestry, fishing and hunting	60,777	58,896	57,048	56,254	54,926	49,119	-19.2	5.0
Agriculture	43,498	42,150	40,870	40,393	39,544	35,201	-19.1	3.6
Forestry and logging	10,906	10,399	9,971	9,722	9,414	8,410	-22.9	0.9
Fishing, hunting and trapping	6,373	6,347	6,207	6,139	5,968	5,508	-13.6	0.6
Mining and oil and gas extraction	7,045	7,059	7,315	7,639	8,332	8,326	18.2	0.9
Oil and gas extraction	5,487	5,639	5,911	6,190	6,780	6,684	21.8	0.7
Mining	1,558	1,420	1,404	1,449	1,552	1,642	5.4	0.2
Utilities	3,227	3,215	3,162	3,248	3,423	3,485	8.0	0.4
Electric power	436	430	433	435	457	469	7.6	0.0
Other utilities	2,791	2,785	2,729	2,813	2,966	3,016	8.1	0.3
Construction	108,627	110,070	110,213	113,733	118,278	116,165	6.9	11.9
Manufacturing	57,708	56,331	54,669	53,885	53,580	52,553	-8.9	5.4
Food	6,021	5,815	5,575	5,404	5,254	5,226	-13.2	0.5
Beverage and tobacco	577	573	580	578	630	618	7.1	0.1
Textile	1,774	1,712	1,625	1,563	1,477	1,410	-20.5	0.1
Wood products	4,168	3,907	3,702	3,745	3,729	3,675	-11.8	0.4
Paper	679	670	635	617	590	588	-13.4	0.1
Printing	5,012	4,851	4,697	4,655	4,535	4,357	-13.1	0.4
Petroleum and coal products	191	161	128	131	147	153	-19.9	0.0
Pharmaceutical and medicine	266	262	262	268	267	265	-0.4	0.0
Other chemicals	1,555	1,573	1,520	1,511	1,507	1,487	-4.4	0.2
Plastic products	1,908	1,888	1,857	1,846	1,775	1,739	-8.9	0.2
Rubber products	327	319	303	288	281	275	-15.9	0.0
Non-metallic mineral products	1,987	1,946	1,916	1,854	1,857	1,870	-5.9	0.2
Primary metal (ferrous)	333	290	284	303	314	325	-2.4	0.0
Primary metal (non-ferrous)	317	298	294	294	281	278	-12.3	0.0
Fabricated metal products	8,361	8,224	8,000	7,947	7,974	7,907	-5.4	0.8
Machinery	5,274	5,172	5,071	5,091	5,109	5,041	-4.4	0.5
Computer and peripheral equipment	279	258	258	261	257	247	-11.5	0.0
Communications equipment	287	282	290	297	296	283	-1.4	0.0
Semiconductor and other electronic components	490	483	473	443	439	422	-13.9	0.0
Navigational, measuring, medical and control instruments	854	825	808	766	769	750	-12.2	0.1
Other computer and electronic products	210	211	191	183	191	187	-11.0	0.0
Electrical equipment, appliance and components	1,150	1,100	1,078	1,085	1,085	1,073	-6.7	0.1
Motor vehicle and parts	1,345	1,325	1,301	1,298	1,308	1,295	-3.7	0.1
Aerospace products and parts	285	224	212	218	221	233	-18.2	0.0
All other transportation equipment	694	656	636	617	602	558	-19.6	0.1
Furniture and related products	4,380	4,382	4,349	4,269	4,350	4,268	-2.6	0.4
Other manufacturing industries	8,984	8,924	8,624	8,353	8,335	8,023	-10.7	0.8
Services	729,382	727,416	720,578	725,097	734,946	745,262	2.2	76.4
Wholesale trade	54,451	53,663	51,951	51,789	52,281	51,184	-6.0	5.3
Retail trade	109,648	108,105	107,511	106,531	105,893	104,288	-4.9	10.7
Transportation and warehousing	42,689	42,601	42,481	43,157	44,528	43,666	2.3	4.5
Information and cultural industries	11,600	11,451	11,224	11,263	11,450	10,934	-5.7	1.1
Finance, insurance and real estate	65,746	64,889	64,095	69,398	70,740	62,436	-5.0	6.4
Architectural, engineering and related services	17,435	17,271	17,228	17,675	18,576	17,643	1.2	1.8
Computer system design and related services	20,754	20,822	20,709	21,610	23,174	21,865	5.4	2.2
Management, scientific and technical consulting services	26,471	27,036	27,019	27,483	27,045	24,258	-8.4	2.5
Scientific research and development services	2,241	2,276	2,267	2,298	2,422	2,403	7.2	0.2
Health care and social assistance	77,074	78,127	77,765	77,959	79,256	81,031	5.1	8.3
All other services	301,273	301,175	298,328	295,934	299,581	325,554	8.1	33.4

Note(s): Components may not add to totals due to rounding.

Source(s): Statistics Canada, Business Register, enterprises with one or more employees, December 2000-2005.

Survey methodology

The 2008 survey

The 2008 survey collected data on four years. The four years were:

- 2007 for which the data are expected to be final;
- 2008 for which the data are expected to be close to final,
- 2009 for which the data are planned expenditures, and
- 2010 for which the data are a forecast of spending intentions.

Estimates are not available for administrative data for 2009 and 2010. Therefore, based on the percentage increase or decrease by industry reported by the surveyed firms, forecasts are made for planned expenditures and spending intentions based on the administrative data.

The 2008 survey was mailed out in July 2009. The largest performers by industry group were selected, along with a random sample of small and medium R&D performers. Particulars of these changes are elaborated below.

The mailing list of companies was made up of firms which had reported R&D in the previous surveys, firms claiming an R&D income tax incentive for 2008, firms reported by government respondents as R&D contractors or grantees for 2008 to 2009, firms reported by other companies as funding or performing of R&D, and firms indicated in some other way, such as newspaper or journal articles or provincial directories. These larger performing and/or funding companies received the Research and Development in Canadian Industry questionnaire, covering R&D performing expenditures for: 2007, 2008, 2009 and 2010.

Upcoming and recent changes to survey methodology

The RDCI is continuing through an ongoing process of change. There have been a series of changes in methodology over the past few reference years and will experience changes going forward. These changes are itemized below by reference year in which they are being or were implemented.

Changes implemented for the 2009 reference year

Data users are advised that the RDCI will be formally linked to the Business Register (BR) for reference year 2009. The BR is the survey frame for all industry-based surveys. As part of the linking process some statistical entities which were treated as enterprises for the RDCI universe are in fact companies on the BR (<http://www.statcan.gc.ca/concepts/units-unites-eng.htm>). Steps are being taken to ensure consistency of the data at the industry level, but there may be some impact in the distribution R&D expenditures and personnel at the industry level.

Changes implemented for the 2008 reference year

For reference year 2008 the survey sample methodology was revised to improve the quality of forecast estimates at the industry level. The entire population of all known R&D performing enterprises and firms which fund or purchase technologies were sorted by NAICS-based industrial categories (link to BSMD report) and then divided into the following groups:

1. Special entities were included on a "must-take" list. These entities included industrial non-profit organizations, known R&D performers that do not file scientific research and experimental development SR&ED tax credit applications, and technology purchasers or vendors.
2. The largest R&D performers in each industrial category (the "take-all" list). These large firms cover about two-thirds of R&D expenditures in the given industry group.
3. Mid-size R&D performers in each industrial category were placed on the "take-some" list, which meant that these units were randomly selected within each industrial category.
4. The smallest R&D performers in each industrial category were placed on a "take-none" list and excluded from the sample so as to reduce response burden for the smallest firms. These firms continue to be included in our tabulations as their R&D data is imputed using CRA administrative data from the SR&ED program.

Changes implemented for the 2007 reference year

For reference year 2007, all companies believed to be performing or funding one and a half million dollars or more of R&D were sent a questionnaire. The mailing list of companies was made up of firms which had reported R&D in the previous survey, of firms claiming an R&D income tax incentive for 2007, of firms reported by government respondents as R&D contractors or grantees for 2007 to 2008, of firms reported by other companies as funding or performing of R&D, and of firms indicated in some other way, such as newspaper or journal articles or provincial directories. These larger performing and/or funding companies received the Research and Development in Canadian Industry questionnaire, covering R&D performing expenditures for: 2006, 2007, 2008 and 2009.

Changes implemented for the 2006 reference year

To relieve respondent burden, the survey threshold was raised from one million dollars to one and one half million dollars in the survey year 2006, thereby reducing the number of surveyed firms. These firms continue to be included in our tabulations as their R&D data is imputed using CRA administrative data from the SR&ED program.

To improve data quality for two of the survey's classification variables - Revenues in Canada and Number of Employees in Canada - administrative sources were used to replace missing or inconsistent data.

Beginning reference year 2005, revenue figures for the SR&ED tax filers were adjusted to reflect corporate income tax data for the corresponding filer. These tax data are from T2 corporate income tax data mapped to the Statistics Canada Chart of Accounts (COA) classification, by firm, from Tax Data Division. The variable COA4 comprises (Total) Revenue for firms. COA4 values were used to improve data quality for missing total revenues data from reference year 1997 through the current year. Inconsistent reported total revenue data were also examined by subject matter experts with reference to COA4 data. Within the publication, the revisions have impacted the revenue size groups. It is believed the revisions have substantially improved the quality of the revenue variable.

Beginning reference year 2006, Canada Revenue Agency (CRA) Payroll Deductions total employment data (PD7) was used to improve the quality of missing or inconsistent total employment data for survey years 2001 through the current survey year. Payroll Deduction data are monthly data, therefore an annual average is calculated from CRA monthly Payroll Deduction data for all business enterprises that reported having one or more employees in at least one of the twelve months of the tax year.

2008 Canada Revenue Agency (CRA) changes to the Scientific Research and Experimental Development (SR&ED) tax forms

In 2008, the Canada Revenue Agency (CRA) introduced new tax forms for applicants to the Scientific Research and Experimental Development (SR&ED) investment tax credit program. These changes have impacted the data produced from the Research and Development in Canadian Industry (RDCI) survey. The new forms went into effect in November 2008. SR&ED applicants have been given the opportunity to use either the new or the old forms for

their financial years ending in 2008. Please see the CRA's web-site for copies of the new and old SR&ED tax forms (<http://www.cra-arc.gc.ca/E/pbg/tf/t661/README.html>).

The CRA changes that impact data continuity include:

- February 25, 2008, the federal budget provided for a change in the SR&ED tax qualified expenditures for wages and salaries of R&D activities performed outside of Canada that was directly performed by employee(s) of the applicant; "the employee who performed the SR&ED work was a resident of Canada at the time the expense was incurred; the SR&ED work carried on by the employees outside Canada was an integral part and solely in support of the SR&ED work for a project carried on in Canada; and salary or wages paid were not subject to income or profits tax from another country." (Guide to Form T661 – Scientific Research and Experimental Development (SR&ED) Expenditures Claim, <http://www.cra-arc.gc.ca/E/pub/tg/t4088/t4088-11e.html>, accessed December 09, 2008).
- The nature of R&D activities that are found in table 5 of the *Science Statistics* bulletin (88-001) on *Industrial Research and Development*, are no longer available.
- The area of specialization of R&D activities (biotechnology, software development, and environmental protection, found in *Industrial Research and Development Intentions, 2009* (88-202) in tables 15-1 15-2 and 15-3) are no longer available.
- R&D personnel are not clearly identified as required in full-time equivalent on the SR&ED form which may impact related tables.

Other changes to the SR&ED forms which impact data processing for 2008 reference year are:

- R&D expenditures are by project rather than program.
- Selected type of R&D activity by project is included.
- Science type has been added.
- Type of location used for R&D has been added.

For the 2008 R&D expenditures, SR&ED tax data was processed from two forms, therefore, data availability for 2008 is limited when compared with data from previous years.

The survey's history

Data on R&D in the business enterprise sector, covering commercially oriented enterprises (privately or publicly owned), industrial non-profit organizations and trade associations, have been collected since 1955. Until 1969, the survey was biennial. From 1970 to 1981, all known performing or funding companies of industrial R&D were surveyed for odd-numbered years and a sample, including the leading performers, were surveyed for even-numbered years. From 1982 to 1991, a full survey was conducted annually.

Because of reductions in the science and technology program, only the top 100 R&D performers (accounting for 64% of all industrial R&D) were surveyed for the 1992 and 1994 reference years. However, as a result of a cost-sharing agreement with the province of Quebec, the 1992 and 1994 industrial R&D survey results also included small firms having R&D activities in the province of Quebec.

Prior to 1997, Statistics Canada surveyed all firms that performed or funded R&D in Canada. Virtually all of these firms also provided information to CRA in order to claim tax benefits under the Scientific Research and Experimental Development (SR&ED) tax incentive program. In an effort to reduce respondent burden, Statistics Canada stopped surveying the small performing and funding companies (those with less than \$1 million of R&D in Canada) and instead, imputes their R&D data using CRA administrative data from the SR&ED tax incentive program. In the 2006 survey year this threshold was raised to \$1.5 million thereby further reducing respondent burden.

When first implemented, this administrative data initiative resulted in an understatement of the total value of intramural expenditure and of the total number of R&D personnel. Under the current tax regulations, firms must file their application to the SR&ED program within 18 months of expenditure. Once claims are submitted, they are processed and forwarded to Statistics Canada. As a result, data may not arrive for up to two years after the incurrence of expenditures. To remedy the situation, an imputation system was subsequently put into place to impute values for outstanding administrative data. This imputation system confirms the company is active using Statistics Canada's extensive Business Register, and then applies an imputation based on industry trends.

Recent developments in R&D spending are important economic signals, desired promptly by a variety of users. Because the small imputation of outstanding CRA data does not seriously influence overall trends, the R&D data are published as soon as possible after the survey is conducted, and revised in subsequent publications.

Data quality

One of the problems in a survey of this type is to ensure that the quality of the data is satisfactory. It cannot be expected that all firms funding R&D will be surveyed, will respond and will report correctly. There are sources of information such as federal government grant and contract lists to aid in identifying firms and editing returns. In addition, complete coverage cannot be assured. This is especially true for the smaller companies in the service industries. The term, R&D, in spite of survey guidelines, can be misinterpreted.

Different interpretations of the definition of R&D also result in discrepancies between federal government reporting of funds to industry (the business enterprise sector) for R&D and industry's reporting of such funds. For example, a federal government department may regard a contract to industry for the building of a prototype (e.g., communications satellite) as R&D. The contractors and subcontractors, however, may only use a portion of the R&D contract and even that portion may not be reported because the contract is considered as part of the firm's "routine" contract work. Differences may also arise for contracts awarded to industry for services or equipment required for a government in-house project which are reported by the federal sponsor as industrial R&D contracts. Therefore, the totals for R&D grants and contracts from the federal government to industry shown in this publication do not agree with those reported in *Federal Science Activities, 2009/2010*, (Catalogue no. 88-204-X-).

Other notes

The business enterprise sector is the only sector in which data are not collected on R&D in the social sciences and humanities.

In this survey, the sampling unit is the enterprise while the reporting unit may, in some cases, be the company. The survey is designed to reflect the structure of the enterprise as it appears on the Business Register and the structure of the enterprise as it reports its R&D activities (including reporting R&D expenditures for the SR&ED tax incentive program). This procedure creates a problem when classifying data by industry. An enterprise can only be assigned to one industry although that enterprise may have companies or establishments in several industries. The assignment is based on the activity from which the firm derived the greatest portion of its income. Thus, comparisons between R&D data collected at the enterprise or company level and other data collected at the establishment level, such as "census value added", may be misleading. Since industrial R&D is highly concentrated, the use of the company/enterprise as the main reporting unit also means that classification cannot be very detailed, to avoid disclosing individual company data.

The survey response

The response for the 2008 "base year" survey is shown below.

For 2008, the response rate was 65%. Survey questionnaires were mailed to 1,991 firms: 1,065 were returned; 256 indicated no research and development activity; 66 were out of business and 15 were included with another respondent.

An additional 19,771 firms were added to the survey universe from the 2008 Scientific Research & Experimental Development tax incentive program data.

Interpretation of R&D

Generally speaking, industrial R&D is intended to result in an invention which may subsequently become a technological innovation. An essential requirement is that the outcome of the work is uncertain, i.e., that the possibility of obtaining a given technical objective cannot be known in advance on the basis of current knowledge or experience. Hence much of the work done by scientists and engineers is not R&D, since they are primarily engaged in "routine" production, engineering, quality control or testing. Although they apply scientific or engineering principles their work is not directed towards the discovery of new knowledge or the development of new products and processes. However, work elements which are not considered R&D by themselves but which directly support R&D projects, should be included with R&D in these cases. Examples of such work elements are design and engineering, shop work, computer programming, and secretarial work.

If the primary objective is to make further technical improvements to the product or process, then the work comes within the definition of R&D. If however, the product, process or approach is substantially set and the primary objective is to develop markets, to do pre-production planning or to get a production or control system working smoothly, then the activity can no longer be considered as part of R&D even though it could be regarded as an important part of the total innovation process. Thus, the design, construction and testing of prototypes, models and pilot plants are part of R&D. But, when necessary modifications have been made and testing has been satisfactorily completed, the boundary of R&D has been reached. Hence, the costs of tooling (design and try-out), construction drawings and manufacturing blueprints, and production start-up are not included in development costs.

Pilot plants may be included in development only if the main purpose is to acquire experience and compile data. As soon as they begin operating as normal production units, their costs can no longer be attributed to R&D. Similarly, once the original prototype has been found satisfactory, the cost of other "prototypes" built to meet a special need or fill a very small order are not to be considered as part of R&D.

Text table 1
Specific cases and their treatment

Activity	Treatment	Remarks
Prototypes, pilot plants	Include	As long as the primary objective is to make further improvements.
Contracts for R&D	Include	All contracts which require R&D. For contracts which include other work, report only the R&D costs.
Economic research, market research, management studies	Exclude	All activities in the social sciences.
Quality control, routine testing, style changes, minor adaptation of a product to meet a customer's specific requirements	Exclude	Even if carried out by staff normally engaged in R&D
Prospecting, exploratory drilling, development of mines, oil or gas wells	Exclude	Except for R&D projects concerned with new equipment or techniques in these activities, such as in-situ and tertiary recovery research.
Engineering	Exclude	Engineering unless it is in direct support of R&D.
Design and drawing	Exclude	Design and drawing unless it is in direct support of R&D.
Tooling up, trial production, trouble shooting	Exclude	Although R&D may be required as a result of these steps.
Patent and licence work	Exclude	All administrative and legal work connected with patents and licences.

Reliability of the data

There are two main origins of error: sampling errors and non-sampling errors. Within these two varieties there are a series of different types of errors. These types of errors are specified below.

Non-sampling errors

The four main types of non-sampling error are:

- Coverage error
- Measurement error
- Non-response error
- Processing error

Coverage

"Coverage errors are introduced whenever the sampling frame...does not adequately represent the target population at the time of the survey."¹ They "consist of omissions, erroneous inclusions, duplications and misclassifications of units in the survey frame."²

Survey questionnaires are sent to all known and suspected, large R&D performing and/or funding companies i.e., those believed to have the largest R&D expenditures within their industry group.

Administrative data are used for the remaining R&D performing or funding companies which are not included in the questionnaire coverage. Companies have up to 18 months after their fiscal year end to claim a tax credit for their R&D expenditures. Underreporting due to this time lag is estimated to be less than 8%, and is largely corrected by imputation based on industry trends for all known performers who have not yet submitted their claim.

Measurement

"Measurement error is the difference between the recorded response to a question and the 'true' value... One of the main causes of measurement error is misunderstanding on the part of the respondent or interviewer."³

As a result of a reconciliation of federal and industrial accounts of government grants and contracts, we think that industrial R&D performance estimates may be slightly low. This is caused by the non-reporting of industrial R&D funded by contract. Such work is sometimes not distinguishable from non-R&D contract work.

The accuracy of the company's estimates of future expenditures has also been a problem in the past, particularly in the wells and petroleum products industries.

Non-response

"Non-response occurs when information required for a survey unit is missing. This could happen because the unit cannot be contacted, because the unit is unable to provide the information requested, or because the unit refuses to cooperate in the survey."⁴

Non-response is a potential problem in three areas. One is the estimate of R&D expenditures two years past the base year. If no response is provided, editing rules are applied and a response is imputed based on the response of a similar firm in the same industry group.

The second involves the administrative data used for the smaller R&D performers. These represent 20% of all R&D performed by businesses. Certain information is not asked of them. However, the missing data are imputed from the replies of the sampled performers in the same industry.

1. "A compendium of methods of error evaluation in censuses and surveys", Statistics Canada, 1978, Catalogue No. 13-564E.

2. "Survey methods and practices", Statistics Canada, 2003, Catalogue No. 12-587-XPE.

3. Ibid.

4. "A compendium of methods of error evaluation in censuses and surveys", Statistics Canada, 1978, Catalogue No. 13-564E.

Failure of surveyed companies to reply is the third type of non-response. We believe non-response error to be minor and may result in a minor under-estimation of R&D expenditures.

Processing

"Processing errors can occur during data coding, data capture, editing or imputation... Coding entails either assigning a code or comparing a response to a set of codes and selecting the one that best describes the response ... Data capture errors result when the data are not entered into the computer exactly as they appear on the questionnaire... Editing is the application of checks to identify missing, invalid or inconsistent entries that point to data records that are potentially in error. Imputation is a process used to determine and assign replacement values to resolve problems of missing, invalid or inconsistent data."⁵

Processing errors are often monitored and controlled using quality control techniques.

Data capture

"The data capture operation in a census or survey consists of converting the data received on questionnaires (e.g., respondent answers) to a machine readable format."⁶

All data received from respondents are captured into a database application for further processing.

Significant uncorrected data capture errors are unlikely because of the examination of numerous tables and listings prepared for data validation and analysis before publication tables are created.

Edit and imputation

"The edit procedure usually consists of: (i) checking each field of every record to ascertain whether it contains a valid code or entry; (ii) checking codes or entries in certain predetermined combinations of fields to ascertain whether codes or entries are consistent with one another... The imputation procedure consists of changing values in some of the fields in records which failed the edit rules with a view to ensuring that the resultant data records satisfy all edit rules."⁷

Although there are a number of edits, all cases of failed edit checks are corrected after review. Automatic imputations are made for the administrative SR&ED tax data portion of the universe as well as for non-response and invalid response within the questionnaire portion of the universe.

Sampling

"Sampling error (is) defined as the error that results from estimating a population characteristic by measuring a portion of the population rather than the entire population."⁸

Although a complete enumeration is carried out of known and suspected R&D performing and/or funding companies, records received from the administrative data do not provide as much information as does the sampled universe. Certain data are imputed for records from the administrative file based on the patterns of survey response in the same industry.

5. "Survey methods and practices", Statistics Canada, 2003, Catalogue No. 12-587-XPE.

6. Ibid.

7. Ibid.

8. Ibid.

Technical notes

Data availability

Data for the reference year 2008 are available for all tables with the exception of counts of companies.

In the even years prior to 1982 and for 1992 and 1994, the estimation procedures did not permit the preparation of tables based on revenue size, employment size, sources of funds and country of control of companies.

Regional data on research and development (R&D) expenditures and personnel are only available for 1977, 1979 and 1981 to 2008.

Terminology

The following terminology is used within the publication:

Performing company: is the organization which carried out the R&D. In the case of a consolidated return, performing company could include several companies. It also includes divisions of an enterprise which send separate returns or organizations such as industrial non-profit organizations.

Related companies: Includes parent, subsidiary and other affiliated companies. In the case where a consolidated return is submitted, "related companies" would exclude companies included in the consolidation.

R&D contracts for other companies: R&D contract work performed by the reporting company for other companies.

Federal grants: Federal R&D grants and the R&D portion of any other federal grants; it excludes funds or tax credits for R&D tax incentives.

Federal contracts: Federal R&D contracts and the R&D portion of any other federal contracts.

Provincial sources: Provincial R&D grants and contracts, and the R&D portion of any provincial grants and contracts; it excludes funds or tax credits for R&D tax incentives.

Other Canadian sources: Includes funds from universities and from levels of government other than federal and provincial.

Intramural expenditures: Expenditures for R&D work performed within the reporting company, including work financed by others.

Current intramural expenditures: Labour costs, fringe benefits and other current costs for R&D, including non-capital purchases of materials, supplies and equipment but excluding capital depreciation. Current intramural expenditures also include contracts for services required to carry out R&D (e.g. contracts awarded for drilling needed for heavy oil R&D).

Capital expenditures: Expenditures on fixed assets used in the R&D program, classified into land, buildings, and equipment.

Revenues: Revenues resulting from the sale of products and services (after deducting sales and excise taxes), and other revenues such as those generated from investment and rentals.

Non-commercial firms: R&D performers without a directly affiliated Canadian commercial base. Included are industrial non-profit organizations and trade associations, R&D performed by consortia, and R&D performed by non-residents without associated commercial enterprises and funded principally from abroad.

Country of control: In most cases of foreign control, the country of control is the country of residence of the ultimate foreign controlling parent corporation, family, trust, estate or related group. Each subsidiary within the global enterprise is assigned the same country of control as its parent. A company whose voting rights are equally owned by Canadian-controlled and foreign-controlled corporations is Canadian-controlled. If two foreign-controlled corporations jointly own an equal amount of the voting rights of a Canadian resident company, the country of control is assigned according to an order of precedence based on their aggregate level of foreign control in Canada.

For example, United States takes precedence over all other foreign countries because it has the highest level of aggregate foreign control in Canada.

R&D personnel: Calculated in full-time equivalent (FTE). R&D may be carried out by persons who work solely on R&D projects or by persons who devote only part of their time to R&D, and the balance to other activities such as testing, quality control and production engineering. To arrive at the total effort devoted to R&D in terms of person-years, it is necessary to estimate the full-time equivalent of these persons working only part-time in R&D.

Full-time equivalent (FTE) = number of persons who work solely on R&D projects + estimate of time of persons working only part of their time on R&D.

Example calculation:

If out of five scientists engaged in R&D work, one works solely on R&D projects and the remaining four devote only one quarter of their working time to R&D, then: $FTE = 1 + 1/4 + 1/4 + 1/4 + 1/4 = 2$ scientists.

Federal government funds for industrial R&D: Federal support consists of grants and contracts for R&D to be performed by business enterprises. Taxes foregone as a result of income tax incentives for R&D are not considered direct government support and are not attributed to the federal government.

Industrial classification

North American Industry Classification System (NAICS) is the standard industrial classification system used for presenting R&D expenditures data for the business enterprise sector. There are limitations to its use. One important limitation is due to enterprises with activities in more than one industry (e.g., companies which both refine petroleum and extract oil). Another is caused by the concentration of the R&D activity among a few enterprises. In order to prevent disclosure of individual respondents NAICS codes may be combined to provide sufficient observations for publication.

A third problem is that the classification, chosen to represent general industrial activity, may not be entirely suitable for identifying companies chosen only for their involvement in R&D.

There are some restrictions on the application of the NAICS, for example, industrial non-profit organizations will be assigned to the industry they support.

The R&D activities of other sectors such as the federal government, provincial governments, higher education, and private non-profit organizations are covered in other reports.

Definitions

Research and development

For the purpose of this survey, research and development (R&D) is systematic investigation carried out in the natural and engineering sciences by means of experiment or analysis to achieve a scientific or technological advance.

Research is original investigation undertaken on a systematic basis to gain new knowledge.

Development is the application of research findings or other scientific knowledge for the creation of new or significantly improved products or processes. If successful, development will usually result in devices or processes which represent an improvement in the "state of the art" and are likely to be patentable.

Example:

The investigation of electrical conduction in crystals was research. The application of this knowledge to the creation of a new amplifying device - the transistor - was development. The application of the device to the construction of new electrical circuits for television receivers was development. The formulation of new plastic cases for a television receiver is design, not development.

Research and development may be carried out either by a permanent R&D unit (e.g., R&D division) or by a unit generally engaged in any non-R&D activity such as engineering or production. In the first case, the R&D unit may spend part of its time on routine testing or trouble shooting or on some other activities which should not be included in R&D. In the second, only the R&D portion of such units' total activity should be considered.

Research and development should be considered to be "Scientific Research and Experimental Development" as defined in Section 37, Regulation 2900 of the Income Tax Act; this section specifically excludes the following:

- i. market research, sales promotion,
- ii. quality control or routine analysis and testing of materials, devices or products,
- iii. research in the social sciences or the humanities,
- iv. prospecting, exploring or drilling for or producing minerals, petroleum or natural gas,
- v. the commercial production of a new or improved material, device or product or the commercial use of a new or improved process,
- vi. style changes, or routine data collection,

Note:

Although the definition of "Scientific Research and Experimental Development" is considered to be the same as R&D, certain expenditures for scientific research cannot be claimed for income tax purposes (e.g., land, building). All expenditures attributable to R&D are included in this report.

Appendix I

North American industry classification system 2007 by Industry group

Agriculture, forestry, fishing and hunting

Agriculture	111110, 111120, 111130, 111140, 111150, 111160, 111190, 111211, 111219, 111310, 111320, 111330, 111411, 111419, 111421, 111422, 111910, 111920, 111930, 111940, 111993, 111994, 111999, 112110, 112120, 112210, 112310, 112320, 112330, 112340, 112391, 112399, 112410, 112420, 112910, 112920, 112930, 112991, 112999, 115110, 115210, 115212
Forestry and logging	113110, 113210, 113311, 113312, 115310
Fishing, hunting and trapping	114113, 114114, 114210, 112510

Mining and oil and gas extraction

Oil and gas extraction	211113, 211114, 213111, 213118
Mining	212114-212116, 212210, 212220, 212231-212233, 212291, 212299, 212314-212317, 212323, 212326, 212392-212398, 213117, 213119

Utilities

Electric power	221111-221113, 221119, 221121, 221122
Other utilities	221210, 221310, 221320, 221330, 562110, 562210, 562910, 562920, 562990

Construction

236110, 236210, 236220, 237110, 237120, 237130, 237210, 237310, 237990, 238110, 238120, 238130, 238140, 238150, 238160, 238170, 238190, 238210, 238220, 238291, 238299, 238310, 238320, 238330, 238340, 238350, 238390, 238910, 238990

Manufacturing

Food	311111, 311119, 311211, 311214, 311221, 311224, 311225, 311230, 311310, 311320, 311330, 311340, 311410, 311420, 311511, 311515, 311520, 311611, 311614, 311615, 311710, 311811, 311814, 311821-311823, 311830, 311911, 311919, 311920, 311930, 311940, 311990
Beverage and tobacco	312110, 312120, 312130, 312140, 312210, 312220
Textile	313110, 313210, 313220, 313230, 313240, 313310, 313320, 314110, 314120, 314910, 314990
Wood products	321111, 321112, 321114, 321211, 321212, 321215-321217, 321911, 321919, 321920, 321991, 321992, 321999
Paper	322111, 322112, 322121, 322122, 322130, 322211, 322212, 322219, 322220, 322230, 322291, 322299
Printing	323113-323116, 323119, 323120
Petroleum and coal products	324110, 324121, 324122, 324190
Pharmaceutical and medicine	325410
Other chemical	325110, 325120, 325130, 325181, 325189, 325190, 325210, 325220, 325313, 325314, 325320, 325510, 325520, 325610, 325620, 325910, 325920, 325991, 325999
Plastic products	326111, 326114, 326121, 326122, 326130, 326140, 326150, 326160, 326191, 326193, 326196, 326198
Rubber products	326210, 326220, 326290

Non-metallic mineral products	327110, 327120, 327214, 327215, 327310, 327320, 327330, 327390, 327410, 327420, 327910, 327990
Primary metal (ferrous)	331110, 331210, 331221, 331222, 331511, 331514
Primary metal (non-ferrous)	331313, 331317, 331410, 331420, 331490, 331523, 331529
Fabricated metal products	332113, 332118, 332210, 332311, 332314, 332319, 332321, 332329, 332410, 332420, 332431, 332439, 332510, 332611, 332619, 332710, 332720, 332810, 332910, 332991, 332999
Machinery	333110, 333120, 333130, 333210, 333220, 333291, 333299, 333310, 333413, 333416, 333511, 333519, 333611, 333619, 333910, 333920, 333990
Computer and peripheral equipment	334110
Communications equipment	334210, 334220, 334290
Semiconductor and other electronic components	334410
Navigational, measuring, medical and control instruments	334511, 334512
Other computer and electronic products	334310, 334610
Electrical equipment, appliance and components	335110, 335120, 335210, 335223, 335229, 335311, 335312, 335315, 335910, 335920, 335930, 335990
Motor vehicle and parts	336110, 336120, 336211, 336212, 336215, 336310, 336320, 336330, 336340, 336350, 336360, 336370, 336390
Aerospace products and parts	336410
All other transportation equipment	336510, 336611, 336612, 336990
Furniture and related products	337110, 337121, 337123, 337126, 337127, 337213-337215, 337910, 337920
Other manufacturing industries	315110, 315190, 315210, 315221, 315222, 315226, 315227, 315229, 315231-315234, 315239, 315291, 315292, 315299, 315990, 316110, 316210, 316990, 339110, 339910, 339920, 339930, 339940, 339950, 339990
Services	
Wholesale trade	411110, 411120, 411130, 411190, 412110, 413110, 413120, 413130, 413140, 413150, 413160, 413190, 413210, 413220, 413310, 414110, 414120, 414130, 414210, 414220, 414310, 414320, 414330, 414390, 414410, 414420, 414430, 414440, 414450, 414460, 414470, 414510, 414520, 415110, 415120, 415190, 415210, 415290, 415310, 416110, 416120, 416210, 416310, 416320, 416330, 416340, 416390, 417110, 417210, 417220, 417230, 417310, 417320, 417910, 417920, 417930, 417990, 418110, 418120, 418190, 418210, 418220, 418310, 418320, 418390, 418410, 418910, 418920, 418930, 418990, 419110, 419120
Retail trade	441110, 441120, 441210, 441220, 441310, 441320, 442110, 442210, 442291, 442292, 442298, 443110, 443120, 443130, 444110, 444120, 444130, 444190, 444210, 444220, 445110, 445120, 445210, 445220, 445230, 445291, 445292, 445299, 445310, 446110, 446120, 446130, 446191, 446199, 447110, 447190, 448110, 448120, 448130, 448140, 448150, 448191, 448199, 448210, 448310, 448320, 451110, 451120, 451130, 451140, 451210, 451220, 452110, 452910, 452991, 452999, 453110, 453210, 453220, 453310, 453910, 453920, 453930, 453992, 453999, 454111, 454112, 454113, 454210, 454311, 454312, 454319, 454390

Transportation and warehousing	481110, 481214, 481215, 482112-482114, 483115, 483116, 483213, 483214, 484110, 484121, 484122, 484210, 484221-484223, 484229, 484231-484233, 484239, 485110, 485210, 485310, 485320, 485410, 485510, 485990, 486110, 486210, 486910, 486990, 487110, 487210, 487990, 488111, 488119, 488190, 488210, 488310, 488320, 488331, 488332, 488339, 488390, 488410, 488490, 488511, 488519, 488990, 491110, 492110, 492210, 493110, 493120, 493130, 493190
Information and cultural industries	511110, 511120, 511130, 511140, 511190, 511210, 512110, 512120, 512130, 512190, 512210, 512220, 512230, 512240, 512290, 515110, 515120, 515210, 517111, 517112, 517210, 517410, 517910, 518210, 519110, 519121, 519122, 519130, 519190
Finance, insurance and real estate	521110, 522111, 522112, 522130, 522190, 522210, 522220, 522291, 522299, 522310, 522321, 522329, 522390, 523110, 523120, 523130, 523140, 523210, 523910, 523920, 523930, 523990, 524111, 524112, 524121-524125, 524129, 524131-524135, 524139, 524210, 524291, 524299, 526111, 526112, 526911-529917, 526919, 526930, 526981, 526989, 531111, 531112, 531120, 531130, 531190, 531211, 531212, 531310, 531320, 531390, 532111, 532112, 532120, 532210, 532220, 532230, 532290, 532310, 532410, 532420, 532490, 533110
Architectural, engineering and related services	541310, 541320, 541330, 541340, 541350, 541360, 541370, 541380
Computer system design and related services	541510
Management, scientific and technical consulting services	541611, 541612, 541619, 541620, 541690
Scientific research and development services	541710, 541720
Health care and social assistance	621110, 621210, 621310, 621320, 621330, 621340, 621390, 621410, 621420, 621494, 621499, 621510, 621610, 621911, 621912, 621990, 622111, 622112, 622210, 622310, 623110, 623210, 623221, 623222, 623310, 623991-623993, 623999, 624110, 624120, 624190, 624210, 624220, 624230, 624310, 624410

All other services

541110, 541120, 541190, 541212, 541213, 541215, 541410, 541420,
541430, 541490, 541810, 541820, 541830, 541840, 541850, 541860,
541870, 541891, 541899, 541910, 541920, 541930, 541940, 541990,
551113, 551114, 561110, 561210, 561310, 561320, 561330, 561410,
561420, 561430, 561440, 561450, 561490, 561510, 561520, 561590,
561611-561613, 561621, 561622, 561710, 561721, 561722, 561730,
561740, 561791, 561799, 561910, 561920, 561990, 611110, 611210,
611310, 611410, 611420, 611430, 611510, 611610, 611620, 611630,
611690, 611710, 711111, 711112, 711120, 711130, 711190, 711211,
711213, 711218, 711311, 711319, 711321, 711322, 711329, 711410,
711511, 711512, 711513, 712111, 712115, 712119, 712120, 712130,
712190, 713110, 713120, 713210, 713291, 713299, 713910, 713920,
713930, 713940, 713950, 713990, 721111-721114, 721120, 721191,
721192, 721198, 721211-721213, 721310, 722110, 722210, 722310,
722320, 722330, 722410, 811111, 811112, 811119, 811121, 811122,
811192, 811199, 811210, 811310, 811411, 811412, 811420, 811430,
811490, 812114-812116, 812190, 812210, 812220, 812310, 812320,
812330, 812910, 812921, 812922, 812930, 812990, 813110, 813210,
813310, 813410, 813910, 813920, 813930, 813940, 813990, 814110,
911110, 911210, 911220, 911230, 911240, 911290, 911310, 911320,
911390, 911410, 911420, 911910, 912110, 912120, 912130, 912140,
912150, 912190, 912210, 912910, 913110, 913120, 913130, 913140,
913150, 913190, 913910, 914110, 919110