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Industrial Research and Development: Intentions

2014

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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
0s	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 ($p < 0.05$)

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Highlights

Business enterprises in Canada anticipate spending $15.4 billion to perform research and development (R&D) in 2014, down 0.9% from 2013. Recovery of industrial R&D spending since the 2008 economic downturn remains slow. Since 2008, the only year to year increase in industrial R&D spending occurred in 2011.

In 2014 current R&D spending will be $14.3 billion. Spending on capital R&D, such as machinery, equipment, land and buildings, is anticipated to account for 7% of total industrial R&D spending at $1.1 billion in 2014.

Canadian industrial R&D spending is concentrated with the top 100 business enterprises anticipated to comprise one-half (50%) of all industrial R&D performance in 2014.

The propensity of businesses to perform R&D varies by sector. Research and development was performed by 2.3% of all enterprises in Canada with one or more employees in 2011, the most recent year for which these data are available.

In manufacturing, aerospace products and parts manufacturing ($1.4 billion) and communications equipment manufacturing ($1.3 billion) will lead manufacturing R&D spending, which is expected to total $7.1 billion in 2014, down 0.4% from 2013.

In services, scientific research and development services ($1.9 billion); computer systems design and related services ($1.3 billion); wholesale trade ($1.2 billion); and information and cultural industries ($1.2 billion) will lead R&D spending. R&D spending in services is expected to reach $6.9 billion in 2014, down 0.5% from 2013.

R&D by businesses in oil and gas extraction has increased, from $88 million, in 1999, to $941 million, anticipated for 2014. Similarly, R&D by businesses in scientific research and development services also has increased from $264 million to $1.9 billion over the same period.

Businesses in Canada continued to finance most of their R&D activities through business operations, with internal corporate funds covering $13.8 billion (or 85%) of all industrial R&D spending in 2012.

In 2012, the most recent year for which these data are available, engineering and technology R&D accounted for $12.7 billion (79%) of industrial R&D performed. Natural and formal sciences and medical and health sciences each accounted for 10%, while agricultural sciences comprised the remaining 2%.

While industrial intramural-R&D spending fell slightly between 2011 and 2012, R&D related to energy technologies increased substantially to $2.0 billion, up 18.4% from 2011.

Nationally, industrial R&D spending was $16.2 billion in 2012. Industrial R&D spending in Ontario of $7.3 billion down 4.0% from 2011 and in Quebec of $4.6 billion also down 3.6% from the previous year continued to account for most (74%) of industrial R&D spending performed in 2012. Industrial R&D rose 7.8% to $2.0 billion in Alberta in 2012. The increase was entirely attributable to the mining, oil and gas extraction industry, where R&D spending rose by $234 million.

In 2012, the number of FTE R&D employees totalled 132,156.

Analysis

Business enterprises in Canada anticipate spending $15.4 billion to perform research and development (R&D) in 2014, down 0.9% from 2013. Recovery of industrial R&D spending since the 2008 economic downturn remains slow. Since 2008, the only year to year increase in industrial R&D spending occurred in 2011 (CANSIM 358-0024).

Industrial research and development (R&D) performance consists of two main spending categories: current costs and capital costs. Current costs include wages, salaries and other current costs, such as non-capital purchases of materials required to support R&D activities; security costs; and costs of on-site consultants, who were not employees of the firm, but were performing R&D at the performing firm's facilities. Materials comprise reference materials, such as books, journals and subscriptions to libraries, scientific societies, costs of developing prototypes or models made outside the reporting firm, materials for laboratories, as well as administrative and other overhead cost. Capital expenditures are composed of land, buildings, machinery and equipment.

In 2014 current R&D spending will be $14.3 billion with wages and salaries at $9.5 billion and $4.8 billion directed to other current costs, such as the purchase of non-capital materials, contracts for on-site consultants and products required to support R&D activities. Current R&D spending will represent 93% of total industrial R&D spending (CANSIM 358-0024).

Spending on capital R&D, such as machinery, equipment, land and buildings, is anticipated to account for 7% of total industrial R&D spending at $1.1 billion in 2014. In 2001, spending on R&D capital accounted for 11% of total industrial spending and since then this proportion has been hovering around 7% (CANSIM 358-0024).

Industrial R&D is concentrated

Canadian industrial R&D spending is concentrated with the top 100 business enterprises anticipated to comprise one-half (50%) of all industrial R&D performance in 2014. (table 4)

Six industry groups will account for over half (54%) of industrial R&D spending in 2014, with two of the six industries in manufacturing and four in services. These six key industry groups have been leading industrial R&D performance since 2008 (CANSIM 358-0024).

In manufacturing, aerospace products and parts manufacturing ($1.4 billion) and communications equipment manufacturing ($1.3 billion) will lead manufacturing R&D spending, which is expected to total $7.1 billion in 2014, down 0.4% from 2013 (CANSIM 358-0024).

In services, scientific research and development services ($1.9 billion); computer systems design and related services ($1.3 billion); wholesale trade ($1.2 billion); and information and cultural industries ($1.2 billion) will lead R&D spending. R&D spending in services is expected to reach $6.9 billion in 2014, down 0.5% from 2013. Despite this decline, the share of R&D spending by service industries has generally been expanding since 2001 (CANSIM 358-0024).

Propensity to perform industrial R&D by industry sectors

The propensity of businesses to perform R&D varies by sector also. Research and development was performed by 2.3% of all enterprises in Canada with one or more employees in 2011, the most recent year for which these data are available. The two leading sectors by this R&D propensity measure were the manufacturing sector, which had the highest propensity of enterprises to perform R&D at 18.3%, followed by information and cultural industries at 10.3%. Enterprises in transportation and warehousing were least likely to perform R&D, with 0.4% performing R&D. Retail trade (0.5%) and finance, insurance and real estate (0.6%) also comprised few R&D performers. (Table 14-3)

Shifts in industrial R&D in Canada

Although industrial R&D is highly concentrated by industry, over time this concentration has shifted, reflecting changes in needs and interests. For example, R&D by businesses in oil and gas extraction has increased, from $88 million, in 1999, to $827 million, anticipated for 2014.Similarly, R&D by businesses in scientific research and development services also has increased from $264 million to $1.9 billion over the same period (CANSIM 358-0024).

Aerospace products and parts industry group performed $925 million of industrial R&D in 2007, but for 2014 is anticipating to perform, $1.4 billion (CANSIM 358-0024).

Information and communications technologies (ICT *definition*) historically has been a significant component of industrial R&D in Canada. Peaking in 2001 at $6.1 billion, ICT R&D is anticipated to fall to $4.6 billion in 2014. The decline is mostly attributable to lower R&D spending within communications equipment manufacturing, where R&D spending has fallen from $3.2 billion in 2001 to an anticipated $1.3 billion in 2014 (CANSIM 358-0024).

Industrial R&D in other countries surpass pre-recession highs

The economic uncertainty, which began towards the end of 2008, reduced industrial R&D performance across the Organisation for Economic Co-operation and Development (OECD), with R&D spending declines reported by most member countries in 2009 and 2010. However, by 2011, overall industrial R&D spending by OECD members exceeded the 2008 level, and estimates for 2012 increased further. (Source: OECD (2013), *Main Science and Technology Indictors vol.2–BERD in purchasing power parity dollars*) By 2012, total industrial intramural R&D expenditures across the OECD had increased by over 10% from the levels of 2008.

While Canadian industrial R&D increased in 2011, after contracting in both 2009 and 2010, it has yet to return to levels reported in 2008. Among G-7 countries, France, Germany, Italy and the United States reported increases of over 10%, between 2008 and 2012, while industrial R&D in the United Kingdom followed a pattern more like that of Canada, but still increased slightly from 2008 to 2012.

Canada's business enterprise expenditure on research and development (BERD) to gross domestic product (GDP) ratio reached a peak of 1.3%, in 2001 at the height of the 'tech bubble'. It dropped to 1.2% in 2002. As of 2012, Canada's ratio was 0.9%. In contrast, the overall OECD ratio has risen from 1.5%, in 2004 to 1.6%, in 2012. (Source: OECD, *Main Science and Technology Indictors (2013, vol.2)–BERD as a percentage of GDP*).

In comparison, Australia, like Canada, is a country with a significant resource sector, and moved from a BERD ratio of 0.7%, in 2000 to 1.2%, in 2011. The United States' ratio peaked in 2000 at 1.9%, fell to 1.7%, in 2004, but has since rebounded to 2.0%, in 2012. (Source: OECD, *Main Science and Technology Indictors (2013, vol.2)–BERD as a percentage of GDP*)

Industrial R&D funded predominantly by performing firms

Businesses in Canada continued to finance most of their R&D activities through business operations, with internal corporate funds covering $13.8 billion (or 85%) of all industrial R&D spending in 2012. Funds from foreign sources followed, at $1.7 billion (CANSIM 358-0207).

Funds from government sources increased 6.4% from $605 million in 2011 to $644 million in 2012, as an increase in provincial funding more than offset a decline in federal funding. (CANSIM 358-0207)

Major fields of science or technology

Engineering and technology has remained the dominant major field of science or technology for industrial R&D since 2009, the first year for which data on field of science or technology became available. In 2012, the most recent year for which these data are available, engineering and technology R&D accounted for $12.7 billion (79%) of industrial R&D performed. Natural and formal sciences and medical and health sciences each accounted for 10%, while agricultural sciences comprised the remaining 2% (CANSIM 358-0140).

In 2012, the most significant fields of science or technology as measured by R&D spending, were electrical engineering, electronic engineering and information technology at $3.6 billion, software engineering at $2.6 billion and mechanical engineering at $2.3 billion. Together these three fields of science or technology, each part of the engineering and technology major field of science, comprised more than half (52%) of all industrial R&D (CANSIM 358-0140).

Field of science or technology by sector and industry group

In 2012, industries with high levels of spending in engineering and technology reflected the highest R&D performing industries overall, led by aerospace ($1.5 billion), communications equipment manufacturing ($1.5 billion) and scientific research and development services ($1.2 billion) within this major field of science or technology. (CANSIM 358-0140).

Different industry groups predominated within the three fields of science or technology with the highest overall R&D spending. Electrical engineering, electronic engineering and information technology ($3.6 billion) was performed principally by enterprises in communications equipment manufacturing ($978 million), scientific research and development services ($671 million), wholesale trade ($400 million), information and cultural services ($328 million) and navigational, measuring, medical and control instruments manufacturing ($263 million) (CANSIM 358-0140).

The majority of software engineering R&D ($2.6 billion) was undertaken in computer systems design and related services ($674 million), information and cultural industries($596 milion) and scientific research and development services ($209 million) (CANSIM 358-0140).

Manufacturing industries ($1.7 billion) comprised the largest share of the $2.3 billion dedicated to mechanical engineering R&D) in 2012. Mechanical engineering R&D was down from $2.8 billion in 2011 to $2.3 billion in 2012 due to declining spending by manufacturers (CANSIM 358-0140).

Of the $1.5 billion spent on R&D in natural and formal sciences the largest share was undertaken by enterprises in service industries, $912 million (59%). This was followed by the manufacturing sector, which accounted for $391 million (25%) (CANSIM 358-0140).

R&D spending in medical and health sciences reached $1.6 billion in 2012, with four industries accounting for 91% of such R&D spending: scientific research and development services ($522 million), wholesale trade ($493 million), pharmaceuticals and medicine manufacturing ($360 million) and health care and social assistance ($66 million) (CANSIM 358-0140).

Research and development in agricultural sciences was divided between the manufacturing sector (42%), service industries (33%), and all other sectors (26%) (CANSIM 358-0140).

In 2012, $745 million was spent on environmental engineering and $280 million on earth and related environmental sciences R&D. Mining, oil and gas extraction performed 64% ($178 million) of all R&D spending in earth and related environmental sciences, as well as 77% ($577 million) of spending in environmental engineering R&D (CANSIM 358-0140).

Industries within which research and development activities were most broadly distributed across the major fields of science and technology included wholesale trade and research and development services. Just over one half (52%) of the $1.3 billion in R&D performed by enterprises in wholesale trade in 2012 was attributed to engineering technologies, while medical and health sciences accounted for 40%, with the remainder split between agricultural sciences (6%) and natural sciences (5%). Enterprises in scientific research and development services performed $1.9 billion in 2012, of which engineering technologies accounted for 63%, followed by medical and health sciences (28%), natural sciences (7%), and agricultural sciences (2%) (CANSIM 358-0140).

Energy R&D increased

While industrial intramural R&D spending fell slightly between 2011 and 2012, R&D related to energy technologies increased substantially to $2.0 billion, up 18.4% from 2011.This increase was largely attributable to increases in R&D related to fossil fuels technologies, which increased by 24.9% to $1.5 billion in 2012. R&D relating to fossil fuels technologies was concentrated in two areas: oil sands and heavy crude oil technologies, which increased by 53.6% to $886 million as well as crude oil and natural gas technologies, which remained almost unchanged at$554 million (up from $553 million from 2011) (CANSIM 358-0214).

R&D related to electric power technologies rose by 9.9% to $100 million in 2012 (CANSIM 358-0214).

In contrast, R&D spending for energy efficiency technologies fell 5.9% to $80 million and renewable energy resources technologies fell 18.9% to $86 million between 2011 and 2012 (CANSIM 358-0214).

R&D spending by province

Nationally, industrial R&D spending was $16.2 billion in 2012. Industrial R&D spending in Ontario of $7.3 billion was down 4.0% from 2011 and in Quebec spending of $4.6 billion was also down 3.6% from the previous year.Spending in these provinces continued to account for most (74%) of industrial R&D spending performed in 2012. Ontario experienced declines in R&D spending across most sectors. The decline in Quebec occurred mainly in the services (CANSIM 358-0161).

Industrial R&D rose 7.8% to $2.0 billion in Alberta in 2012. The increase was entirely attributable to the mining, oil and gas extraction sector, where R&D spending rose by $234 million (CANSIM 358-0161).

In Manitoba, industrial R&D spending increased 9.7% in 2012 to $215 million, mainly as a result of higher spending in the manufacturing sector. Meanwhile, R&D spending in Saskatchewan fell 2.6% from 2011 to $188 million in 2012, as current R&D spending—spending on wages, salaries and other current costs—edged down (CANSIM 358-0161).

British Columbia also experienced lower industrial R&D spending in 2012, down 4.4% from the previous year to $1.6 billion. Spending on R&D in services industries declined, most notably in scienctific R&D services which decreased from $300 million to $266 million and information and cultural industries which decreased from $168 million to $143 million, offsetting a moderate rise in the province's manufacturing sector (CANSIM 358-0161).

Newfoundland and Labrador ($95 million) and Nova Scotia ($81 million) continued to spend the most in R&D among the Atlantic provinces. Spending on industrial R&D in Prince Edward Island was also up, reaching $24 million in 2012 (CANSIM 358-0161).

In contrast, industrial R&D spending in New Brunswick declined 29.6% to $69 million between 2011 and 2012, mostly as a result of declines in R&D spending in services industries (CANSIM 358-0161).

Research and development personnel

In 2003, the number of research and development (R&D) personnel was 127,230 full-time equivalents (FTE). Similar to R&D spending, R&D personnel rose steadily until 2008 when it peaked at 172,744 FTEs. In 2009, the number of FTE R&D employees began to decline, and totalled 132,156 in 2012 (CANSIM 358-0024).

R&D personnel are classified into three categories: professional, technicians and other. The 'professional' category includes researchers, such as scientists and engineers, and R&D administrators. 'Technicians' includes technicians, technologists, and trained staff who assist scientists and engineers in R&D. 'Other' R&D personnel consist of administrative support staff directly engaged in R&D activities. In 2012, R&D personnel were 67% professionals, 25% technicians and 8% other employees (CANSIM 358-0024).

In 2012, 70,044 R&D personnel worked inservice industries. Computer systems design and related services employed the most R&D personnel (16,692 FTEs), followed by scientific research and experimental development services (14,273 FTEs) (CANSIM 358-0024).

The manufacturing sector employed 56,445 R&D FTEs in 2012. The communications equipment industry had the most FTEs working in R&D (8,684), followed by the aerospace industry with 7,294 (CANSIM 358-0024).

At the provincial level, Ontario employed 61,200 R&D FTEs (46%) in 2012, Quebec 42,951 (33%) and British Columbia and Alberta 14,167 (11%) and 7,774 (6%) respectively. Manitoba employed 1,787 R&D FTEs. In the Atlantic provinces in 2012, the number of FTE R&D employees was as follows, in order: Nova Scotia (980), New Brunswick (867), Newfoundland and Labrador (617) and Prince Edward Island (256) (CANSIM 358-0161).

Technology payments

Businesses that either perform or fund R&D also made and received payments for the use of technologies. Expenditures for technology, in 2012, were $952 million, while receipts were $1.6 billion. Expenditures for patents ($563 million) accounted for the largest share of expenditures in intellectual property, while payments for technical assistance, industrial processes and know-how accounted for most of the remaining technology payments, at $320 million. Receipts from payments for technology followed a similar pattern, with patents accounting for the largest amount ($1.0 billion) and technical assistance, industrial processes and know-how, accounting for most of the remainder ($512 million) (CANSIM 358-0212).

Related products

Selected publications from Statistics Canada

88-001-X	Science Statistics
88-221-X	Gross Domestic Expenditures on Research and Development in Canada (GERD), and the Provinces
88-522-X	Science and Technology Activities and Impacts: A Framework for a Statistical Information
88F0006X	BSSTSD, Working Papers

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
358-0140	Business enterprise research and development (R&D) characteristics, by field of science or technology and North American Industry Classification System (NAICS)
358-0161	Business enterprise research and development (BERD) characteristics, by industry group based on the North American Industry Classification System (NAICS), provinces and Territories, annual
358-0205	Business enterprise intramural research and development expenditures, by country of control and North American Industry Classification System (NAICS)
358-0206	Business enterprise extramural payments for research and development, by location of recipient and North American Industry Classification System (NAICS)
358-0207	Business enterprise intramural research and development expenditures, by sources of funds
358-0208	Business enterprise intramural research and development expenditures, by performing research and development company employment size
358-0209	Business enterprise intramural research and development expenditures, by performing research and development company revenue size
358-0210	Business enterprise intramural research and development expenditures, by research and development expenditure size
358-0211	Business enterprise current intramural research and development expenditures as a percentage of performing research and development company revenues, by country of control and North American Industry Classification System (NAICS)

358-0212	Business enterprise expenditures made and payments received for intellectual property and other technology assistance
358-0213	Business enterprise foreign receipts and payments for technological services
358-0214	Industrial energy research and development expenditures and extramural payments outside Canada, by area of technology

Selected surveys from Statistics Canada

4201	Research and Development in Canadian Industry
4205	Energy Research and Development Expenditures by Area of Technology

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

Business enterprise research and development expenditures in current and 2007 constant dollars

	Current dollars			Gross domestic product implicit price index (2007)	2007 constant dollars		
	Current intramural expenditures	Capital expenditures	Total intramural expenditures		Current intramural expenditures	Capital expenditures	Total intramural expenditures
	millions of dollars			index = 2007	millions of dollars		
2014 p	14,300 A	1,101 C	**15,401** A	..	..	..	..
2013 p	14,329 A	1,206 B	**15,535** A	111.0	12,909 A	1,086 B	**13,995** A
2012 p	14,694 A	1,459 A	**16,153** A	109.5	13,419 A	1,332 A	**14,752** A
2011 r	15,483 A	1,063 A	**16,545** A	107.7	14,376 A	987 A	**15,362** A
2010 r	14,871 A	932 A	**15,803** A	104.4	14,244 A	893 A	**15,137** A
2009	15,043	995	**16,038**	101.7	14,792	978	**15,770**
2008	15,569	1,075	**16,644**	103.9	14,985	1,035	**16,019**
2007	15,651	1,105	**16,756**	100.0	15,651	1,105	**16,756**
2006	15,318	1,155	**16,474**	96.9	15,808	1,192	**17,001**
2005	14,572	1,067	**15,638**	94.3	15,453	1,131	**16,583**
2004	14,095	1,049	**15,144**	91.4	15,421	1,148	**16,569**
2003	13,110	985	**14,094**	88.5	14,814	1,113	**15,925**
2002	12,492	1,052	**13,545**	85.6	14,593	1,229	**15,824**
2001	12,767	1,499	**14,266**	84.6	15,091	1,772	**16,863**
2000	11,201	1,194	**12,395**	83.2	13,463	1,435	**14,898**
1999	9,360	1,039	**10,399**	79.8	11,729	1,302	**13,031**
1998	8,727	955	**9,682**	78.4	11,131	1,218	**12,349**
1997	7,874	865	**8,739**	78.5	10,031	1,102	**11,132**
1996	7,159	838	**7,997**	77.6	9,226	1,080	**10,305**
1995	7,286	705	**7,991**	76.3	9,549	924	**10,473**
1994	6,938	629	**7,567**	74.6	9,300	843	**10,143**
1993	5,878	546	**6,424**	73.6	7,986	742	**8,728**
1992	5,286	457	**5,742**	72.6	7,281	629	**7,909**
1991	4,812	543	**5,355**	71.5	6,730	759	**7,490**
1990	4,541	628	**5,169**	69.4	6,543	905	**7,448**

Note(s): Components may not add to totals due to rounding.
Source(s): CANSIM tables 358-0024 and 380-0102.

Table 2

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

	2012 [p]	2011 [r]	2010 [r]	2009	2000
	percent				
Israel	3.54	3.54	3.51	3.68	3.37
Korea	..	3.09	2.80	2.64	1.70
Japan	..	2.61	2.49	2.54	2.13
Finland	2.44	2.68	2.72	2.81	2.37
Sweden	2.31	2.33	2.33	2.55	..
Switzerland	2.17	..	..	..	1.82
Denmark	1.96	1.96	2.01	2.21	..
Germany	1.95	1.96	1.88	1.91	1.74
United States	1.95	1.89	1.87	1.96	1.94
Austria	1.95	1.90	1.91	1.84	..
Belgium	1.52	1.52	1.41	1.34	1.42
France	1.45	1.44	1.42	1.40	1.34
Australia	..	1.24	1.28	1.30	0.70
Netherlands	1.22	1.14	0.89	0.85	1.07
Ireland	1.20	1.14	1.16	1.15	0.80
Slovenia	2.16	1.83	1.43	1.20	0.78
United Kingdom	1.09	1.13	1.08	1.10	1.17
Czech Republic	1.01	0.91	0.81	0.76	0.70
Luxembourg	1.00	1.00	1.02	1.32	1.53
Canada	**0.90**	**0.93**	**0.95**	**1.05**	**1.15**
Norway	0.87	0.86	0.86	0.91	..
Spain	0.69	0.71	0.72	0.72	0.49
Italy	0.69	0.68	0.68	0.67	0.52
OECD total	**1.62**	**1.59**	**1.56**	**1.59**	**1.51**

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 2013/2.

Table 3

Business enterprise research and development expenditures 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	
2014 [p]	15,401 [A]	..	..	..	..
2013 [p]	15,535 [A]	30,448	1,881,200 [r]	51.02	0.83
2012 [p]	16,153 [A]	30,727	1,819,967 [r]	52.57	0.89
2011 [r]	16,545 [A]	30,696	1,760,011 [r]	53.90	0.94
2010 [r]	15,803 [A]	30,219	1,662,757 [r]	52.29	0.95

Source(s): CANSIM tables 358-0001, 380-0064 and 358-0024.

Table 4
Concentration of business enterprise research and development intramural expenditures by top performers

	Top 25	Top 50	Top 75	Top 100	Total intramural expenditures
	percent				millions of dollars
2014 p	33	41	46	50	**15,401** A
2013 p	33	41	47	51	**15,535** A
2012 p	35	43	48	53	**16,153** A
2011 r	33	41	46	50	**16,545** A
2010 r	30	39	44	48	**15,803** A
2009	29	38	43	47	**16,038** A
2008	28	38	44	48	**16,644** A
2007	29	38	44	48	**16,756**
2006	31	42	48	51	**16,474**
2005	32	42	49	52	**15,638**
2004	33	43	49	53	**15,144**
2003	34	44	50	54	**14,094**
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**

Table 5-1

Business enterprise research and development intramural expenditures — By industry

	2010 r	2011 r	2012 p	2013 p	2014 p
	millions of dollars				
Total all industries	**15,803** A	**16,545** A	**16,153** A	**15,535** A	**15,401** A
Agriculture, forestry, fishing and hunting	**131** A	**124** A	**95** A	**92** B	**94** B
Agriculture	111 A	101 A	85 A	82 B	83 B
Forestry, logging and support activities for forestry	12 D	15 A	6 A	6 D	6 C
Fishing, hunting, trapping and animal aquaculture	8 A	7 A	5 A	5 B	5 B
Mining and oil and gas extraction	**981** D	**1,044** A	**1,244** A	**994** B	**941** E
Oil and gas extraction, contract drilling and related services	889 C	909 A	1,104 A	853 A	827 E
Mining and related support activities	F	136 A	140 A	141 D	F
Total utilities	**188** A	**193** A	**230** A	**237** A	**214** A
Electric power generation, transmission and distribution	155 A	165 A	203 A	212 A	191 A
Other utilities	33 A	28 A	27 A	24 C	24 C
Construction	**113** A	**137** A	**100** A	**103** C	**105** C
Manufacturing	**7,334** A	**7,577** A	**7,434** A	**7,159** A	**7,131** A
Food manufacturing	178 A	151 A	135 A	131 A	142 B
Beverage and tobacco product manufacturing	16 A	x	x	x	10 C
Textiles	42 A	41 A	31 A	30 B	33 D
Wood product manufacturing	87 A	88 A	73 A	60 C	59 B
Paper manufacturing	151 A	143 A	133 A	F	139 C
Printing and related support activities	53 A	44 B	40 A	39 B	40 B
Petroleum and coal products manufacturing	333 A	x	x	x	x
Pharmaceutical and medicine manufacturing	668 A	507 B	502 C	509 A	537 B
Other chemicals	352 C	303 A	208 A	180 C	184 D
Plastic product manufacturing	133 A	147 A	140 A	145 C	143 B
Rubber product manufacturing	21 A	19 C	x	x	x
Non-metallic mineral product manufacturing	76 A	75 A	60 A	63 D	68 B
Primary metal (ferrous)	F	43 A	37 A	33 B	34 D
Primary metal (non-ferrous)	150 A	167 A	161 A	99 B	88 A
Fabricated metal product manufacturing	234 A	211 A	185 A	186 C	181 B
Machinery manufacturing	554 A	636 C	588 A	651 A	669 A
Computer and peripheral equipment manufacturing	55 A	52 A	53 A	56 A	55 A
Communications equipment manufacturing	1,078 A	1,475 A	1,483 D	1,387 A	1,343 A
Semiconductor and other electronic component manufacturing	528 A	521 A	481 A	473 A	473 A
Navigational, measuring, medical and control instrument manufacturing	437 C	371 A	430 A	414 A	412 A
Other computer and electronic products	26 A	25 A	33 A	35 C	35 D
Electrical equipment, appliance and component manufacturing	159 A	145 A	131 A	139 B	133 B
Motor vehicle and parts	313 A	251 A	240 A	218 A	244 B
Aerospace products and parts manufacturing	1,228 D	1,308 D	1,455 A	1,393 A	1,421 A
All other transportation equipment	166 A	185 A	150 A	159 A	158 A
Furniture and related product manufacturing	43 A	35 A	29 A	28 B	29 B
Other manufacturing industries	209 A	204 A	208 A	218 B	229 B
Services	**7,056** A	**7,470** A	**7,049** A	**6,951** A	**6,914** A
Wholesale trade	1,291 A	1,371 A	1,334 A	1,209 A	1,198 A
Retail trade	61 A	69 A	51 A	60 C	63 C
Transportation and warehousing	68 A	54 A	61 A	61 B	63 A
Information and cultural industries	1,235 A	1,118 B	1,122 A	1,139 A	1,168 A
Finance, insurance and real estate	268 A	243 A	273 A	253 B	249 A
Architectural, engineering and related services	389 A	469 A	499 A	522 B	489 B
Computer systems design and related services	1,344 A	1,518 A	1,281 A	1,276 B	1,256 A
Management, scientific and technical consulting services	85 A	89 A	81 A	91 C	91 D
Scientific research and development services	1,837 A	2,014 A	1,881 A	1,875 B	1,859 A
Health care and social assistance	98 B	93 A	81 A	85 B	97 E
All other services	379 A	432 A	384 A	379 C	380 B

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

Table 5-2
Business enterprise research and development intramural expenditures — By province

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Total	**16,644** A	**16,038** A	**15,803** A	**16,545** A	**16,153** A
Atlantic Canada	330 A	337 A	268 A	268 A	269 A
Newfoundland and Labrador	90 A	87 B	66 A	75 A	95 B
Prince Edward Island	15 C	13 D	12 A	13 B	24 A
Nova Scotia	105 A	110 B	89 A	82 B	81 B
New Brunswick	121 B	127 B	101 A	98 B	69 A
Quebec	4,794 A	4,757 B	4,764 A	4,869 B	4,692 A
Ontario	7,883 A	7,384 A	7,193 A	7,569 A	7,268 A
Manitoba	182 A	209 C	224 A	196 B	215 B
Saskatchewan	146 B	155 B	162 A	193 A	188 A
Alberta	1,618 A	1,571 A	1,530 A	1,809 A	1,951 A
British Columbia and Territories [1]	1,691 A	1,626 A	1,664 A	1,642 A	1,570 A

1. Includes Yukon, Northwest Territories and Nunavut.
Note(s): Components may not add to totals due to rounding.

Table 5-3
Business enterprise research and development intramural expenditures — By province and by type of expenditures, 2012p

	Total business enterprise research and development current expenditures	Total business enterprise research and development capital expenditures	Total business enterprise research and development intramural expenditures
	millions of dollars		
Total	**14,694** A	**1,459** A	**16,153** A
Atlantic Canada	249 A	20 D	269 A
Newfoundland and Labrador	88 C	F	95 B
Prince Edward Island	20 A	4 A	24 A
Nova Scotia	75 B	6 D	81 B
New Brunswick	67 A	2 B	69 A
Quebec	4,384 A	308 A	4,692 A
Ontario	6,894 A	374 A	7,268 A
Manitoba	205 A	11 D	215 B
Saskatchewan	177 B	11 D	188 A
Alberta	1,306 A	645 A	1,951 A
British Columbia and Territories [1]	1,479 A	91 A	1,570 A

1. Includes Yukon, Northwest Territories and Nunavut.
Note(s): Components may not add to totals due to rounding.

Table 5-4
Business enterprise research and development intramural expenditures — By industry, by region, 2012[p]

	Atlantic Canada	Quebec	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia and Territories [1]	Total
	millions of dollars							
Total all industries	**269** [A]	**4,692** [A]	**7,268** [A]	**215** [B]	**188** [A]	**1,951** [A]	**1,570** [A]	**16,153** [A]
Agriculture, forestry, fishing and hunting	**9** [A]	**36** [A]	**23** [A]	**4** [A]	**x**	**x**	**x**	**95** [A]
Agriculture	x	35 [A]	22 [A]	4 [A]	x	x	12 [A]	85 [A]
Forestry, logging and support activities for forestry	x	x	x	0 [A]	0 [A]	x	x	6 [A]
Fishing, hunting, trapping and animal aquaculture	x	x	x	0 [A]	0 [A]	0 [A]	x	5 [A]
Mining and oil and gas extraction	**41** [A]	**22** [A]	**72** [A]	**x**	**x**	**868** [A]	**210** [A]	**1,244** [A]
Oil and gas extraction, contract drilling and related services	x	x	x	x	x	x	x	1,104 [A]
Mining and related support activities	x	x	x	x	13 [A]	x	x	140 [A]
Utilities	**11** [A]	**107** [A]	**79** [A]	**x**	**x**	**x**	**x**	**230** [A]
Electric power generation, transmission and distribution	x	x	x	x	x	x	x	203 [A]
Other utilities	x	x	x	x	x	x	x	27 [A]
Construction	**1** [A]	**23** [A]	**50** [A]	**x**	**2** [A]	**15** [A]	**x**	**100** [A]
Manufacturing	**76** [C]	**2,573** [A]	**3,650** [A]	**101** [C]	**74** [B]	**539** [A]	**422** [A]	**7,434** [A]
Food manufacturing	x	53 [A]	55 [A]	x	4 [A]	x	14 [A]	135 [A]
Beverage and tobacco product manufacturing	x	x	x	x	0 [A]	x	x	x
Textiles	x	16 [A]	11 [A]	x	x	0 [A]	2 [A]	31 [A]
Wood product manufacturing	x	15 [A]	14 [A]	x	x	19 [A]	18 [A]	73 [A]
Paper manufacturing	12 [A]	84 [A]	26 [A]	x	0 [A]	x	7 [A]	133 [A]
Printing and related support activities	0 [A]	18 [A]	19 [A]	1 [A]	x	x	x	40 [A]
Petroleum and coal products manufacturing	x	x	8 [B]	x	x	x	F	x
Pharmaceutical and medicine manufacturing	x	156 [C]	243 [B]	x	x	x	40 [E]	502 [C]
Other chemicals	F	39 [D]	123 [B]	3 [C]	21 [B]	17 [D]	F	208 [A]
Plastic product manufacturing	1 [A]	32 [A]	94 [A]	3 [A]	0 [A]	8 [A]	3 [A]	140 [A]
Rubber product manufacturing	x	x	8 [A]	x	x	x	x	x
Non-metallic mineral product manufacturing	x	21 [A]	21 [A]	x	0 [A]	x	x	60 [A]
Primary metal (ferrous)	0 [A]	3 [A]	25 [A]	x	x	x	0 [A]	37 [A]
Primary metal (non-ferrous)	0 [A]	x	26 [A]	x	x	x	x	161 [A]
Fabricated metal product manufacturing	4 [A]	56 [A]	100 [A]	2 [A]	3 [A]	11 [A]	10 [A]	185 [A]
Machinery manufacturing	7 [A]	215 [A]	280 [A]	11 [A]	20 [C]	26 [B]	29 [A]	588 [A]
Computer and peripheral equipment manufacturing	x	12 [A]	28 [A]	x	0 [A]	x	9 [A]	53 [A]
Communications equipment manufacturing	x	103 [A]	1,336 [A]	x	x	x	27 [B]	1,483 [D]
Semiconductor and other electronic component manufacturing	x	69 [C]	306 [A]	F	x	F	93 [B]	481 [A]
Navigational, measuring, medical and control instrument manufacturing	6 [B]	89 [A]	272 [A]	x	x	17 [A]	44 [A]	430 [A]
Other computer and electronic products	x	17 [A]	x	0 [A]	0 [A]	0 [A]	x	33 [A]
Electrical equipment, appliance and component manufacturing	x	40 [A]	48 [A]	x	2 [A]	x	35 [A]	131 [A]
Motor vehicle and parts	x	29 [A]	174 [A]	2 [A]	2 [A]	x	x	240 [A]
Aerospace products and parts manufacturing	1 [A]	x	302 [A]	x	0 [A]	x	5 [A]	1,455 [A]
All other transportation equipment	x	114 [A]	30 [A]	x	0 [A]	x	3 [A]	150 [A]
Furniture and related product manufacturing	x	11 [A]	16 [A]	0 [A]	x	x	1 [A]	29 [A]
Other manufacturing industries	x	102 [B]	70 [B]	6 [B]	0 [A]	x	24 [D]	208 [A]
Services	**131** [A]	**1,931** [A]	**3,395** [A]	**105** [A]	**80** [A]	**499** [A]	**907** [A]	**7,049** [A]
Wholesale trade	22 [B]	319 [A]	751 [A]	29 [B]	24 [C]	88 [A]	102 [B]	1,334 [A]
Retail trade	x	14 [A]	25 [A]	x	x	3 [A]	7 [A]	51 [A]
Transportation and warehousing	2 [A]	10 [A]	17 [A]	x	x	29 [A]	3 [A]	61 [A]
Information and cultural industries	x	246 [A]	599 [A]	x	x	78 [C]	143 [B]	1,122 [A]
Finance, insurance and real estate	6 [A]	37 [A]	156 [A]	x	x	41 [A]	30 [A]	273 [A]
Architectural, engineering and related services	9 [B]	92 [A]	249 [A]	2 [D]	10 [C]	79 [A]	57 [A]	499 [A]
Computer systems design and related services	26 [A]	403 [B]	547 [B]	16 [B]	6 [C]	42 [A]	242 [B]	1,281 [A]
Management, scientific and technical consulting services	2 [A]	21 [A]	31 [A]	x	x	15 [A]	11 [A]	81 [A]
Scientific research and development services	35 [B]	637 [A]	843 [A]	11 [B]	21 [A]	69 [B]	266 [A]	1,881 [A]
Health care and social assistance	2 [A]	33 [A]	29 [A]	x	x	2 [A]	13 [A]	81 [A]
All other services	11 [C]	121 [A]	149 [A]	3 [A]	13 [D]	54 [A]	33 [A]	384 [A]

1. Includes Yukon, Northwest Territories and Nunavut.
Note(s): Components may not add to totals due to rounding.

Table 5-5
Business enterprise research and development intramural expenditures — By major industrial sectors, Atlantic Canada

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Atlantic Canada	**330** A	**337** A	**268** A	**268** A	**269** A
Agriculture, forestry, fishing and hunting	x	12 A	9 A	7 A	9 A
Mining and oil and gas extraction	x	40 A	x	x	41 A
Utilities	x	10 B	x	x	11 A
Construction	2 A	3 A	x	x	1 A
Manufacturing	185 B	149 A	115 A	84 A	76 C
Services	124 A	122 B	116 A	150 A	131 A

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

Table 5-6
Business enterprise research and development intramural expenditures — By major industrial sectors, Quebec

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Quebec	**4,794** A	**4,757** B	**4,764** A	**4,869** B	**4,692** A
Agriculture, forestry, fishing and hunting	48 A	40 A	x	34 A	36 A
Mining and oil and gas extraction	x	x	x	x	22 A
Utilities	x	x	x	x	107 A
Construction	x	43 A	x	32 A	23 A
Manufacturing	2,231 A	2,357 D	2,456 A	2,507 D	2,573 A
Services	2,353 A	2,195 A	2,125 A	2,155 A	1,931 A

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

Table 5-7
Business enterprise research and development intramural expenditures — By major industrial sectors, Ontario

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Ontario	**7,883** A	**7,384** A	**7,193** A	**7,569** A	**7,268** A
Agriculture, forestry, fishing and hunting	48 A	46 A	52 A	41 A	23 A
Mining and oil and gas extraction	13 A	61 A	51 A	81 A	72 A
Utilities	74 A	46 A	62 A	70 A	79 A
Construction	53 A	57 A	50 B	74 A	50 A
Manufacturing	4,270 A	4,227 B	3,663 A	3,788 B	3,650 A
Services	3,425 A	2,947 A	3,314 A	3,514 A	3,395 A

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

Table 5-8
Business enterprise research and development intramural expenditures — By major industrial sectors, Manitoba

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Manitoba	**182** A	**209** C	**224** A	**196** B	**215** B
Agriculture, forestry, fishing and hunting	4 A	4 A	8 A	x	4 A
Mining and oil and gas extraction	x	2 A	x	0 A	x
Utilities	x	1 D	x	x	x
Construction	x	1 A	1 A	x	x
Manufacturing	108 A	80 D	84 A	82 D	101 C
Services	63 A	121 B	128 A	106 A	105 A

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

Table 5-9
Business enterprise research and development intramural expenditures — By major industrial sectors, Saskatchewan

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Saskatchewan	**146** B	**155** B	**162** A	**193** A	**188** A
Agriculture, forestry, fishing and hunting	5 A	5 A	x	x	x
Mining and oil and gas extraction	34 A	x	20 A	x	x
Utilities	1 C	x	x	x	x
Construction	1 A	x	x	x	2 A
Manufacturing	53 E	69 B	68 A	76 B	74 B
Services	51 A	62 D	63 A	86 B	80 A

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

Table 5-10
Business enterprise research and development intramural expenditures — By major industrial sectors, Alberta

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Alberta	**1,618** A	**1,571** A	**1,530** A	**1,809** A	**1,951** A
Agriculture, forestry, fishing and hunting	x	3 B	4 B	x	x
Mining and oil and gas extraction	592 A	480 A	496 A	634 A	868 A
Utilities	x	14 D	x	x	x
Construction	18 A	19 A	x	16 A	15 A
Manufacturing	485 B	488 A	576 A	643 A	539 A
Services	489 A	567 B	436 A	509 B	499 A

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

Table 5-11
Business enterprise research and development intramural expenditures — By major industrial sectors, British Columbia

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
British Columbia and Territories [1]	**1,691** A	**1,626** A	**1,664** A	**1,642** A	**1,570** A
Agriculture, forestry, fishing and hunting	15 A	16 A	16 A	30 A	x
Mining and oil and gas extraction	312 A	309 A	377 A	x	210 A
Utilities	x	x	x	x	x
Construction	x	x	x	x	x
Manufacturing	392 C	395 B	374 A	399 B	422 A
Services	962 A	882 A	875 A	950 A	907 A

1. Includes Yukon, Northwest Territories and Nunavut.

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

Table 5-12
Business enterprise research and development intramural expenditures — By country of control

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Total country of control	**16,644**	**16,038** A	**15,803** A	**16,545** A	**16,153** A
Canada	10,505	10,720 A	10,256 A	10,894 A	10,179 A
Foreign	**6,139**	**5,318** A	**5,548** B	**5,651** A	**5,974** A
United States	3,857	3,017 A	3,114 A	3,283 A	3,524 A
Other foreign	2,282	2,301 A	2,434 C	2,369 A	2,450 A

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

Table 5-13

Business enterprise research and development intramural expenditures — Of Canadian-controlled companies compared to all intramural research and development expenditures, by industry

	2008	2009	2010 r	2011 r	2012 p
	percent				
Total all industries	**63**	**67**	**65**	**66**	**63**
Agriculture, forestry, fishing and hunting	**x**	**x**	**70**	**74**	**x**
Agriculture	x	x	x	69	x
Forestry and logging	x	100	100	100	100
Fishing, hunting and trapping	x	x	x	100	100
Mining and oil and gas extraction	**55**	**41**	**53**	**62**	**53**
Oil and gas extraction	56	43	55	67	55
Mining	54	28	37	24	41
Utilities	**99**	**99**	**99**	**99**	**99**
Electric power	x	x	x	x	99
Other utilities	x	x	x	x	98
Construction	**x**	**x**	**93**	**89**	**x**
Manufacturing	**62**	**66**	**63**	**65**	**65**
Food	72	83	82	83	78
Beverage and tobacco	59	61	66	x	x
Textile	74	77	81	84	x
Wood products	87	79	82	79	99
Paper	47	40	44	51	62
Printing	93	x	97	x	95
Petroleum and coal products	x	x	x	x	x
Pharmaceutical and medicine	52	41	41	40	49
Other chemicals	57	58	34	35	44
Plastic products	83	82	85	82	72
Rubber products	47	42	46	52	x
Non-metallic mineral products	59	57	56	42	x
Primary metal (ferrous)	15	17	23	20	x
Primary metal (non-ferrous)	16	78	22	21	12
Fabricated metal products	85	91	91	90	88
Machinery	80	80	89	82	84
Computer and peripheral equipment	49	52	53	55	x
Communications equipment	87	86	88	85	88
Semiconductor and other electronic components	x	x	x	x	26
Navigational, measuring, medical and control instruments	52	39	39	44	35
Other computer and electronic products	x	x	x	x	x
Electrical equipment, appliance and components	63	46	52	57	66
Motor vehicle and parts	41	50	64	62	46
Aerospace products and parts	x	x	x	x	x
All other transportation equipment	x	x	x	91	64
Furniture and related products	97	98	97	x	x
Other manufacturing industries	93	83	76	86	75
Services	**63**	**69**	**67**	**66**	**61**
Wholesale trade	26	36	44	44	22
Retail trade	x	x	x	x	x
Transportation and warehousing	x	98	x	99	100
Information and cultural industries	69	78	83	80	77
Finance, insurance and real estate	56	51	89	88	87
Architectural, engineering and related services	91	85	84	83	83
Computer system design and related services	74	86	77	79	75
Management, scientific and technical consulting services	96	99	99	x	x
Scientific research and development services	70	66	53	48	48
Health care and social assistance	43	x	x	x	x
All other services	88	91	79	82	88

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

Table 5-14
Business enterprise research and development intramural expenditures — By expenditures size [1]

	2008	2009	2010 [r]	2011 [r]	2012 [p]
	millions of dollars				
Total research and development expenditure size	**16,644**	**16,038** [A]	**15,803** [A]	**16,545** [A]	**16,153** [A]
Less than $50,000	225	244 [E]	234 [A]	212 [A]	179 [A]
$50,000 to $99,999	409	434 [C]	417 [A]	384 [A]	328 [A]
$100,000 to $199,999	688	720 [A]	696 [B]	642 [A]	564 [A]
$200,000 to $399,999	862	946 [A]	902 [C]	876 [A]	766 [A]
$400,000 to $999,999	1,304	1,364 [A]	1,303 [A]	1,296 [A]	1,302 [A]
$1,000,000 or greater	13,157	12,329 [A]	12,251 [A]	13,135 [A]	13,014 [A]

1. Research and development expenditures size is based on current intramural expenditures.
Note(s): Components may not add to totals due to rounding.

Table 5-15
Business enterprise research and development intramural expenditures — By sources of funds

	Canadian business enterprises			Federal sources		Provincial	Other Canadian sources	Foreign	**Total sources of funds**
	Performing Research and development companies	Related companies	Research and development contracts for other companies	Federal grants	Federal contracts				
	millions of dollars								
2012 [p]	13,229 [A]	410 [A]	125 [C]	247 [A]	105 [B]	292 [A]	21 [B]	1,725 [A]	**16,153** [A]
2011 [r]	13,552 [A]	434 [A]	172 [C]	380 [A]	68 [A]	157 [C]	31 [A]	1,752 [C]	**16,545** [A]
2010 [r]	12,424 [A]	800 [A]	119 [A]	326 [A]	101 [A]	163 [A]	18 [B]	1,853 [A]	**15,803** [A]
2009	12,987 [A]	431 [A]	149 [A]	266 [A]	38 [A]	148 [A]	15 [B]	2,003 [A]	**16,038** [A]
2008	13,175	789	165	284	35	71	44	2,082	**16,644**
2007	13,013	520	145	216	37	97	65	2,663	**16,756**
2006	13,283	463	173	221	38	155	28	2,113	**16,474**
2005	12,342	401	131	289	34	90	25	2,327	**15,638**
2004	12,018	350	149	228	43	59	18	2,280	**15,144**
2003	11,102	379	153	256	44	70	17	2,073	**14,094**
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**

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

Table 5-16
Business enterprise research and development intramural expenditures — By sources of funds and by industry, 2012p

	Canadian performing companies	Government and other Canadian sources	Foreign sources	Total sources of funds
	millions of dollars			
Total all industries	**13,229** A	**1,199** A	**1,725** A	**16,153** A
Agriculture, forestry, fishing and hunting	**89** A	**x**	**x**	**95** A
Agriculture	79 A	x	x	85 A
Forestry and logging	6 A	0 A	0 A	6 A
Fishing, hunting and trapping	4 A	0 A	0 A	5 A
Mining and oil and gas extraction	**1,044** A	**x**	**x**	**1,244** A
Oil and gas extraction	x	x	0 A	1,104 A
Mining	x	x	x	140 A
Utilities	**195** A	**x**	**x**	**230** A
Electric power	172 A	x	x	203 A
Other utilities	23 A	x	x	27 A
Construction	**88** A	**12** A	**0** A	**100** A
Manufacturing	**6,337** A	**395** A	**702** A	**7,434** A
Food	x	x	x	135 A
Beverage and tobacco	x	x	0 A	x
Textile	x	x	x	31 A
Wood products	x	x	0 A	73 A
Paper	129 A	x	x	133 A
Printing	40 A	0 A	0 A	40 A
Petroleum and coal products	x	F	0 A	F
Pharmaceutical and medicine	314 B	F	185 B	502 C
Other chemicals	177 A	x	F	208 A
Plastic products	x	6 A	x	140 A
Rubber products	x	x	0 A	x
Non-metallic mineral products	57 A	x	x	60 A
Primary metal (ferrous)	37 A	0 A	0 A	37 A
Primary metal (non-ferrous)	x	0 A	x	161 A
Fabricated metal products	182 A	x	x	185 A
Machinery	559 A	27 A	F	588 A
Computer and peripheral equipment	x	F	x	53 A
Communications equipment	1,352 A	x	x	1,483 D
Semiconductor and other electronic components	x	x	x	481 A
Navigational, measuring, medical and control instruments	348 A	x	x	430 A
Other computer and electronic products	32 A	1 C	0 A	33 A
Electrical equipment, appliance and components	x	x	0 A	131 A
Motor vehicle and parts	227 A	x	x	240 A
Aerospace products and parts	x	x	x	1,455 A
All other transportation equipment	x	8 A	x	150 A
Furniture and related products	29 A	0 A	0 A	29 A
Other manufacturing industries	178 A	x	F	208 A
Services	**5,475** A	**569** A	**1,005** A	**7,049** A
Wholesale trade	927 A	94 A	313 A	1,334 A
Retail trade	50 A	x	x	51 A
Transportation and warehousing	55 A	x	x	61 A
Information and cultural industries	981 A	20 A	120 A	1,122 A
Finance, insurance and real estate	266 A	x	x	273 A
Architectural, engineering and related services	439 A	48 A	11 B	499 A
Computer system design and related services	1,026 A	90 D	166 C	1,281 A
Management, scientific and technical consulting services	70 A	x	x	81 A
Scientific research and development services	1,225 A	284 A	373 A	1,881 A
Health care and social assistance	74 A	2 B	5 B	81 A
All other services	362 A	18 A	5 A	384 A

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

Table 5-17
Business enterprise research and development intramural expenditures — By sources of funds and by country of control of performer, 2012[p]

	Canadian performing companies	Federal government	Provincial government	Other Canadian sources	Foreign sources	Total sources of funds
	millions of dollars					
Total country of control	**13,229** [A]	**352** [A]	**292** [A]	**555** [A]	**1,725** [A]	**16,153** [A]
Canada	9,068 [A]	324 [A]	114 [B]	430 [A]	244 [B]	10,179 [A]
United States	2,367 [A]	F	161 [A]	78 [C]	900 [A]	3,524 [A]
Other foreign	1,794 [A]	9 [D]	17 [C]	48 [B]	582 [A]	2,450 [A]

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

Table 5-18
Business enterprise research and development intramural expenditures — By performing company revenue size

	2007	2008	2009	2010 [r]	2011 [r]	2012 [p]
	millions of dollars					
Total revenue size	**16,756**	**16,644**	**16,038** [A]	**15,803** [A]	**16,545** [A]	**16,153** [A]
Industrial Non-profit organizations	194	227	200	268 [A]	309 [A]	371 [A]
Less than $1,000,000	1,425	1,303	1,387 [B]	1,187 [B]	1,155 [B]	949 [D]
$1,000,000 to $9,999,999	2,639	2,758	2,917 [A]	2,628 [A]	2,574 [A]	2,374 [A]
$10,000,000 to $49,999,999	2,309	2,341	2,223 [A]	2,274 [A]	2,338 [A]	2,297 [C]
$50,000,000 to $99,999,999	1,101	878	948 [A]	836 [B]	908 [A]	912 [A]
$100,000,000 to $399,999,999	2,155	2,098	1,746 [A]	1,633 [D]	2,031 [A]	2,041 [A]
$400,000,000 or greater	6,933	7,039	6,617 [A]	6,978 [A]	7,232 [A]	7,208 [A]

Table 5-19
Business enterprise research and development intramural expenditures — By performing company employment size

	2008	2009	2010 [r]	2011 [r]	2012 [p]
	millions of dollars				
Total employment size	**16,644**	**16,038** [A]	**15,803** [A]	**16,545** [A]	**16,153** [A]
Industrial non-profit organizations	227	200 [A]	268 [A]	309 [A]	371 [A]
1 to 49 employees	3,405	3,701 [A]	3,450 [A]	3,296 [A]	2,976 [B]
50 to 99 employees	1,336	1,418 [B]	1,299 [B]	1,287 [A]	1,085 [B]
100 to 199 employees	1,247	1,278 [A]	1,128 [A]	1,219 [A]	1,156 [D]
200 to 499 employees	1,614	1,661 [A]	1,513 [B]	1,679 [A]	1,901 [A]
500 to 999 employees	1,628	1,557 [A]	1,680 [A]	1,334 [A]	1,263 [A]
1,000 to 1,999 employees	1,688	1,575 [A]	1,808 [D]	1,653 [A]	1,444 [A]
Greater than 1,999 employees	5,499	4,647 [A]	4,658 [A]	5,768 [A]	5,957 [A]

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

Table 5-20
Business enterprise research and development intramural expenditures — By field of science or technology

	2011	2012 [p]
	millions of dollars	
Total	**16,545** [A]	**16,153** [A]
Natural and formal sciences	**1,902** [A]	**1,543** [A]
Mathematics	63 [A]	37 [A]
Computer and information sciences	777 [A]	673 [A]
Physical sciences	89 [A]	84 [B]
Chemical sciences	292 [A]	269 [A]
Earth and related environmental sciences	497 [A]	280 [B]
Biological sciences	167 [A]	190 [A]
Other natural sciences	16 [A]	10 [A]
Engineering and technology	**12,643** [A]	**12,722** [A]
Civil engineering	148 [A]	121 [A]
Software engineering	2,751 [A]	2,639 [A]
Electrical engineering, electronic engineering and information technology	3,299 [A]	3,565 [A]
Mechanical engineering	2,803 [A]	2,259 [A]
Chemical engineering	427 [A]	457 [A]
Materials engineering	814 [A]	701 [A]
Medical engineering	77 [A]	64 [A]
Environmental engineering	784 [A]	745 [A]
Environmental biotechnology	15 [A]	15 [E]
Industrial biotechnology	30 [A]	49 [B]
Nano-technology	15 [B]	14 [A]
Other engineering and technologies	1,480 [A]	2,094 [A]
Medical and health sciences	**1,690** [A]	**1,589** [A]
Basic medicine	502 [A]	435 [A]
Clinical medicine	517 [A]	340 [A]
Health sciences	92 [A]	102 [A]
Medical biotechnology	332 [A]	306 [B]
Other medical sciences	247 [A]	405 [A]
Agricultural sciences	**311** [A]	**298** [A]
Agriculture, forestry, and fisheries	149 [A]	136 [A]
Animal and dairy science	51 [A]	53 [A]
Veterinary science	9 [A]	6 [B]
Agricultural biotechnology	59 [A]	51 [A]
Other agricultural sciences	43 [A]	53 [A]

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

Table 5-21

Business enterprise research and development intramural expenditures — By major fields of science or technology and industry, 2012[p]

	Natural and formal sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Total all industries
	millions of dollars				
Total all industries	**1,543** [A]	**12,722** [A]	**1,589** [A]	**298** [A]	**16,153** [A]
Agriculture, forestry, fishing and hunting	**x**	**14** [A]	**x**	**x**	**95** [A]
Agriculture	x	x	x	x	85 [A]
Forestry, logging and support activities for forestry	x	x	x	x	6 [A]
Fishing, hunting, trapping and animal aquaculture	x	x	x	x	5 [A]
Mining and oil and gas extraction	**x**	**1,041** [A]	**0** [A]	**x**	**1,244** [A]
Oil and gas extraction, contract drilling and related services	x	905 [A]	0 [A]	x	1,104 [A]
Mining and related support activities	x	136 [A]	0 [A]	x	140 [A]
Utilities	**28** [A]	**201** [A]	**x**	**x**	**230** [A]
Electric power generation, transmission and distribution	x	x	0 [A]	0 [A]	203 [A]
Other utilities	x	x	x	x	27 [A]
Construction	**5** [A]	**95** [A]	**0** [A]	**0** [A]	**100** [A]
Manufacturing	**391** [A]	**6,504** [A]	**443** [A]	**97** [A]	**7,434** [A]
Food manufacturing	x	x	x	45 [A]	135 [A]
Beverage and tobacco product manufacturing	x	x	0 [A]	x	x
Textiles	x	x	x	x	31 [A]
Wood product manufacturing	x	59 [A]	x	x	73 [A]
Paper manufacturing	x	125 [A]	x	1 [A]	133 [A]
Printing and related support activities	x	x	0 [A]	0 [A]	40 [A]
Petroleum and coal products manufacturing	x	x	0 [A]	x	x
Pharmaceutical and medicine manufacturing	133 [A]	9 [D]	360 [A]	F	502 [C]
Other chemicals	58 [A]	x	x	x	208 [A]
Plastic product manufacturing	x	129 [A]	x	x	140 [A]
Rubber product manufacturing	x	x	0 [A]	x	x
Non-metallic mineral product manufacturing	x	x	0 [A]	0 [A]	60 [A]
Primary metal (ferrous)	x	x	0 [A]	0 [A]	37 [A]
Primary metal (non-ferrous)	x	x	0 [A]	0 [A]	161 [A]
Fabricated metal product manufacturing	7 [A]	178 [A]	x	x	185 [A]
Machinery manufacturing	x	566 [A]	x	x	588 [A]
Computer and peripheral equipment manufacturing	x	x	x	x	53 [A]
Communications equipment manufacturing	12 [A]	1,471 [A]	0 [A]	0 [A]	1,483 [D]
Semiconductor and other electronic component manufacturing	16 [A]	464 [A]	x	x	481 [A]
Navigational, measuring, medical and control instrument manufacturing	F	360 [B]	x	x	430 [A]
Other computer and electronic products	2 [A]	31 [A]	0 [A]	0 [A]	33 [A]
Electrical equipment, appliance and component manufacturing	6 [A]	125 [A]	x	x	131 [A]
Motor vehicle and parts	2 [A]	238 [A]	0 [A]	0 [A]	240 [A]
Aerospace products and parts manufacturing	x	1,454 [A]	x	0 [A]	1,455 [A]
All other transportation equipment	0 [A]	x	0 [A]	x	150 [A]
Furniture and related product manufacturing	x	x	x	x	29 [A]
Other manufacturing industries	14 [A]	157 [A]	36 [A]	1 [A]	208 [A]
Services	**912** [A]	**4,868** [A]	**1,145** [A]	**124** [A]	**7,049** [A]
Wholesale trade	73 [A]	694 [A]	493 [A]	74 [A]	1,334 [A]
Retail trade	x	41 [A]	x	2 [A]	51 [A]
Transportation and warehousing	8 [A]	53 [A]	x	x	61 [A]
Information and cultural industries	141 [A]	979 [A]	x	x	1,122 [A]
Finance, insurance and real estate	74 [A]	196 [A]	3 [B]	1 [C]	273 [A]
Architectural, engineering and related services	68 [A]	423 [A]	5 [D]	2 [A]	499 [A]
Computer systems design and related services	x	939 [A]	x	x	1,281 [A]
Management, scientific and technical consulting services	25 [A]	49 [A]	5 [A]	2 [A]	81 [A]
Scientific research and development services	141 [A]	1,187 [A]	522 [A]	32 [A]	1,881 [A]
Health care and social assistance	6 [A]	8 [A]	66 [A]	0 [B]	81 [A]
All other services	51 [A]	299 [A]	26 [A]	9 [A]	384 [A]

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

Table 6-1
Business enterprise research and development current intramural expenditures — By industry

	2010 r	2011 r	2012 p	2013 p	2014 p
	millions of dollars				
Total all industries	**14,871** A	**15,483** A	**14,694** A	**14,329** A	**14,300** A
Agriculture, forestry, fishing and hunting	**123** A	**103** A	**87** A	**84** B	**86** B
Agriculture	104 A	81 A	76 A	73 B	75 B
Forestry, logging and support activities for forestry	12 A	15 A	6 A	x	x
Fishing, hunting, trapping and animal aquaculture	8 A	7 A	5 A	x	x
Mining and oil and gas extraction	**868** A	**832** A	**838** A	**647** B	**595** B
Oil and gas extraction, contract drilling and related services	781 A	698 A	701 A	509 B	484 B
Mining and related support activities	87 A	134 A	137 A	138 B	112 D
Total utilities	**172** A	**x**	**195** A	**203** A	**190** A
Electric power generation, transmission and distribution	x	x	x	x	x
Other utilities	x	27 A	x	x	x
Construction	**108** B	**x**	**84** A	**94** C	**97** C
Manufacturing	**6,882** A	**7,175** A	**6,802** A	**6,709** A	**6,751** A
Food manufacturing	171 A	147 A	127 A	125 B	133 A
Beverage and tobacco product manufacturing	16 A	x	x	x	9 B
Textiles	41 A	x	30 A	30 B	32 B
Wood product manufacturing	86 A	86 A	72 A	x	59 B
Paper manufacturing	145 A	141 A	131 A	x	138 C
Printing and related support activities	51 A	43 A	40 A	39 B	39 B
Petroleum and coal products manufacturing	x	x	x	x	x
Pharmaceutical and medicine manufacturing	628 A	486 A	477 A	496 A	516 B
Other chemicals	342 A	284 A	194 A	174 C	174 D
Plastic product manufacturing	121 A	136 A	x	118 B	124 B
Rubber product manufacturing	20 A	18 A	x	x	x
Non-metallic mineral product manufacturing	62 A	73 A	59 A	62 D	64 B
Primary metal (ferrous)	39 A	42 A	36 A	x	x
Primary metal (non-ferrous)	x	166 A	x	x	x
Fabricated metal product manufacturing	222 A	196 A	168 A	175 C	169 B
Machinery manufacturing	541 A	608 A	566 A	621 A	634 A
Computer and peripheral equipment manufacturing	52 A	48 A	49 A	54 A	51 A
Communications equipment manufacturing	x	1,327 A	1,396 A	1,338 A	1,288 A
Semiconductor and other electronic component manufacturing	512 A	502 A	464 A	455 A	459 A
Navigational, measuring, medical and control instrument manufacturing	425 A	356 A	384 A	369 A	371 A
Other computer and electronic products	26 A	25 A	x	x	x
Electrical equipment, appliance and component manufacturing	154 A	136 A	122 A	x	123 B
Motor vehicle and parts	288 A	244 A	212 A	211 A	235 B
Aerospace products and parts manufacturing	x	x	x	x	x
All other transportation equipment	162 A	181 A	147 A	154 A	154 A
Furniture and related product manufacturing	42 A	34 A	28 A	27 B	28 B
Other manufacturing industries	196 A	186 A	195 A	201 B	211 B
Services	**6,719** A	**7,085** A	**6,688** A	**6,592** A	**6,581** A
Wholesale trade	1,240 A	1,320 A	1,268 A	1,154 A	1,133 A
Retail trade	59 A	66 A	50 A	59 C	61 C
Transportation and warehousing	61 A	51 A	61 A	60 B	62 A
Information and cultural industries	1,163 A	1,049 A	1,059 A	1,074 A	1,097 A
Finance, insurance and real estate	245 A	226 A	250 A	231 B	228 A
Architectural, engineering and related services	379 A	453 A	473 A	465 B	456 A
Computer systems design and related services	1,305 A	1,438 A	1,245 A	1,239 A	1,218 A
Management, scientific and technical consulting services	78 A	83 A	78 A	87 C	88 D
Scientific research and development services	1,743 A	1,927 A	1,768 A	1,795 B	1,796 A
Health care and social assistance	95 A	87 A	75 A	80 B	91 E
All other services	353 A	384 A	362 A	349 B	350 B

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

Table 6-2

Business enterprise research and development current intramural expenditures — By industry and by type of expenditures, 2012[p]

	Wages and salaries	Other current expenditures	Total business enterprise research and development current expenditures
	millions of dollars		
Total all industries	**9,317** A	**5,377** A	**14,694** A
Agriculture, forestry, fishing and hunting	**53** A	**34** A	**87** A
Agriculture	44 A	32 A	76 A
Forestry, logging and support activities for forestry	5 A	1 A	6 A
Fishing, hunting, trapping and animal aquaculture	3 A	1 A	5 A
Mining and oil and gas extraction	**166** C	**672** A	**838** A
Oil and gas extraction, contract drilling and related services	126 D	575 A	701 A
Mining and related support activities	40 A	97 A	137 A
Total utilities	**118** A	**77** A	**195** A
Electric power generation, transmission and distribution	101 A	x	x
Other utilities	17 A	x	x
Construction	**63** A	**21** B	**84** A
Manufacturing	**4,025** A	**2,777** A	**6,802** A
Food manufacturing	90 A	38 A	127 A
Beverage and tobacco product manufacturing	x	5 A	x
Textiles	23 A	7 A	30 A
Wood product manufacturing	30 A	42 A	72 A
Paper manufacturing	40 A	91 A	131 A
Printing and related support activities	34 A	5 A	40 A
Petroleum and coal products manufacturing	20 A	x	x
Pharmaceutical and medicine manufacturing	223 A	254 A	477 A
Other chemicals	115 A	79 A	194 A
Plastic product manufacturing	90 A	x	x
Rubber product manufacturing	x	x	x
Non-metallic mineral product manufacturing	29 A	30 A	59 A
Primary metal (ferrous)	x	x	36 A
Primary metal (non-ferrous)	x	66 A	x
Fabricated metal product manufacturing	140 A	28 A	168 A
Machinery manufacturing	423 A	143 A	566 A
Computer and peripheral equipment manufacturing	39 A	10 A	49 A
Communications equipment manufacturing	843 A	553 A	1,396 A
Semiconductor and other electronic component manufacturing	366 A	98 A	464 A
Navigational, measuring, medical and control instrument manufacturing	276 A	108 A	384 A
Other computer and electronic products	25 A	x	x
Electrical equipment, appliance and component manufacturing	94 A	28 A	122 A
Motor vehicle and parts	144 A	68 A	212 A
Aerospace products and parts manufacturing	x	774 A	x
All other transportation equipment	97 A	51 A	147 A
Furniture and related product manufacturing	24 A	4 A	28 A
Other manufacturing industries	150 A	45 B	195 A
Services	**4,892** A	**1,796** A	**6,688** A
Wholesale trade	765 A	503 A	1,268 A
Retail trade	44 A	5 A	50 A
Transportation and warehousing	30 A	31 A	61 A
Information and cultural industries	919 A	140 A	1,059 A
Finance, insurance and real estate	174 A	76 A	250 A
Architectural, engineering and related services	388 A	86 A	473 A
Computer systems design and related services	1,108 A	137 B	1,245 A
Management, scientific and technical consulting services	66 A	12 A	78 A
Scientific research and development services	1,050 A	718 A	1,768 A
Health care and social assistance	59 A	16 A	75 A
All other services	290 A	73 A	362 A

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

Table 6-3
Business enterprise research and development current intramural expenditures — By province

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Total	**15,569** A	**15,043** A	**14,871** A	**15,483** A	**14,694** A
Atlantic Canada	300 B	313 A	256 A	248 A	249 A
Newfoundland and Labrador	x	80 B	64 A	70 A	88 C
Prince Edward Island	x	11 D	12 B	11 B	20 A
Nova Scotia	x	100 B	86 A	79 B	75 B
New Brunswick	116 A	122 B	94 A	87 B	67 A
Quebec	4,597 A	4,530 B	4,530 A	4,625 B	4,384 A
Ontario	7,433 A	6,903 A	6,796 A	7,139 B	6,894 A
Manitoba	171 A	184 C	214 B	183 B	205 A
Saskatchewan	136 D	142 B	149 B	183 A	177 B
Alberta	1,372 A	1,407 A	1,388 A	1,553 A	1,306 A
British Columbia and Territories [1]	1,560 A	1,564 A	1,538 A	1,550 A	1,479 A

1. Includes Yukon, Northwest Territories and Nunavut.
Note(s): Components may not add to totals due to rounding.

Table 6-4
Business enterprise research and development current intramural expenditures — As a percentage of performing company revenues, by company revenue size

	2008	2009	2010 r	2011 r	2012 p
	percent				
Total all revenue sizes	**1.7**	**1.6**	**1.6**	**1.7**	**1.7**
Less than $1,000,000	33.8	34.3	x	x	x
$1,000,000 to $9,999,999	6.6	6.7	6.3	6.7	7.0
$10,000,000 to $49,999,999	3.3	3.1	3.3	3.5	3.9
$50,000,000 to $99,999,999	2.2	2.3	2.1	2.3	3.0
$100,000,000 to $399,999,999	2.0	1.8	1.6	2.1	2.5
$400,000,000 or greater	1.0	0.9	1.0	1.0	0.9

Note(s): Revenue size is calculated for the year in which R&D expenditures occurred.

Table 6-5
Business enterprise research and development current intramural expenditures — As a percentage performing company revenues, by country of control

	2008	2009	2010 r	2011 r	2012 p
	percent				
Total country of control	**1.7**	**1.6**	**1.6**	**1.7**	**1.7**
Canada	2.0	1.8	1.7	1.7	1.9
Foreign	**1.4**	**1.4**	**1.5**	**1.5**	**1.4**
United States	1.6	1.5	1.5	1.5	1.7
Other foreign	1.0	1.2	1.6	1.6	1.2

Table 6-6

Business enterprise research and development current intramural expenditures — As a percentage of performing company revenues, by industry and by country of control, 2012[p]

	Canada	Foreign	Total country of control
	percent		
Total all industries	**1.9**	**1.4**	**1.7**
Agriculture, forestry, fishing and hunting	**x**	**x**	**1.5**
Agriculture	x	x	x
Forestry, logging and support activities for forestry	x	..	x
Fishing, hunting, trapping and animal aquaculture	5.6	..	5.6
Mining and oil and gas extraction	**1.0**	**0.7**	**0.8**
Oil and gas extraction, contract drilling and related services	1.3	0.7	0.9
Mining and related support activities	0.5	0.7	0.6
Utilities	**0.9**	**0.1**	**0.8**
Electric power generation, transmission and distribution	x	x	x
Other utilities	x	x	x
Construction	**x**	**x**	**1.0**
Manufacturing	**2.5**	**1.0**	**1.6**
Food manufacturing	0.4	0.2	0.3
Beverage and tobacco product manufacturing	2.0	x	x
Textiles	x	x	1.7
Wood product manufacturing	x	x	0.9
Paper manufacturing	1.1	0.5	0.8
Printing and related support activities	1.3	0.7	1.2
Petroleum and coal products manufacturing	x	x	x
Pharmaceutical and medicine manufacturing	5.2	4.9	5.0
Other chemicals	1.8	0.4	0.7
Plastic product manufacturing	1.7	x	x
Rubber product manufacturing	1.5	x	x
Non-metallic mineral product manufacturing	1.4	0.6	0.8
Primary metal (ferrous)	0.8	0.1	0.1
Primary metal (non-ferrous)	x	1.1	x
Fabricated metal product manufacturing	1.5	0.9	1.4
Machinery manufacturing	3.8	2.2	3.4
Computer and peripheral equipment manufacturing	8.6	4.0	6.4
Communications equipment manufacturing	10.6	9.9	10.6
Semiconductor and other electronic component manufacturing	x	x	5.7
Navigational, measuring, medical and control instrument manufacturing	8.7	6.3	7.0
Other computer and electronic products	x	x	x
Electrical equipment, appliance and component manufacturing	3.2	0.8	1.5
Motor vehicle and parts	1.4	0.1	0.3
Aerospace products and parts manufacturing	x	x	x
All other transportation equipment	3.9	1.2	2.1
Furniture and related product manufacturing	x	x	1.0
Other manufacturing industries	2.4	3.1	2.6
Services	**1.7**	**3.8**	**2.1**
Wholesale trade	0.7	3.5	1.9
Retail trade	x	x	0.3
Transportation and warehousing	0.2	0.1	0.2
Information and cultural industries	2.5	10.5	3.0
Finance, insurance and real estate	0.2	0.5	0.2
Architectural, engineering and related services	3.5	1.2	2.6
Computer systems design and related services	10.1	13.0	10.7
Management, scientific and technical consulting services	x	x	6.5
Scientific research and development services	43.7	23.4	30.4
Health care and social assistance	x	x	7.2
All other services	1.4	0.5	1.1

Table 7
Business enterprise research and development capital intramural expenditures by industry

	2010 r	2011 r	2012 p	2013 p	2014 p
	millions of dollars				
Total all industries	**932** A	**1,063** A	**1,459** A	**1,206** B	**1,101** C
Agriculture, forestry, fishing and hunting	**8** A	**20** A	**8** A	**8** C	**9** D
Agriculture	7 A	19 A	8 A	8 C	9 D
Forestry, logging and support activities for forestry	0 B	1 A	0 A	x	x
Fishing, hunting, trapping and animal aquaculture	0 A	0 A	0 A	x	x
Mining and oil and gas extraction	**113** A	**212** A	**407** A	**347** B	**346** E
Oil and gas extraction, contract drilling and related services	108 A	211 A	403 A	343 B	344 D
Mining and related support activities	5 A	1 A	3 A	F	F
Total utilities	**17** A	**x**	**35** A	**33** A	**25** B
Electric power generation, transmission and distribution	x	x	x	x	x
Other utilities	x	1 D	x	x	x
Construction	**5** D	**x**	**16** A	**8** C	**8** D
Manufacturing	**452** A	**403** B	**632** A	**450** D	**380** A
Food manufacturing	8 A	4 A	8 B	6 D	F
Beverage and tobacco product manufacturing	0 A	0 A	1 A	F	F
Textiles	1 A	x	0 A	F	F
Wood product manufacturing	1 D	1 A	1 A	x	0 D
Paper manufacturing	7 A	2 A	2 A	x	F
Printing and related support activities	2 A	1 A	1 A	F	1 E
Petroleum and coal products manufacturing	x	x	x	x	x
Pharmaceutical and medicine manufacturing	41 A	21 D	25 B	13 D	20 D
Other chemicals	11 B	19 A	15 C	6 D	F
Plastic product manufacturing	12 A	F	x	F	20 D
Rubber product manufacturing	1 A	F	5 A	2 E	F
Non-metallic mineral product manufacturing	14 A	3 A	1 A	1 E	F
Primary metal (ferrous)	2 C	1 A	1 A	x	x
Primary metal (non-ferrous)	x	1 A	x	x	x
Fabricated metal product manufacturing	12 A	15 A	16 A	12 B	12 D
Machinery manufacturing	13 A	29 B	23 B	30 C	34 B
Computer and peripheral equipment manufacturing	3 A	4 A	3 A	2 D	4 B
Communications equipment manufacturing	x	148 A	87 A	50 A	55 A
Semiconductor and other electronic component manufacturing	17 C	19 A	17 C	18 B	13 D
Navigational, measuring, medical and control instrument manufacturing	12 B	16 A	47 A	45 A	41 A
Other computer and electronic products	0 A	0 A	x	x	x
Electrical equipment, appliance and component manufacturing	6 B	9 A	9 A	x	10 C
Motor vehicle and parts	25 A	7 A	28 A	7 D	9 C
Aerospace products and parts manufacturing	x	x	x	x	x
All other transportation equipment	4 A	5 A	3 A	5 A	5 B
Furniture and related product manufacturing	1 A	1 A	1 A	1 C	1 D
Other manufacturing industries	13 A	17 B	13 C	17 D	18 C
Services	**337** A	**386** B	**360** A	**359** B	**333** B
Wholesale trade	51 A	50 A	66 A	56 A	65 D
Retail trade	2 A	3 A	1 A	F	2 D
Transportation and warehousing	7 A	3 A	1 A	1 D	1 D
Information and cultural industries	73 A	69 A	63 A	65 A	71 B
Finance, insurance and real estate	23 A	17 A	24 A	22 C	21 C
Architectural, engineering and related services	10 B	16 A	26 B	57 D	F
Computer systems design and related services	39 A	80 E	36 B	37 D	38 C
Management, scientific and technical consulting services	7 A	6 B	3 A	F	F
Scientific research and development services	94 A	87 A	113 A	80 B	63 B
Health care and social assistance	3 B	7 A	6 A	6 B	6 C
All other services	27 A	48 C	22 A	F	30 D

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

Table 8-1
Business enterprise research and development personnel — By industry group and by region, 2012[p]

	Atlantic Canada	Quebec	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia and Territories [1]	Total
	number							
Total all industries	**2,720** A	**42,951** A	**61,200** A	**1,787** A	**1,559** C	**7,774** A	**14,167** A	**132,156** A
Agriculture, forestry, fishing and hunting	182 A	521 A	292 A	47 A	54 A	48 B	295 A	1,439 A
Mining and oil and gas extraction	103 D	127 C	221 B	x	x	1,082 A	183 C	1,763 E
Utilities	27 C	519 A	479 A	x	x	37 B	63 A	1,148 D
Construction	15 D	396 A	540 A	30 B	31 C	191 A	114 B	1,318 A
Manufacturing	857 B	20,330 A	28,466 A	693 A	667 A	1,497 B	3,934 A	56,445 A
Services	1,536 A	21,058 A	31,201 A	997 B	756 D	4,918 A	9,578 A	70,044 B

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 8-2
Business enterprise research and development personnel — By province and by occupational category, 2012[p]

	Research and development professionals	Research and development technical and administrative support staff [1]	Total research and development personnel
	number		
Total	**88,959** A	**43,197**	**132,156** A
Atlantic Canada	1,765 A	954 B	2,720 A
Newfoundland and Labrador	448 A	169 D	617 B
Prince Edward Island	152 B	104 A	256 A
Nova Scotia	714 B	266 B	980 B
New Brunswick	452 A	415 B	867 B
Quebec	25,949 A	17,002 A	42,951 A
Ontario	43,939 A	17,261 A	61,200 A
Manitoba	987 A	800 A	1,787 A
Saskatchewan	801 B	758 B	1,559 C
Alberta	5,398 A	2,376 B	7,774 A
British Columbia and Territories [2]	10,121 A	4,046 A	14,167 A

1. Includes technicians and other.
2. 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 8-3
Business enterprise research and development personnel — By industry and by occupationnal category, 2012[p]

	Research and development professionals	Research and development technicians and technologists	Research and development other support staff	Total research and development personnel
	number			
Total all industries	**88,959** A	**32,954** A	**10,243** A	**132,156** A
Agriculture, forestry, fishing and hunting	**685** A	**600** A	**155** A	**1,439** A
Agriculture	568 A	543 A	137 A	1,248 A
Forestry, logging and support activities for forestry	69 A	x	x	101 A
Fishing, hunting, trapping and animal aquaculture	47 A	x	x	90 A
Mining and oil and gas extraction	**1,190** A	**399** A	**173** B	**1,763** E
Oil and gas extraction, contract drilling and related services	908 A	247 B	91 C	F
Mining and related support activities	282 A	152 A	82 A	516 A
Total utilities	**833** D	**F**	**F**	**1,148** D
Electric power generation, transmission and distribution	687 D	x	x	874 D
Other utilities	146 A	x	x	274 A
Construction	**801** A	**449** A	**68** A	**1,318** A
Manufacturing	**35,211** A	**15,154** A	**6,081** A	**56,445** A
Food manufacturing	917 A	666 A	264 A	1,847 A
Beverage and tobacco product manufacturing	73 A	x	x	140 A
Textiles	178 A	187 A	69 A	434 A
Wood product manufacturing	257 A	252 A	76 A	586 A
Paper manufacturing	306 A	349 A	67 A	721 A
Printing and related support activities	323 A	368 A	47 B	738 A
Petroleum and coal products manufacturing	128 A	x	x	186 A
Pharmaceutical and medicine manufacturing	1,822 A	719 A	790 A	3,332 A
Other chemicals	1,292 A	734 A	179 A	2,205 A
Plastic product manufacturing	892 A	598 A	211 A	1,701 A
Rubber product manufacturing	173 A	x	x	228 A
Non-metallic mineral product manufacturing	291 A	196 A	31 A	517 A
Primary metal (ferrous)	218 A	x	x	278 A
Primary metal (non-ferrous)	278 A	139 A	63 A	480 A
Fabricated metal product manufacturing	1,503 A	1,205 A	236 A	2,945 A
Machinery manufacturing	3,864 A	2,547 A	430 A	6,841 A
Computer and peripheral equipment manufacturing	450 A	128 A	18 A	596 C
Communications equipment manufacturing	7,757 A	676 A	251 A	8,684 A
Semiconductor and other electronic component manufacturing	3,008 A	804 A	208 A	4,021 A
Navigational, measuring, medical and control instrument manufacturing	3,083 A	835 A	207 A	4,125 A
Other computer and electronic products	325 A	89 A	16 A	430 A
Electrical equipment, appliance and component manufacturing	919 A	572 A	116 B	1,607 A
Motor vehicle and parts	1,147 A	682 A	147 A	1,975 A
Aerospace products and parts manufacturing	3,547 A	x	x	7,294 A
All other transportation equipment	833 A	364 A	113 A	1,310 A
Furniture and related product manufacturing	247 A	272 A	51 A	570 A
Other manufacturing industries	1,382 A	1,033 A	239 A	2,654 A
Services	**50,240** A	**16,141** A	**3,662** A	**70,044** B
Wholesale trade	7,151 A	2,003 A	732 A	9,886 A
Retail trade	600 A	313 A	70 A	983 A
Transportation and warehousing	292 A	151 A	63 A	506 A
Information and cultural industries	8,315 A	3,458 A	573 A	12,345 A
Finance, insurance and real estate	1,448 A	509 A	76 A	2,033 A
Architectural, engineering and related services	3,852 A	1,254 A	348 A	5,454 A
Computer systems design and related services	12,681 A	3,419 A	592 A	16,692 A
Management, scientific and technical consulting services	989 A	267 A	49 A	1,305 A
Scientific research and development services	10,797 A	2,705 A	771 A	14,273 A
Health care and social assistance	783 A	362 A	72 A	1,218 A
All other services	3,332 B	1,700 C	317 D	F

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

Table 8-4
Business enterprise research and development personnel — By occupational category

	2008	2009	2010 r	2011 r	2012 p
	number				
Total research and development personnel	**172,744** D	**155,172** A	**144,270** A	**145,601** A	**132,156** A
Research and development professionals	98,387 A	93,357 A	94,528 A	97,028 A	88,959 A
Research and development technicians and technologists	52,075 A	47,187 A	38,567 A	39,290 A	32,954 A
Research and development other support staff	22,282 A	14,628 A	11,175 A	9,283 A	10,243 A

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

Table 8-5
Business enterprise research and development personnel — By field of science or technology

	2011	2012 p
	number	
Total	**145,601** A	**132,156** A
Natural and formal sciences	**20,257** A	**15,937** A
Mathematics	**534** A	**486** A
Computer and information sciences	11,606 A	9,046 A
Physical sciences	1,222 B	1,086 A
Chemical sciences	2,712 A	2,575 A
Earth and related environmental sciences	2,459 A	1,145 A
Biological sciences	1,598 A	1,514 A
Other natural sciences	125 A	85 A
Engineering and technology	**110,609** A	**102,574** A
Civil engineering	1,807 A	1,331 A
Software engineering	27,785 A	26,903 A
Electrical engineering, electronic engineering and information technology	29,126 A	28,414 A
Mechanical engineering	24,809 A	21,100 A
Chemical engineering	2,896 B	2,698 A
Materials engineering	7,819 A	6,759 A
Medical engineering	957 A	761 A
Environmental engineering	3,023 A	2,362 A
Environmental biotechnology	195 B	176 B
Industrial biotechnology	434 B	515 A
Nano-technology	145 B	143 A
Other engineering and technologies	11,614 A	11,412 A
Medical and health sciences	**11,497** A	**10,641** A
Basic medicine	3,405 A	3,422 A
Clinical medicine	2,370 A	1,811 A
Health sciences	924 A	905 A
Medical biotechnology	2,411 A	2,199 A
Other medical sciences	2,387 A	2,305 A
Agricultural sciences	**3,237** A	**3,005** A
Agriculture, forestry, and fisheries	1,848 A	1,590 A
Animal and dairy science	492 A	515 A
Veterinary science	78 A	88 A
Agricultural biotechnology	487 A	470 A
Other agricultural sciences	333 A	341 A

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

Table 8-6
Business enterprise research and development personnel — By major fields of science or technology and industry, 2012[p]

	Natural and formal sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Total
	number				
Total all industries	**15,937** A	**102,574** A	**10,641** A	**3,005** A	**132,156** A
Agriculture, forestry, fishing and hunting	**x**	**217** A	**x**	**1,048** A	**1,439** A
Agriculture	x	178 A	x	935 A	1,248 A
Forestry, logging and support activities for forestry	x	x	x	x	101 A
Fishing, hunting, trapping and animal aquaculture	x	x	x	x	90 A
Mining and oil and gas extraction	**164** C	**1,582** A	**0** A	**17** D	**1,763** E
Oil and gas extraction, contract drilling and related services	x	1,102 A	0 A	x	F
Mining and related support activities	x	480 A	0 A	x	516 A
Utilities	**123** A	**1,012** A	**x**	**x**	**1,148** D
Electric power generation, transmission and distribution	102 A	772 A	0 A	0 A	874 D
Other utilities	21 A	240 A	x	x	274 A
Construction	**x**	**1,216** A	**0** A	**x**	**1,318** A
Manufacturing	**3,609** A	**48,708** A	**3,281** A	**847** A	**56,445** A
Food manufacturing	73 A	1,221 A	21 A	532 A	1,847 A
Beverage and tobacco product manufacturing	25 A	98 A	0 A	17 A	140 A
Textiles	x	415 A	x	x	434 A
Wood product manufacturing	x	517 A	x	51 A	586 A
Paper manufacturing	x	674 A	x	5 A	721 A
Printing and related support activities	103 A	635 A	0 A	0 A	738 A
Petroleum and coal products manufacturing	x	x	0 A	x	186 A
Pharmaceutical and medicine manufacturing	670 A	127 C	2,528 A	F	3,332 A
Other chemicals	741 A	1,276 A	64 A	124 A	2,205 A
Plastic product manufacturing	x	1,569 A	x	x	1,701 A
Rubber product manufacturing	x	x	0 A	x	228 A
Non-metallic mineral product manufacturing	48 A	470 A	0 A	0 A	517 A
Primary metal (ferrous)	4 A	274 A	0 A	0 A	278 A
Primary metal (non-ferrous)	x	x	0 A	0 A	480 A
Fabricated metal product manufacturing	70 A	2,866 A	x	x	2,945 A
Machinery manufacturing	172 A	6,538 A	x	x	6,841 A
Computer and peripheral equipment manufacturing	x	518 A	x	x	596 C
Communications equipment manufacturing	97 A	8,587 A	0 A	0 A	8,684 A
Semiconductor and other electronic component manufacturing	209 A	3,807 A	x	x	4,021 A
Navigational, measuring, medical and control instrument manufacturing	725 A	3,231 A	x	x	4,125 A
Other computer and electronic products	28 A	402 A	0 A	0 A	430 A
Electrical equipment, appliance and component manufacturing	131 A	1,470 A	x	x	1,607 A
Motor vehicle and parts	16 B	1,959 A	0 A	0 A	1,975 A
Aerospace products and parts manufacturing	x	7,280 A	x	0 A	7,294 A
All other transportation equipment	0 A	x	0 A	x	1,310 A
Furniture and related product manufacturing	x	559 A	x	x	570 A
Other manufacturing industries	147 A	2,095 A	404 A	8 A	2,654 A
Services	**11,792** A	**49,838** A	**7,338** A	**1,076** A	**70,044** B
Wholesale trade	797 A	6,762 A	1,812 A	515 A	9,886 A
Retail trade	128 A	778 A	45 A	33 A	983 A
Transportation and warehousing	92 A	408 A	x	x	506 A
Information and cultural industries	2,210 A	10,088 A	x	x	12,345 A
Finance, insurance and real estate	398 A	1,557 A	54 A	24 C	2,033 A
Architectural, engineering and related services	1,000 A	4,378 A	30 D	45 C	5,454 A
Computer systems design and related services	4,529 A	11,960 A	194 A	8 C	16,692 A
Management, scientific and technical consulting services	396 A	799 A	77 A	34 A	1,305 A
Scientific research and development services	1,461 A	8,678 A	3,869 A	265 A	14,273 A
Health care and social assistance	117 A	120 A	977 A	5 B	1,218 A
All other services	665 A	4,311 A	254 A	120 A	F

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

Table 9
Business enterprise research and development professional personnel, by level of education

	Bachelors	Masters	Doctorates	College	Without college or university diploma	Total level of education
	number					
2012 p	52,285 A	16,347 A	9,271 B	7,207 B	3,849 B	**88,959** A
2011 r	57,589 A	17,963 A	9,077 A	7,559 A	4,841 A	**97,028** A
2010 r	56,522 A	17,014 A	8,126 A	7,881 B	4,985 A	**94,528** A
2009	57,503 A	13,989 A	6,924 A	10,174 A	4,767 A	**93,357** A
2008	69,774 C	18,319 D	10,294 D	…	…	**98,387** A

Note(s): Data are estimated for all performing companies not surveyed directly, i.e. all data points taken from performers for whom data were obtained through the tax data (see Survey Methodology). Components may not add to totals due to rounding. Personnel counts are reported as full-time equivalent.

Table 10-1
Business enterprise research and development extramural payments by industry — And by year

	2008	2009	2010 r	2011 r	2012 p
	millions of dollars				
Total all industries	**3,817**	**3,681** A	**2,928** A	**2,897** A	**2,978** A
Agriculture, forestry, fishing and hunting	**16**	**21** A	**18** A	**x**	**11** A
Agriculture	9	13 A	13 A	x	9 A
Forestry, logging and support activities for forestry	6	4 A	x	4 A	2 A
Fishing, hunting, trapping and animal aquaculture	2	3 A	x	1 A	1 A
Mining and oil and gas extraction	**86**	**98** A	**155** B	**x**	**205** D
Oil and gas extraction, contract drilling and related services	66	65 A	127 B	93 D	169 E
Mining and related support activities	19	33 A	28 D	x	36 A
Utilities	**104**	**106** A	**99** D	**111** A	**127** A
Electric power generation, transmission and distribution	97	100 A	91 D	105 A	x
Other utilities	6	7 A	8 A	6 A	x
Construction	**14**	**25** D	**20** A	**x**	**14** A
Manufacturing	**1,256**	**1,193** A	**822** A	**916** A	**719** A
Food manufacturing	115	26 A	26 A	17 D	15 A
Beverage and tobacco product manufacturing	3	4 A	3 A	1 A	4 A
Textiles	2	3 A	2 A	2 A	2 A
Wood product manufacturing	21	21 A	12 A	12 A	x
Paper manufacturing	16	15 A	13 A	13 A	17 A
Printing and related support activities	x	3 A	2 A	6 A	6 E
Petroleum and coal products manufacturing	x	12 A	10 A	93 D	12 A
Pharmaceutical and medicine manufacturing	394	457 A	170 A	105 A	140 A
Other chemicals	61	107 B	88 A	x	72 A
Plastic product manufacturing	13	19 C	16 A	14 A	14 A
Rubber product manufacturing	5	3 A	3 A	1 A	3 A
Non-metallic mineral product manufacturing	5	7 E	10 A	6 A	4 A
Primary metal (ferrous)	4	5 B	x	3 A	x
Primary metal (non-ferrous)	35	17 A	21 A	x	x
Fabricated metal product manufacturing	22	26 A	24 A	17 A	x
Machinery manufacturing	55	59 A	x	x	50 A
Computer and peripheral equipment manufacturing	8	4 A	4 A	x	6 A
Communications equipment manufacturing	162	144 A	86 A	103 D	43 A
Semiconductor and other electronic component manufacturing	17	14 A	15 A	16 A	x
Navigational, measuring, medical and control instrument manufacturing	48	32 A	43 A	82 A	29 A
Other computer and electronic products	x	2 E	2 A	2 A	2 A
Electrical equipment, appliance and component manufacturing	16	21 A	16 A	10 A	8 E
Motor vehicle and parts	100	79 C	69 C	83 A	x
Aerospace products and parts manufacturing	59	70 B	97 A	162 A	x
All other transportation equipment	11	13 D	11 A	7 A	10 A
Furniture and related product manufacturing	4	5 A	5 A	3 A	2 A
Other manufacturing industries	21	25 A	23 A	28 A	37 A
Services	**2,342**	**2,238** A	**1,814** A	**1,689** A	**1,902** A
Wholesale trade	579	611 A	408 A	306 A	414 A
Retail trade	18	15 A	x	14 A	11 A
Transportation and warehousing	54	49 A	x	25 A	24 C
Information and cultural industries	585	553 B	536 A	454 A	379 A
Finance, insurance and real estate	111	123 A	94 A	87 D	302 B
Architectural, engineering and related services	58	84 A	x	61 A	54 A
Computer systems design and related services	141	154 C	152 A	266 A	224 A
Management, scientific and technical consulting services	14	21 A	x	24 A	24 A
Scientific research and development services	666	511 A	347 A	328 A	357 A
Health care and social assistance	44	36 A	29 A	34 A	35 A
All other services	71	81 A	x	91 A	79 A

Note(s): Extramural payments are expenditures made for R&D performed by other organizations in Canada and/or in other countries. Other organizations include parent, affiliated and subsidiary companies, other non-related companies, private non-profit organizations, universities, hospitals, industrial research institutes or associations, provincial research organizations, and other organizations including governments and individuals. Extramural R&D payments include expenditures by companies that performed R&D and companies that only made payments for R&D to other organizations. Components may not add to totals due to rounding. Tax data include extramural payments for R&D in Canada only; extramural payments for R&D outside of Canada were imputed for these records (see Survey Methodology).

Table 10-2
Business enterprise research and development extramural payments by industry — And by location of recipient, 2012p

	Canada	Foreign	Total location of recipient
	millions of dollars		
Total all industries	**2,568** A	**411** C	**2,978** A
Agriculture, forestry, fishing and hunting	**x**	**x**	**11** A
Agriculture	9 A	0 A	**9** A
Forestry, logging and support activities for forestry	x	x	**2** A
Fishing, hunting, trapping and animal aquaculture	1 A	0 A	**1** A
Mining and oil and gas extraction	**195** D	**9** B	**205** D
Oil and gas extraction, contract drilling and related services	161 E	8 B	**169** E
Mining and related support activities	35 A	1 E	**36** A
Utilities	**x**	**x**	**127** A
Electric power generation, transmission and distribution	x	x	**x**
Other utilities	x	x	**x**
Construction	**14** A	**0** A	**14** A
Manufacturing	**627** A	**92** E	**719** A
Food manufacturing	x	x	**15** A
Beverage and tobacco product manufacturing	4 A	0 A	**4** A
Textiles	x	x	**2** A
Wood product manufacturing	9 A	x	**x**
Paper manufacturing	x	x	**17** A
Printing and related support activities	6 E	0 A	**6** E
Petroleum and coal products manufacturing	x	x	**12** A
Pharmaceutical and medicine manufacturing	110 A	F	**140** A
Other chemicals	69 A	F	**72** A
Plastic product manufacturing	14 A	0 A	**14** A
Rubber product manufacturing	3 A	0 A	**3** A
Non-metallic mineral product manufacturing	4 A	0 A	**4** A
Primary metal (ferrous)	4 A	x	**x**
Primary metal (non-ferrous)	18 A	x	**x**
Fabricated metal product manufacturing	13 A	x	**x**
Machinery manufacturing	50 A	0 A	**50** A
Computer and peripheral equipment manufacturing	5 A	1 A	**6** A
Communications equipment manufacturing	26 A	18 D	**43** A
Semiconductor and other electronic component manufacturing	15 A	x	**x**
Navigational, measuring, medical and control instrument manufacturing	x	x	**29** A
Other computer and electronic products	2 A	0 A	**2** A
Electrical equipment, appliance and component manufacturing	x	x	**8** E
Motor vehicle and parts	19 A	x	**x**
Aerospace products and parts manufacturing	x	x	**x**
All other transportation equipment	x	x	**10** A
Furniture and related product manufacturing	2 A	0 A	**2** A
Other manufacturing industries	34 A	3 E	**37** A
Services	**1,596** A	**306** C	**1,902** A
Wholesale trade	316 A	97 D	**414** A
Retail trade	x	x	**11** A
Transportation and warehousing	x	x	**24** C
Information and cultural industries	x	x	**379** A
Finance, insurance and real estate	302 B	0 A	**302** B
Architectural, engineering and related services	52 A	F	**54** A
Computer systems design and related services	185 A	39 E	**224** A
Management, scientific and technical consulting services	x	x	**24** A
Scientific research and development services	289 A	68 E	**357** A
Health care and social assistance	x	x	**35** A
All other services	73 A	F	**79** A

Note(s): Extramural payments are expenditures made for R&D performed by other organizations in Canada and/or in other countries. Other organizations include parent, affiliated and subsidiary companies, other non-related companies, private non-profit organizations, universities, hospitals, industrial research institutes or associations, provincial research organizations, and other organizations including governments and individuals. Extramural R&D payments include expenditures by companies that performed R&D and companies that only made payments for R&D to other organizations. Components may not add to totals due to rounding. Tax data include extramural payments for R&D in Canada only; extramural payments for R&D outside of Canada were imputed for these records (see Survey Methodology).

Table 11

Business enterprise foreign receipts and payments for technological services by research and development and other

	Receipts			Payments			Balance		
	Research and development, foreign receipts	Other foreign receipts	Total foreign receipts	Research and development, foreign payments	Other foreign payments	Total foreign payments	Research and development, balance	Other balance	Total balance
	millions of dollars								
2012 p	1,725	917	2,642	411	474	884	1,314	444	1,758
2011 r	1,752	867	2,619	411	340	751	1,341	527	1,868
2010 r	1,853	1,239	3,091	376	207	583	1,477	1,032	2,509
2009 r	2,003	634	2,637	627	315	941	1,376	320	1,696
2008	2,082	857	2,939	873	239	1,112	1,209	619	1,827
2007	2,663	709	3,372	1,302	339	1,641	1,361	370	1,731
2006	2,113	721	2,834	1,054	336	1,390	1,059	385	1,444
2005	2,327	754	3,081	1,146	317	1,463	1,181	438	1,618
2004	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

Note(s): Data are from Research and Development in Canadian Industry survey respondents only. Components may not add to totals due to rounding.

Table 12

Business enterprise expenditures made and payments received for intellectual property and other technology-related services, 2012p

	Expenditures made	Payments received
	millions of dollars	
Total intellectual property and other technology related services	**952**	**1,561**
Patents	563	1,031
Copyrights	1	x
Trademarks	30	x
Industrial designs and intergrated circuit topography designs	39	14
Technical assistance, industrial processes and know-how	320	512

Note(s): Data are from the Research and Development in Canadian Industry respondents only. Components may not add to totals due to rounding. Personnel counts are reported as full-time equivalent.

Table 13

Business enterprise energy research and development intramural expenditures and extramural payments made outside of Canada, by area of technology, 2012[p]

	Total intramural research and development	Total extramural payments outside of Canada
	millions of dollars	
Total energy	**2,023**	**23**
Fossil fuels	**1,488**	**12**
Crude oils and natural gas	554	4
Oil sands and heavy crude oil	886	x
Refining, processing and upgrading	32	x
Coal production, preparation and processing	1	0
Transportation of fossil fuels	14	x
Renewable energy resources	**86**	**3**
Solar	3	0
Wind-energy	10	x
Bio-energy	34	x
Hydro	31	1
Other renewable energy	8	0
Nuclear fission and fusion	**72**	**x**
Electric Power	**100**	**2**
Generation in utility sector	x	x
Combine heat and power in industry, buildings	x	x
Electricity transmission, distribution and storage	81	x
Hydrogen and fuel cells	**62**	**x**
Hydrogen	13	x
Fuel cells	48	x
Energy efficiency	**80**	**2**
Industry	35	x
Residential, institutional and commercial	15	x
Transportation of fossil fuels	19	x
Other energy efficiency	13	x
Other related technologies	**136**	**x**

Note(s): Data are from the Energy Research and Development Expenditures by Area of Technology survey. Components may not add to totals due to rounding.

Table 14-1
Research and development performers — By industry and by country of control, 2011[p]

	Canada	Foreign	Total country of control
	number		
Total all industries	**22,209**	**1,020**	**23,229**
Agriculture, forestry, fishing and hunting	**x**	**x**	**862**
Agriculture	x	x	752
Forestry and logging	x	x	65
Fishing, hunting and trapping	x	x	45
Mining and oil and gas extraction	**175**	**35**	**210**
Oil and gas extraction	117	19	136
Mining	58	16	74
Utilities	**x**	**x**	**168**
Electric power	x	x	41
Other utilities	x	x	127
Construction	**797**	**18**	**815**
Manufacturing	**8,286**	**533**	**8,819**
Food	609	27	636
Beverage and tobacco	x	x	76
Textile	x	x	151
Wood products	x	x	283
Paper	116	19	135
Printing	x	x	357
Petroleum and coal products	x	x	43
Pharmaceutical and medicine	95	22	117
Other chemicals	407	65	472
Plastic products	468	43	511
Rubber products	x	x	65
Non-metallic mineral products	208	21	229
Primary metal (ferrous)	x	x	74
Primary metal (non-ferrous)	x	x	80
Fabricated metal products	1,252	37	1,289
Machinery	1,400	51	1,451
Computer and peripheral equipment	x	x	87
Communications equipment	121	18	139
Semiconductor and other electronic components	x	x	176
Navigational, measuring, medical and control instruments	316	30	346
Other computer and electronic products	x	x	66
Electrical equipment, appliance and components	291	28	319
Motor vehicle and parts	272	34	306
Aerospace products and parts	76	15	91
All other transportation equipment	x	x	104
Furniture and related products	x	x	307
Other manufacturing industries	891	18	909
Services	**11,931**	**424**	**12,355**
Wholesale trade	1,888	117	2,005
Retail trade	x	x	541
Transportation and warehousing	x	x	204
Information and cultural industries	1,086	64	1,150
Finance, insurance and real estate	360	16	376
Architectural, engineering and related services	1,001	36	1,037
Computer system design and related services	3,086	87	3,173
Management, scientific and technical consulting services	x	x	536
Scientific research and development services	946	48	994
Health care and social assistance	x	x	453
All other services	1,849	37	1,886

Table 14-2
Research and development performers — By province, 2007 to 2011

	2007	2008	2009	2010 [r]	2011 [p]	Absolute change from 2007 to 2011	Change from 2007 to 2011
	number						percent
Canada - total	**23,172**	**24,753**	**25,915**	**25,248**	**23,229**	**57**	**0**
Total - Multi-province	**24,628**	**26,440**	**27,353**	**26,538**	**24,475**	**-153**	**-1**
Atlantic Canada	879	1,097	1,150	979	982	103	12
Newfoundland and Labrador	148	178	180	159	148	0	0
Prince Edward Island	67	96	102	84	80	13	19
Nova Scotia	387	480	508	426	431	44	11
New Brunswick	277	343	360	310	323	46	17
Quebec	9,202	9,114	9,136	8,219	8,089	-1,113	-12
Ontario	9,979	10,694	10,820	11,999	9,628	-351	-4
Manitoba	440	531	592	499	507	67	15
Saskatchewan	287	369	446	389	421	134	47
Alberta	1,446	1,740	1,963	1,659	1,806	360	25
British Columbia [1]	2,395	2,895	3,246	2,794	3,042	647	27

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 14-3
Research and development performers — As a percentage of enterprises with one or more employees, 2007 to 2011

	2007	2008	2009	2010 r	2011 p
	percent				
Total all industries	**2.4**	**2.5**	**2.6**	**2.5**	**2.3**
Agriculture, forestry, fishing and hunting	**2.0**	**2.2**	**2.2**	**2.1**	**1.7**
Agriculture	2.5	2.6	2.6	2.4	2.0
Forestry and logging	1.1	1.2	1.3	1.2	0.9
Fishing, hunting and trapping	0.9	1.0	1.1	1.0	0.9
Mining and oil and gas extraction	**2.5**	**2.6**	**2.8**	**3.1**	**2.7**
Oil and gas extraction	2.0	2.0	2.3	2.5	2.3
Mining	4.5	5.0	4.9	5.4	3.9
Utilities	**4.6**	**5.0**	**5.3**	**4.8**	**5.0**
Electric power	7.9	9.6	10.9	10.5	12.8
Other utilities	4.0	4.5	4.7	4.2	4.1
Construction	**0.7**	**0.7**	**0.8**	**0.7**	**0.6**
Manufacturing	**18.6**	**19.7**	**20.3**	**20.0**	**18.3**
Food	14.5	15.6	16.0	15.8	13.3
Beverage and tobacco	12.9	14.7	15.8	15.8	11.6
Textile	13.0	13.9	13.9	14.6	12.8
Wood products	9.7	10.7	10.8	10.1	8.6
Paper	25.5	28.3	26.8	29.9	26.9
Printing	8.2	9.4	10.4	10.0	9.1
Petroleum and coal products	33.3	30.2	38.8	31.6	33.3
Pharmaceutical and medicine	50.6	46.7	44.4	45.6	44.5
Other chemicals	33.2	36.0	35.1	34.6	33.5
Plastic products	32.0	34.2	34.7	35.0	31.2
Rubber products	24.7	26.4	25.9	29.4	26.4
Non-metallic mineral products	13.7	14.0	14.6	14.3	13.3
Primary metal (ferrous)	22.8	29.4	26.6	25.5	29.8
Primary metal (non-ferrous)	35.6	35.5	37.7	35.3	31.1
Fabricated metal products	18.6	19.2	20.0	19.1	17.2
Machinery	32.6	33.5	34.4	33.9	31.3
Computer and peripheral equipment	38.5	39.0	37.3	39.7	40.3
Communications equipment	58.3	57.3	52.9	54.3	51.7
Semiconductor and other electronic components	43.4	47.7	47.1	47.8	45.8
Navigational, measuring, medical and control instruments	46.3	49.9	51.6	52.2	51.0
Other computer and electronic products	27.8	30.7	28.0	32.4	37.7
Electrical equipment, appliance and components	30.6	33.9	34.3	33.1	32.4
Motor vehicle and parts	28.3	30.0	29.8	29.3	27.0
Aerospace products and parts	38.6	40.4	41.0	44.8	42.5
All other transportation equipment	21.5	19.6	23.1	21.6	21.8
Furniture and related products	9.3	10.0	10.5	9.5	7.5
Other manufacturing industries	11.5	12.3	13.2	13.6	12.6
Services	**1.5**	**1.6**	**1.7**	**1.7**	**1.6**
Wholesale trade	4.1	4.3	4.6	4.5	4.1
Retail trade	0.5	0.6	0.6	0.6	0.5
Transportation and warehousing	0.5	0.5	0.5	0.5	0.4
Information and cultural industries	7.6	8.5	9.3	9.7	10.3
Finance, insurance and real estate	0.6	0.6	0.7	0.6	0.6
Architectural, engineering and related services	5.4	6.0	6.1	6.2	5.9
Computer system design and related services	12.6	13.0	13.2	13.5	12.5
Management, scientific and technical consulting services	1.9	2.2	2.3	2.3	2.1
Scientific research and development services	41.4	40.2	41.9	40.9	41.0
Health care and social assistance	0.3	0.4	0.4	0.5	0.5
All other services	0.5	0.6	0.7	0.6	0.6

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

Table 14-4
Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011[p]

	NAICS Code	Performers
		number
Total all industries		**23,229**
Agriculture, Forestry, Fishing and Hunting		**862**
Agriculture		**752**
Soybean Farming	111110	1
Oilseed (except Soybean) Farming	111120	4
Dry Pea and Bean Farming	111130	3
Wheat Farming	111140	3
Corn Farming	111150	14
Rice Farming	111160	1
Other Grain Farming	111190	21
Potato Farming	111211	37
Other Vegetable (except Potato) and Melon Farming	111219	73
Orange Groves	111310	0
Citrus (except Orange) Groves	111320	0
Non-Citrus Fruit and Tree Nut Farming	111330	79
Mushroom Production	111411	19
Other Food Crops Grown Under Cover	111419	58
Nursery and Tree Production	111421	51
Floriculture Production	111422	82
Tobacco Farming	111910	4
Cotton Farming	111920	0
Sugar Cane Farming	111930	0
Hay Farming	111940	4
Fruit and Vegetable Combination Farming	111993	17
Maple Syrup and Products Production	111994	5
All Other Miscellaneous Crop Farming	111999	32
Beef Cattle Ranching and Farming, including Feedlots	112110	13
Dairy Cattle and Milk Production	112120	69
Hog and Pig Farming	112210	44
Chicken Egg Production	112310	6
Broiler and Other Meat-Type Chicken Production	112320	10
Turkey Production	112330	3
Poultry Hatcheries	112340	3
Combination Poultry and Egg Production	112391	3
All Other Poultry Production	112399	4
Sheep Farming	112410	2
Goat Farming	112420	1
Apiculture	112910	8
Horse and Other Equine Production	112920	0
Fur-Bearing Animal and Rabbit Production	112930	8
Livestock Combination Farming	112991	14
All Other Miscellaneous Animal Production	112999	5
Support Activities for Crop Production	115110	34
Support Activities for Animal Production	115210	17
Forestry and Logging		**65**
Timber Tract Operations	113110	1
Forest Nurseries and Gathering of Forest Products	113210	9
Logging (except Contract)	113311	10
Contract Logging	113312	17
Support Activities for Forestry	115310	28
Fishing, Hunting and Trapping		**45**
Aquaculture	112510	39
Salt Water Fishing	114113	6
Inland Fishing	114114	0
Hunting and Trapping	114210	0
Mining and Oil and Gas Extraction		**210**
Oil and Gas Extraction		**136**
Conventional Oil and Gas Extraction	211113	46
Non-Conventional Oil Extraction	211114	10
Oil and Gas Contract Drilling	213111	11
Services to Oil and Gas Extraction	213118	69
Mining		**74**
Bituminous Coal Mining	212114	2
Subbituminous Coal Mining	212115	0
Lignite Coal Mining	212116	0

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Iron Ore Mining	212210	3
Gold and Silver Ore Mining	212220	5
Lead-Zinc Ore Mining	212231	0
Nickel-Copper Ore Mining	212232	1
Copper-Zinc Ore Mining	212233	3
Uranium Ore Mining	212291	1
All Other Metal Ore Mining	212299	1
Granite Mining and Quarrying	212314	1
Limestone Mining and Quarrying	212315	2
Marble Mining and Quarrying	212316	1
Sandstone Mining and Quarrying	212317	1
Sand and Gravel Mining and Quarrying	212323	11
Shale, Clay and Refractory Mineral Mining and Quarrying	212326	1
Diamond Mines	212392	2
Salt Mines	212393	2
Asbestos Mining	212394	0
Gypsum Mining	212395	1
Potash Mining	212396	1
Peat Extraction	212397	7
All Other Non-Metallic Mineral Mining and Quarrying	212398	2
Contract Drilling (except Oil and Gas)	213117	4
Other Support Activities for Mining	213119	22
Utilities		**168**
Electric Power		**41**
Hydro-Electric Power Generation	221111	8
Fossil-Fuel Electric Power Generation	221112	7
Nuclear Electric Power Generation	221113	1
Other Electric Power Generation	221119	20
Electric Bulk Power Transmission and Control	221121	1
Electric Power Distribution	221122	4
Other Utilities		**127**
Natural Gas Distribution	221210	4
Water Supply and Irrigation Systems	221310	17
Sewage Treatment Facilities	221320	4
Steam and Air-Conditioning Supply	221330	0
Waste Collection	562110	15
Waste Treatment and Disposal	562210	35
Remediation Services	562910	34
Material Recovery Facilities	562920	9
All Other Waste Management Services	562990	9
Construction		**815**
Residential Building Construction	236110	68
Industrial Building and Structure Construction	236210	13
Commercial and Institutional Building Construction	236220	28
Water and Sewer Line and Related Structures Construction	237110	25
Oil and Gas Pipeline and Related Structures Construction	237120	18
Power and Communication Line and Related Structures Construction	237130	23
Land Subdivision	237210	10
Highway, Street and Bridge Construction	237310	61
Other Heavy and Civil Engineering Construction	237990	18
Poured Concrete Foundation and Structure Contractors	238110	23
Structural Steel and Precast Concrete Contractors	238120	8
Framing Contractors	238130	4
Masonry Contractors	238140	8
Glass and Glazing Contractors	238150	16
Roofing Contractors	238160	16
Siding Contractors	238170	8
Other Foundation, Structure and Building Exterior Contractors	238190	15
Electrical Contractors and Other Wiring Installation Contractors	238210	108
Plumbing, Heating and Air-Conditioning Contractors	238220	106
Elevator and Escalator Installation Contractors	238291	6
All Other Building Equipment Contractors	238299	38
Drywall and Insulation Contractors	238310	7
Painting and Wall Covering Contractors	238320	24
Flooring Contractors	238330	17
Tile and Terrazzo Contractors	238340	6
Finish Carpentry Contractors	238350	41
Other Building Finishing Contractors	238390	15
Site Preparation Contractors	238910	47

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
All Other Specialty Trade Contractors	238990	38
Manufacturing		**8,819**
Food		**636**
Dog and Cat Food Manufacturing	311111	8
Other Animal Food Manufacturing	311119	36
Flour Milling	311211	2
Rice Milling and Malt Manufacturing	311214	5
Wet Corn Milling	311221	2
Oilseed Processing	311224	6
Fat and Oil Refining and Blending	311225	2
Breakfast Cereal Manufacturing	311230	3
Sugar Manufacturing	311310	0
Chocolate and Chocolate Confectionery Manufacturing from Cacao Beans	311351	3
Confectionery Manufacturing from Purchased Chocolate	311352	14
Non-Chocolate Confectionery Manufacturing	311340	18
Frozen Food Manufacturing	311410	32
Fruit and Vegetable Canning, Pickling and Drying	311420	42
Fluid Milk Manufacturing	311511	11
Butter, Cheese, and Dry and Condensed Dairy Product Manufacturing	311515	35
Ice Cream and Frozen Dessert Manufacturing	311520	9
Animal (except Poultry) Slaughtering	311611	16
Rendering and Meat Processing from Carcasses	311614	44
Poultry Processing	311615	25
Seafood Product Preparation and Packaging	311710	37
Retail Bakeries	311811	37
Commercial Bakeries and Frozen Bakery Product Manufacturing	311814	88
Cookie and Cracker Manufacturing	311821	13
Flour Mixes, Dough, and Pasta Manufacturing from Purchased Flour	311824	14
Tortilla Manufacturing	311830	1
Roasted Nut and Peanut Butter Manufacturing	311911	6
Other Snack Food Manufacturing	311919	7
Coffee and Tea Manufacturing	311920	14
Flavouring Syrup and Concentrate Manufacturing	311930	9
Seasoning and Dressing Manufacturing	311940	24
All Other Food Manufacturing	311990	73
Beverages and Tobacco		**76**
Soft Drink and Ice Manufacturing	312110	5
Breweries	312120	30
Wineries	312130	34
Distilleries	312140	6
Tobacco Stemming and Redrying	312210	0
Tobacco Product Manufacturing	312220	1
Textile		**151**
Fibre, Yarn and Thread Mills	313110	9
Broad-Woven Fabric Mills	313210	20
Narrow Fabric Mills and Schiffli Machine Embroidery	313220	12
Nonwoven Fabric Mills	313230	10
Knit Fabric Mills	313240	12
Textile and Fabric Finishing	313310	21
Fabric Coating	313320	3
Carpet and Rug Mills	314110	7
Curtain and Linen Mills	314120	10
Textile Bag and Canvas Mills	314910	24
All Other Textile Product Mills	314990	23
Wood Products		**283**
Sawmills (except Shingle and Shake Mills)	321111	49
Shingle and Shake Mills	321112	3
Wood Preservation	321114	5
Hardwood Veneer and Plywood Mills	321211	14
Softwood Veneer and Plywood Mills	321212	5
Structural Wood Product Manufacturing	321215	15
Particle Board and Fibreboard Mills	321216	11
Waferboard Mills	321217	2
Wood Window and Door Manufacturing	321911	42
Other Millwork	321919	66
Wood Container and Pallet Manufacturing	321920	17
Manufactured (Mobile) Home Manufacturing	321991	5

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Prefabricated Wood Building Manufacturing	321992	12
All Other Miscellaneous Wood Product Manufacturing	321999	37
Paper		**135**
Mechanical Pulp Mills	322111	2
Chemical Pulp Mills	322112	5
Paper (except Newsprint) Mills	322121	11
Newsprint Mills	322122	5
Paperboard Mills	322130	6
Corrugated and Solid Fibre Box Manufacturing	322211	28
Folding Paperboard Box Manufacturing	322212	20
Other Paperboard Container Manufacturing	322219	10
Paper Bag and Coated and Treated Paper Manufacturing	322220	25
Stationery Product Manufacturing	322230	6
Sanitary Paper Product Manufacturing	322291	5
All Other Converted Paper Product Manufacturing	322299	12
Printing		**357**
Commercial Screen Printing	323113	39
Quick Printing	323114	12
Digital Printing	323115	30
Manifold Business Forms Printing	323116	19
Other Printing	323119	216
Support Activities for Printing	323120	41
Petroleum and Coal Products		**43**
Petroleum Refineries	324110	6
Asphalt Paving Mixture and Block Manufacturing	324121	9
Asphalt Shingle and Coating Material Manufacturing	324122	5
Other Petroleum and Coal Product Manufacturing	324190	23
Pharmaceutical and Medicine		**117**
Pharmaceutical and Medicine Manufacturing	325410	117
Other Chemical		**472**
Petrochemical Manufacturing	325110	4
Industrial Gas Manufacturing	325120	5
Synthetic Dye and Pigment Manufacturing	325130	10
Alkali and Chlorine Manufacturing	325181	1
All Other Basic Inorganic Chemical Manufacturing	325189	18
Other Basic Organic Chemical Manufacturing	325190	32
Resin and Synthetic Rubber Manufacturing	325210	34
Artificial and Synthetic Fibres and Filaments Manufacturing	325220	4
Chemical Fertilizer (except Potash) Manufacturing	325313	14
Mixed Fertilizer Manufacturing	325314	14
Pesticide and Other Agricultural Chemical Manufacturing	325320	9
Paint and Coating Manufacturing	325510	63
Adhesive Manufacturing	325520	24
Soap and Cleaning Compound Manufacturing	325610	59
Toilet Preparation Manufacturing	325620	64
Printing Ink Manufacturing	325910	15
Explosives Manufacturing	325920	2
Custom Compounding of Purchased Resins	325991	8
All Other Miscellaneous Chemical Product Manufacturing	325999	92
Plastic Product		**511**
Plastic Bag and Pouch Manufacturing	326111	35
Plastic Film and Sheet Manufacturing	326114	34
Unlaminated Plastic Profile Shape Manufacturing	326121	30
Plastic Pipe and Pipe Fitting Manufacturing	326122	22
Laminated Plastic Plate, Sheet (except Packaging) and Shape Manufacturing	326130	8
Polystyrene Foam Product Manufacturing	326140	19
Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	20
Plastic Bottle Manufacturing	326160	13
Plastic Plumbing Fixture Manufacturing	326191	17
Motor Vehicle Plastic Parts Manufacturing	326193	47
Plastic Window and Door Manufacturing	326196	35
All Other Plastic Product Manufacturing	326198	231
Rubber Product		**65**
Tire Manufacturing	326210	3
Rubber and Plastic Hose and Belting Manufacturing	326220	10
Other Rubber Product Manufacturing	326290	52

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Non-Metallic Mineral Products		**229**
Pottery, Ceramics and Plumbing Fixture Manufacturing	327110	5
Clay Building Material and Refractory Manufacturing	327120	16
Glass Manufacturing	327214	13
Glass Product Manufacturing from Purchased Glass	327215	29
Cement Manufacturing	327310	3
Ready-Mix Concrete Manufacturing	327320	29
Concrete Pipe, Brick and Block Manufacturing	327330	28
Other Concrete Product Manufacturing	327390	39
Lime Manufacturing	327410	3
Gypsum Product Manufacturing	327420	8
Abrasive Product Manufacturing	327910	9
All Other Non-Metallic Mineral Product Manufacturing	327990	47
Primary Metal (Ferrous)		**74**
Iron and Steel Mills and Ferro-Alloy Manufacturing	331110	16
Iron and Steel Pipes and Tubes Manufacturing from Purchased Steel	331210	19
Cold-Rolled Steel Shape Manufacturing	331221	7
Steel Wire Drawing	331222	2
Iron Foundries	331511	17
Steel Foundries	331514	13
Primary Metal (Non-Ferrous)		**80**
Primary Production of Alumina and Aluminum	331313	7
Aluminum Rolling, Drawing, Extruding and Alloying	331317	10
Non-Ferrous Metal (except Aluminum) Smelting and Refining	331410	14
Copper Rolling, Drawing, Extruding and Alloying	331420	6
Non-Ferrous Metal (except Copper and Aluminum) Rolling, Drawing, Extruding and Alloying	331490	8
Non-Ferrous Die-Casting Foundries	331523	16
Non-Ferrous Foundries (except Die-Casting)	331529	19
Fabricated Metal Product		**1,289**
Forging	332113	19
Stamping	332118	58
Cutlery and Hand Tool Manufacturing	332210	39
Prefabricated Metal Building and Component Manufacturing	332311	23
Concrete Reinforcing Bar Manufacturing	332314	2
Other Plate Work and Fabricated Structural Product Manufacturing	332319	93
Metal Window and Door Manufacturing	332321	72
Other Ornamental and Architectural Metal Product Manufacturing	332329	95
Power Boiler and Heat Exchanger Manufacturing	332410	14
Metal Tank (Heavy Gauge) Manufacturing	332420	38
Metal Can Manufacturing	332431	1
Other Metal Container Manufacturing	332439	25
Hardware Manufacturing	332510	20
Spring (Heavy Gauge) Manufacturing	332611	3
Other Fabricated Wire Product Manufacturing	332619	32
Machine Shops	332710	466
Turned Product and Screw, Nut and Bolt Manufacturing	332720	31
Coating, Engraving, Heat Treating and Allied Activities	332810	115
Metal Valve Manufacturing	332910	26
Ball and Roller Bearing Manufacturing	332991	9
All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	108
Machinery		**1,451**
Agricultural Implement Manufacturing	333110	121
Construction Machinery Manufacturing	333120	52
Mining and Oil and Gas Field Machinery Manufacturing	333130	92
Sawmill and Woodworking Machinery Manufacturing	333245	30
Rubber and Plastics Industry Machinery Manufacturing	333246	37
Paper Industry Machinery Manufacturing	333247	7
All Other Industrial Machinery Manufacturing	333248	110
Commercial and Service Industry Machinery Manufacturing	333310	114
Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing	333413	43
Heating Equipment and Commercial Refrigeration Equipment Manufacturing	333416	114
Industrial Mould Manufacturing	333511	117
Other Metalworking Machinery Manufacturing	333519	247
Turbine and Turbine Generator Set Unit Manufacturing	333611	24
Other Engine and Power Transmission Equipment Manufacturing	333619	25
Pump and Compressor Manufacturing	333910	35

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011[p]

	NAICS Code	Performers
		number
Material Handling Equipment Manufacturing	333920	109
All Other General-Purpose Machinery Manufacturing	333990	174
Computer and Peripheral Equipment		**87**
Computer and Peripheral Equipment Manufacturing	334110	87
Communications Equipment		**139**
Telephone Apparatus Manufacturing	334210	24
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	74
Other Communications Equipment Manufacturing	334290	41
Semiconductor and Other Electronic Component		**176**
Semiconductor and Other Electronic Component Manufacturing	334410	176
Navigational, Measuring, Medical and Control Instruments		**346**
Navigational and Guidance Instruments Manufacturing	334511	40
Measuring, Medical and Controlling Devices Manufacturing	334512	306
Other Computer and Electronic Product		**66**
Audio and Video Equipment Manufacturing	334310	42
Manufacturing and Reproducing Magnetic and Optical Media	334610	24
Electrical Equipment, Appliance and Component		**319**
Electric Lamp Bulb and Parts Manufacturing	335110	4
Lighting Fixture Manufacturing	335120	55
Small Electrical Appliance Manufacturing	335210	21
Major Kitchen Appliance Manufacturing	335223	6
Other Major Appliance Manufacturing	335229	10
Power, Distribution and Specialty Transformers Manufacturing	335311	28
Motor and Generator Manufacturing	335312	15
Switchgear and Switchboard, and Relay and Industrial Control Apparatus Manufacturing	335315	74
Battery Manufacturing	335910	8
Communication and Energy Wire and Cable Manufacturing	335920	23
Wiring Device Manufacturing	335930	15
All Other Electrical Equipment and Component Manufacturing	335990	60
Motor Vehicle and Parts		**306**
Automobile and Light-Duty Motor Vehicle Manufacturing	336110	11
Heavy-Duty Truck Manufacturing	336120	13
Motor Vehicle Body Manufacturing	336211	40
Truck Trailer Manufacturing	336212	40
Motor Home, Travel Trailer and Camper Manufacturing	336215	10
Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	19
Motor Vehicle Electrical and Electronic Equipment Manufacturing	336320	24
Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	6
Motor Vehicle Brake System Manufacturing	336340	9
Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	13
Motor Vehicle Seating and Interior Trim Manufacturing	336360	14
Motor Vehicle Metal Stamping	336370	37
Other Motor Vehicle Parts Manufacturing	336390	70
Aerospace Product and Parts		**91**
Aerospace Product and Parts Manufacturing	336410	91
All Other Transportation Equipment		**104**
Railroad Rolling Stock Manufacturing	336510	9
Ship Building and Repairing	336611	9
Boat Building	336612	40
Other Transportation Equipment Manufacturing	336990	46
Furniture and Related Product		**307**
Wood Kitchen Cabinet and Counter Top Manufacturing	337110	68
Upholstered Household Furniture Manufacturing	337121	20
Other Wood Household Furniture Manufacturing	337123	55
Household Furniture (except Wood and Upholstered) Manufacturing	337126	14
Institutional Furniture Manufacturing	337127	27
Wood Office Furniture, including Custom Architectural Woodwork, Manufacturing	337213	29
Office Furniture (except Wood) Manufacturing	337214	21
Showcase, Partition, Shelving and Locker Manufacturing	337215	55
Mattress Manufacturing	337910	10
Blind and Shade Manufacturing	337920	8
Other Manufacturing Industries		**909**
Hosiery and Sock Mills	315110	6

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Other Clothing Knitting Mills	315190	19
Cut and Sew Clothing Contracting	315210	33
Men's and Boys' Cut and Sew Clothing Manufacturing	315220	29
Infants' Cut and Sew Clothing Manufacturing	315241	1
Women's and Girls' Cut and Sew Clothing Manufacturing	315249	54
Fur and Leather Clothing Manufacturing	315281	20
All Other Cut and Sew Clothing Manufacturing	315289	16
Clothing Accessories and Other Clothing Manufacturing	315990	23
Leather and Hide Tanning and Finishing	316110	7
Footwear Manufacturing	316210	16
Other Leather and Allied Product Manufacturing	316990	7
Medical Equipment and Supplies Manufacturing	339110	208
Jewellery and Silverware Manufacturing	339910	21
Sporting and Athletic Goods Manufacturing	339920	69
Doll, Toy and Game Manufacturing	339930	25
Office Supplies (except Paper) Manufacturing	339940	13
Sign Manufacturing	339950	56
All Other Miscellaneous Manufacturing	339990	286
Services		**12,355**
Wholesale Trade		**2,005**
Live Animal Wholesaler-Distributors	411110	5
Oilseed and Grain Wholesaler-Distributors	411120	11
Nursery Stock and Plant Wholesaler-Distributors	411130	18
Other Farm Product Wholesaler-Distributors	411190	5
Petroleum Product Wholesaler-Distributors	412110	7
General-Line Food Wholesaler-Distributors	413110	21
Dairy and Milk Products Wholesaler-Distributors	413120	7
Poultry and Egg Wholesaler-Distributors	413130	6
Fish and Seafood Product Wholesaler-Distributors	413140	14
Fresh Fruit and Vegetable Wholesaler-Distributors	413150	31
Red Meat and Meat Product Wholesaler-Distributors	413160	20
Other Specialty-Line Food Wholesaler-Distributors	413190	116
Non-Alcoholic Beverage Wholesaler-Distributors	413210	9
Alcoholic Beverage Wholesaler-Distributors	413220	2
Cigarette and Tobacco Product Wholesaler-Distributors	413310	1
Clothing and Clothing Accessories Wholesaler-Distributors	414110	89
Footwear Wholesaler-Distributors	414120	4
Piece Goods, Notions and Other Dry Goods Wholesaler-Distributors	414130	25
Home Entertainment Equipment Wholesaler-Distributors	414210	5
Household Appliance Wholesaler-Distributors	414220	9
China, Glassware, Crockery and Pottery Wholesaler-Distributors	414310	1
Floor Covering Wholesaler-Distributors	414320	4
Linen, Drapery and Other Textile Furnishings Wholesaler-Distributors	414330	9
Other Home Furnishings Wholesaler-Distributors	414390	20
Jewellery and Watch Wholesaler-Distributors	414410	4
Book, Periodical and Newspaper Wholesaler-Distributors	414420	4
Photographic Equipment and Supplies Wholesaler-Distributors	414430	6
Sound Recording Wholesalers	414440	0
Video Cassette Wholesalers	414450	0
Toy and Hobby Goods Wholesaler-Distributors	414460	9
Amusement and Sporting Goods Wholesaler-Distributors	414470	22
Pharmaceuticals and Pharmacy Supplies Wholesaler-Distributors	414510	50
Toiletries, Cosmetics and Sundries Wholesaler-Distributors	414520	36
New and Used Automobile and Light-Duty Truck Wholesaler-Distributors	415110	1
Truck, Truck Tractor and Bus Wholesaler-Distributors	415120	2
Recreational and Other Motor Vehicles Wholesaler-Distributors	415190	4

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011[p]

	NAICS Code	Performers
		number
Tire Wholesaler-Distributors	415210	2
Other New Motor Vehicle Parts and Accessories Wholesaler-Distributors	415290	46
Used Motor Vehicle Parts and Accessories Wholesaler-Distributors	415310	2
Electrical Wiring and Construction Supplies Wholesaler-Distributors	416110	59
Plumbing, Heating and Air-Conditioning Equipment and Supplies Wholesaler-Distributors	416120	69
Metal Service Centres	416210	36
General-Line Building Supplies Wholesaler-Distributors	416310	11
Lumber, Plywood and Millwork Wholesaler-Distributors	416320	34
Hardware Wholesaler-Distributors	416330	28
Paint, Glass and Wallpaper Wholesaler-Distributors	416340	8
Other Specialty-Line Building Supplies Wholesaler-Distributors	416390	38
Farm, Lawn and Garden Machinery and Equipment Wholesaler-Distributors	417110	37
Construction and Forestry Machinery, Equipment and Supplies Wholesaler-Distributors	417210	11
Mining and Oil and Gas Well Machinery, Equipment and Supplies Wholesaler-Distributors	417220	25
Industrial Machinery, Equipment and Supplies Wholesaler-Distributors	417230	206
Computer, Computer Peripheral and Pre-Packaged Software Wholesaler-Distributors	417310	125
Electronic Components, Navigational and Communications Equipment and Supplies Wholesaler-Distributors	417320	105
Office and Store Machinery and Equipment Wholesaler-Distributors	417910	20
Service Establishment Machinery, Equipment and Supplies Wholesaler-Distributors	417920	22
Professional Machinery, Equipment and Supplies Wholesaler-Distributors	417930	106
All Other Machinery, Equipment and Supplies Wholesaler-Distributors	417990	41
Recyclable Metal Wholesaler-Distributors	418110	14
Recyclable Paper and Paperboard Wholesaler-Distributors	418120	2
Other Recyclable Material Wholesaler-Distributors	418190	39
Stationery and Office Supplies Wholesaler-Distributors	418210	10
Other Paper and Disposable Plastic Product Wholesaler-Distributors	418220	19
Agricultural Feed Wholesaler-Distributors	418310	15
Seed Wholesaler-Distributors	418320	11
Agricultural Chemical and Other Farm Supplies Wholesaler-Distributors	418390	21
Chemical (except Agricultural) and Allied Product Wholesaler-Distributors	418410	75
Log and Wood Chip Wholesaler-Distributors	418910	2
Mineral, Ore and Precious Metal Wholesaler-Distributors	418920	1
Second-Hand Goods (except Machinery and Automotive) Wholesaler-Distributors	418930	2
All Other Wholesaler-Distributors	418990	97
Business-to-Business Electronic Markets	419110	3
Wholesale Trade Agents and Brokers	419120	86
Retail Trade		**541**
New Car Dealers	441110	1
Used Car Dealers	441120	5
Recreational Vehicle Dealers	441210	4
Motorcycle, Boat and Other Motor Vehicle Dealers	441220	19
Automotive Parts and Accessories Stores	441310	20
Tire Dealers	441320	0
Furniture Stores	442110	5
Floor Covering Stores	442210	1
Window Treatment Stores	442291	2
Print and Picture Frame Stores	442292	3
All Other Home Furnishings Stores	442298	5
Appliance, Television and Other Electronics Stores	443143	25
Computer and Software Stores	443144	73

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Camera and Photographic Supplies Stores	443145	4
Audio and Video Recordings Stores	443146	1
Home Centres	444110	6
Paint and Wallpaper Stores	444120	7
Hardware Stores	444130	5
Other Building Material Dealers	444190	28
Outdoor Power Equipment Stores	444210	1
Nursery and Garden Centres	444220	17
Supermarkets and Other Grocery (except Convenience) Stores	445110	10
Convenience Stores	445120	0
Meat Markets	445210	22
Fish and Seafood Markets	445220	5
Fruit and Vegetable Markets	445230	4
Baked Goods Stores	445291	34
Confectionery and Nut Stores	445292	2
All Other Specialty Food Stores	445299	13
Beer, Wine and Liquor Stores	445310	4
Pharmacies and Drug Stores	446110	18
Cosmetics, Beauty Supplies and Perfume Stores	446120	10
Optical Goods Stores	446130	2
Food (Health) Supplement Stores	446191	8
All Other Health and Personal Care Stores	446199	15
Gasoline Stations with Convenience Stores	447110	0
Other Gasoline Stations	447190	2
Men's Clothing Stores	448110	1
Women's Clothing Stores	448120	6
Children's and Infants' Clothing Stores	448130	1
Family Clothing Stores	448140	10
Clothing Accessories Stores	448150	2
Fur Stores	448191	0
All Other Clothing Stores	448199	9
Shoe Stores	448210	3
Jewellery Stores	448310	4
Luggage and Leather Goods Stores	448320	1
Golf Equipment and Supplies Specialty Stores	451111	0
Ski Equipment and Supplies Specialty Stores	451112	0
Cycling Equipment and Supplies Specialty Stores	451113	2
All Other Sporting Goods Stores	451119	5
Hobby, Toy and Game Stores	451120	2
Sewing, Needlework and Piece Goods Stores	451130	5
Musical Instrument and Supplies Stores	451140	2
Book Stores and News Dealers	451310	3
Department Stores	452110	2
Warehouse Clubs and Superstores	452910	0
Home and Auto Supplies Stores	452991	0
All Other Miscellaneous General Merchandise Stores	452999	8
Florists	453110	2
Office Supplies and Stationery Stores	453210	1
Gift, Novelty and Souvenir Stores	453220	5
Used Merchandise Stores	453310	2
Pet and Pet Supplies Stores	453910	8
Art Dealers	453920	1
Manufactured (Mobile) Home Dealers	453930	0
Beer and Wine-Making Supplies Stores	453992	3
All Other Miscellaneous Store Retailers (except Beer and Wine-Making Supplies Stores)	453999	24
Electronic Shopping and Mail-Order Houses	454110	41
Vending Machine Operators	454210	0
Heating Oil Dealers	454311	0
Liquefied Petroleum Gas (Bottled Gas) Dealers	454312	2
Other Fuel Dealers	454319	0
Other Direct Selling Establishments	454390	5
Transportation and Warehousing		**204**
Scheduled Air Transportation	481110	1
Non-Scheduled Chartered Air Transportation	481214	5
Non-Scheduled Specialty Flying Services	481215	5
Short-Haul Freight Rail Transportation	482112	0
Mainline Freight Rail Transportation	482113	2

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Passenger Rail Transportation	482114	0
Deep Sea, Coastal and Great Lakes Water Transportation (except by Ferries)	483115	1
Deep Sea, Coastal and Great Lakes Water Transportation by Ferries	483116	0
Inland Water Transportation (except by Ferries)	483213	1
Inland Water Transportation by Ferries	483214	0
General Freight Trucking, Local	484110	6
General Freight Trucking, Long Distance, Truck-Load	484121	14
General Freight Trucking, Long Distance, Less Than Truck-Load	484122	6
Used Household and Office Goods Moving	484210	1
Bulk Liquids Trucking, Local	484221	2
Dry Bulk Materials Trucking, Local	484222	6
Forest Products Trucking, Local	484223	1
Other Specialized Freight (except Used Goods) Trucking, Local	484229	1
Bulk Liquids Trucking, Long Distance	484231	3
Dry Bulk Materials Trucking, Long Distance	484232	2
Forest Products Trucking, Long Distance	484233	1
Other Specialized Freight (except Used Goods) Trucking, Long Distance	484239	6
Urban Transit Systems	485110	3
Interurban and Rural Bus Transportation	485210	1
Taxi Service	485310	1
Limousine Service	485320	1
School and Employee Bus Transportation	485410	6
Charter Bus Industry	485510	2
Other Transit and Ground Passenger Transportation	485990	2
Pipeline Transportation of Crude Oil	486110	0
Pipeline Transportation of Natural Gas	486210	3
Pipeline Transportation of Refined Petroleum Products	486910	1
All Other Pipeline Transportation	486990	0
Scenic and Sightseeing Transportation, Land	487110	0
Scenic and Sightseeing Transportation, Water	487210	2
Scenic and Sightseeing Transportation, Other	487990	1
Air Traffic Control	488111	0
Other Airport Operations	488119	3
Other Support Activities for Air Transportation	488190	28
Support Activities for Rail Transportation	488210	6
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	2
Other Support Activities for Water Transportation	488390	6
Motor Vehicle Towing	488410	2
Other Support Activities for Road Transportation	488490	11
Marine Shipping Agencies	488511	0
Other Freight Transportation Arrangement	488519	23
Other Support Activities for Transportation	488990	7
Postal Service	491110	2
Couriers	492110	1
Local Messengers and Local Delivery	492210	2
General Warehousing and Storage	493110	8
Refrigerated Warehousing and Storage	493120	4
Farm Product Warehousing and Storage	493130	3
Other Warehousing and Storage	493190	8
Information and Cultural Industries		**1,150**
Newspaper Publishers	511110	4
Periodical Publishers	511120	11
Book Publishers	511130	10
Database and Directory Publishers	511140	7
Other Publishers	511190	3
Software Publishers (except Video Game Publishers)	511211	566
Video Game Publishers	511212	16
Motion Picture and Video Production	512110	45
Motion Picture and Video Distribution	512120	1
Motion Picture and Video Exhibition	512130	0
Post-Production and Other Motion Picture and Video Industries	512190	26
Record Production	512210	0
Integrated Record Production/Distribution	512220	0
Music Publishers	512230	3
Sound Recording Studios	512240	3
Other Sound Recording Industries	512290	1

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Radio Broadcasting	515110	1
Television Broadcasting	515120	3
Pay and Specialty Television	515210	1
Wired Telecommunications Carriers (except Cable)	517111	31
Cable and Other Program Distribution	517112	9
Wireless Telecommunications Carriers (except Satellite)	517210	25
Satellite Telecommunications	517410	9
Other Telecommunications	517910	79
Data Processing, Hosting, and Related Services	518210	140
News Syndicates	519110	7
Libraries	519121	0
Archives	519122	0
Internet Publishing and Broadcasting, and Web Search Portals	519130	135
All Other Information Services	519190	14
Finance, Insurance and Real Estate		**376**
Monetary Authorities - Central Bank	521110	0
Personal and Commercial Banking Industry	522111	7
Corporate and Institutional Banking Industry	522112	2
Local Credit Unions	522130	10
Other Depository Credit Intermediation	522190	0
Credit Card Issuing	522210	1
Sales Financing	522220	3
Consumer Lending	522291	6
All Other Non-Depository Credit Intermediation	522299	5
Mortgage and Non-mortgage Loan Brokers	522310	4
Central Credit Unions	522321	1
Other Financial Transactions Processing and Clearing House Activities	522329	14
Other Activities Related to Credit Intermediation	522390	2
Investment Banking and Securities Dealing	523110	8
Securities Brokerage	523120	5
Commodity Contracts Dealing	523130	2
Commodity Contracts Brokerage	523140	3
Securities and Commodity Exchanges	523210	1
Miscellaneous Intermediation	523910	42
Portfolio Management	523920	33
Investment Advice	523930	16
All Other Financial Investment Activities	523990	9
Direct Individual Life, Health and Medical Insurance Carriers	524111	6
Direct Group Life, Health and Medical Insurance Carriers	524112	3
Direct General Property and Casualty Insurance Carriers	524121	6
Direct, Private, Automobile Insurance Carriers	524122	0
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	1
Liability Reinsurance Carriers	524135	0
General and Other Reinsurance Carriers	524139	0
Insurance Agencies and Brokerages	524210	13
Claims Adjusters	524291	1
All Other Insurance Related Activities	524299	3
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
Securitization Vehicles	526981	0
All Other Miscellaneous Funds and Financial Vehicles	526989	4
Lessors of Residential Buildings and Dwellings (except Social Housing Projects)	531111	7
Lessors of Social Housing Projects	531112	0
Lessors of Non-Residential Buildings (except Mini-Warehouses)	531120	24

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011[p]

	NAICS Code	Performers
		number
Self-Storage Mini-Warehouses	531130	1
Lessors of Other Real Estate Property	531190	3
Real Estate Agents	531211	1
Offices of Real Estate Brokers	531212	3
Real Estate Property Managers	531310	13
Offices of Real Estate Appraisers	531320	4
Other Activities Related to Real Estate	531390	7
Passenger Car Rental	532111	2
Passenger Car Leasing	532112	2
Truck, Utility Trailer and RV (Recreational Vehicle) Rental and Leasing	532120	2
Consumer Electronics and Appliance Rental	532210	1
Formal Wear and Costume Rental	532220	0
Video Tape and Disc Rental	532230	2
Other Consumer Goods Rental	532290	6
General Rental Centres	532310	1
Construction, Transportation, Mining, and Forestry Machinery and Equipment Rental and Leasing	532410	35
Office Machinery and Equipment Rental and Leasing	532420	2
Other Commercial and Industrial Machinery and Equipment Rental and Leasing	532490	22
Lessors of Non-Financial Intangible Assets (Except Copyrighted Works)	533110	26
Architectural, Engineering and Related Services		**1,037**
Architectural Services	541310	19
Landscape Architectural Services	541320	6
Engineering Services	541330	791
Drafting Services	541340	12
Building Inspection Services	541350	10
Geophysical Surveying and Mapping Services	541360	30
Surveying and Mapping (except Geophysical) Services	541370	35
Testing Laboratories	541380	134
Computer System Design and Related		**3,173**
Computer Systems Design and Related Services (except Video Game Design and Development)	541514	3,114
Video Game Design and Development Services	541515	59
Management, Scientific and Technical Consulting		**536**
Administrative Management and General Management Consulting Services	541611	151
Human Resources Consulting Services	541612	12
Other Management Consulting Services	541619	107
Environmental Consulting Services	541620	93
Other Scientific and Technical Consulting Services	541690	173
Scientific Research and Development		**994**
Scientific Research and Development Services	5417	994
Health Care and Social Assistance		**453**
Offices of Physicians	621110	244
Offices of Dentists	621210	52
Offices of Chiropractors	621310	6
Offices of Optometrists	621320	7
Offices of Mental Health Practitioners (except Physicians)	621330	5
Offices of Physical, Occupational, and Speech Therapists and Audiologists	621340	7
Offices of All Other Health Practitioners	621390	15
Family Planning Centres	621410	7
Out-Patient Mental Health and Substance Abuse Centres	621420	3
Community Health Centres	621494	4
All Other Out-Patient Care Centres	621499	4
Medical and Diagnostic Laboratories	621510	71
Home Health Care Services	621610	7
Ambulance (except Air Ambulance) Services	621911	1
Air Ambulance Services	621912	0
All Other Ambulatory Health Care Services	621990	1
General (except Paediatric) Hospitals	622111	0
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	1
Transition Homes for Women	623991	0
Homes for Emotionally Disturbed Children	623992	0
Homes for the Physically Handicapped or Disabled	623993	1
All Other Residential Care Facilities	623999	0

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Child and Youth Services	624110	1
Services for the Elderly and Persons with Disabilities	624120	4
Other Individual and Family Services	624190	4
Community Food Services	624210	1
Community Housing Services	624220	0
Emergency and Other Relief Services	624230	1
Vocational Rehabilitation Services	624310	2
Child Day-Care Services	624410	1
All Other Services		**1,886**
Offices of Lawyers	541110	1
Offices of Notaries	541120	0
Other Legal Services	541190	11
Offices of Accountants	541212	13
Tax Preparation Services	541213	1
Bookkeeping, Payroll and Related Services	541215	19
Interior Design Services	541410	4
Industrial Design Services	541420	63
Graphic Design Services	541430	55
Other Specialized Design Services	541490	19
Advertising Agencies	541810	82
Public Relations Services	541820	3
Media Buying Agencies	541830	3
Media Representatives	541840	5
Display Advertising	541850	18
Direct Mail Advertising	541860	6
Advertising Material Distribution Services	541870	3
Specialty Advertising Distributors	541891	15
All Other Services Related to Advertising	541899	21
Marketing Research and Public Opinion Polling	541910	41
Photographic Services	541920	13
Translation and Interpretation Services	541930	4
Veterinary Services	541940	12
All Other Professional, Scientific and Technical Services	541990	97
Holding Companies	551113	238
Head Offices	551114	5
Office Administrative Services	561110	115
Facilities Support Services	561210	0
Employment Placement Agencies and Exectutive Search Services	561310	12
Temporary Help Services	561320	15
Employee Leasing Services	561330	0
Document Preparation Services	561410	4
Telephone Call Centres	561420	13
Business Service Centres	561430	18
Collection Agencies	561440	5
Credit Bureaus	561450	2
Other Business Support Services	561490	14
Travel Agencies	561510	8
Tour Operators	561520	7
Other Travel Arrangement and Reservation Services	561590	5
Investigation Services	561611	4
Security Guard and Patrol Services	561612	4
Armoured Car Services	561613	0
Security Systems Services (except Locksmiths)	561621	43
Locksmiths	561622	1
Exterminating and Pest Control Services	561710	6
Window Cleaning Services	561721	0
Janitorial Services (except Window Cleaning)	561722	14
Landscaping Services	561730	31
Carpet and Upholstery Cleaning Services	561740	2
Duct and Chimney Cleaning Services	561791	3
All Other Services to Buildings and Dwellings	561799	7
Packaging and Labelling Services	561910	21
Convention and Trade Show Organizers	561920	11
All Other Support Services	561990	73
Elementary and Secondary Schools	611110	0
Community Colleges and C.E.G.E.P.s	611210	4
Universities	611310	0
Business and Secretarial Schools	611410	0
Computer Training	611420	9
Professional and Management Development Training	611430	13

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Technical and Trade Schools	611510	8
Fine Arts Schools	611610	0
Athletic Instruction	611620	3
Language Schools	611630	1
All Other Schools and Instruction	611690	16
Educational Support Services	611710	9
Theatre (except Musical) Companies	711111	0
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	0
Horse Race Tracks	711213	0
Other Spectator Sports	711218	3
Live Theatres and Other Performing Arts Presenters with Facilities	711311	0
Sports Stadiums and Other Presenters with Facilities	711319	0
Performing Arts Promoters (Presenters) without Facilities	711321	3
Festivals without Facilities	711322	0
Sports Presenters and Other Presenters without Facilities	711329	3
Agents and Managers for Artists, Athletes, Entertainers and Other Public Figures	711410	0
Independent Artists, Visual Arts	711511	4
Independent Actors, Comedians and Performers	711512	2
Independent Writers and Authors	711513	2
Non-Commercial Art Museums and Galleries	712111	1
History and Science Museums	712115	0
Other Museums	712119	0
Historic and Heritage Sites	712120	0
Zoos and Botanical Gardens	712130	1
Nature Parks and Other Similar Institutions	712190	0
Amusement and Theme Parks	713110	0
Amusement Arcades	713120	0
Casinos (except Casino Hotels)	713210	0
Lotteries	713291	1
All Other Gambling Industries	713299	3
Golf Courses and Country Clubs	713910	3
Skiing Facilities	713920	1
Marinas	713930	0
Fitness and Recreational Sports Centres	713940	6
Bowling Centres	713950	0
All Other Amusement and Recreation Industries	713990	7
Hotels	721111	1
Motor Hotels	721112	0
Resorts	721113	1
Motels	721114	0
Casino Hotels	721120	0
Bed and Breakfast	721191	1
Housekeeping Cottages and Cabins	721192	0
All Other Traveller Accommodation	721198	2
RV (Recreational Vehicle) Parks and Campgrounds	721211	0
Hunting and Fishing Camps	721212	1
Recreational (except Hunting and Fishing) and Vacation Camps	721213	0
Rooming and Boarding Houses	721310	1
Full-Service Restaurants	722511	35
Limited-Service Eating Places	722512	31
Food Service Contractors	722310	4
Caterers	722320	18
Mobile Food Services	722330	1
Drinking Places (Alcoholic Beverages)	722410	5
General Automotive Repair	811111	26
Automotive Exhaust System Repair	811112	3
Other Automotive Mechanical and Electrical Repair and Maintenance	811119	14
Automotive Body, Paint and Interior Repair and Maintenance	811121	26
Automotive Glass Replacement Shops	811122	4
Car Washes	811192	1
All Other Automotive Repair and Maintenance	811199	0
Electronic and Precision Equipment Repair and Maintenance	811210	57
Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	811310	244
Home and Garden Equipment Repair and Maintenance	811411	11
Appliance Repair and Maintenance	811412	4
Reupholstery and Furniture Repair	811420	8

Table 14-4 – continued

Research and development performers — By the North American Industry Classification System (NAICS) 2012, in 2011p

	NAICS Code	Performers
		number
Footwear and Leather Goods Repair	811430	0
Other Personal and Household Goods Repair and Maintenance	811490	22
Barber Shops	812114	0
Beauty Salons	812115	4
Unisex Hair Salons	812116	1
Other Personal Care Services	812190	16
Funeral Homes	812210	1
Cemeteries and Crematoria	812220	0
Coin-Operated Laundries and Dry Cleaners	812310	0
Dry Cleaning and Laundry Services (except Coin-Operated)	812320	5
Linen and Uniform Supply	812330	2
Pet Care (except Veterinary) Services	812910	2
Photo Finishing Laboratories (except One-Hour)	812921	6
One-Hour Photo Finishing	812922	0
Parking Lots and Garages	812930	1
All Other Personal Services	812990	10
Religious Organizations	813110	0
Grant-Making and Giving Services	813210	1
Social Advocacy Organizations	813310	3
Civic and Social Organizations	813410	4
Business Associations	813910	8
Professional Organizations	813920	5
Labour Organizations	813930	0
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	0
Other Federal Government Public Administration	911910	1
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
Other Municipal Protective Services	913190	0
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 15

Business enterprises with one or more employees, by industry, with percentage change from 2007 to 2011 and percentage distribution, 2011[p]

	2007	2008	2009	2010[r]	2011[p]	Change from 2007 to 2011	2011 distribution
	number					percent	
Total all industries	**974,910**	**985,283**	**998,810**	**999,693**	**997,622**	**2.3**	**100.0**
Agriculture, forestry, fishing and hunting	**49,119**	**49,270**	**49,642**	**49,727**	**50,620**	**3.1**	**5.1**
Agriculture	35,201	35,935	36,789	37,339	38,459	9.3	3.9
Forestry and logging	8,410	7,881	7,449	7,036	6,867	-18.3	0.7
Fishing, hunting and trapping	5,508	5,454	5,404	5,352	5,294	-3.9	0.5
Mining and oil and gas extraction	**8,326**	**8,418**	**8,671**	**8,282**	**7,883**	**-5.3**	**0.8**
Oil and gas extraction	6,684	6,755	6,879	6,500	5,998	-10.3	0.6
Mining	1,642	1,663	1,792	1,782	1,885	14.8	0.2
Utilities	**3,485**	**3,220**	**3,274**	**3,283**	**3,389**	**-2.8**	**0.3**
Electric power	469	323	321	306	320	-31.8	0.0
Other utilities	3,016	2,897	2,953	2,977	3,069	1.8	0.3
Construction	**116,165**	**120,539**	**123,242**	**124,773**	**125,641**	**8.2**	**12.6**
Manufacturing	**52,553**	**51,483**	**50,755**	**49,202**	**48,235**	**-8.2**	**4.8**
Food	5,226	5,083	4,987	4,856	4,788	-8.4	0.5
Beverage and tobacco	618	627	660	652	655	6.0	0.1
Textile	1,410	1,355	1,284	1,217	1,184	-16.0	0.1
Wood products	3,675	3,582	3,468	3,376	3,272	-11.0	0.3
Paper	588	555	545	509	501	-14.8	0.1
Printing	4,357	4,233	4,202	4,062	3,938	-9.6	0.4
Petroleum and coal products	153	139	129	136	129	-15.7	0.0
Pharmaceutical and medicine	265	261	266	261	263	-0.8	0.0
Other chemicals	1,487	1,439	1,454	1,447	1,407	-5.4	0.1
Plastic products	1,739	1,711	1,724	1,662	1,640	-5.7	0.2
Rubber products	275	265	266	252	246	-10.5	0.0
Non-metallic mineral products	1,870	1,837	1,818	1,764	1,724	-7.8	0.2
Primary metal (ferrous)	325	293	319	318	248	-23.7	0.0
Primary metal (non-ferrous)	278	265	247	252	257	-7.6	0.0
Fabricated metal products	7,907	7,893	7,824	7,581	7,500	-5.1	0.8
Machinery	5,041	4,963	4,853	4,664	4,634	-8.1	0.5
Computer and peripheral equipment	247	246	244	224	216	-12.6	0.0
Communications equipment	283	274	291	278	269	-4.9	0.0
Semiconductor and other electronic components	422	396	399	387	384	-9.0	0.0
Navigational, measuring, medical and control instruments	750	727	717	689	679	-9.5	0.1
Other computer and electronic products	187	179	186	179	175	-6.4	0.0
Electrical equipment, appliance and components	1,073	1,049	1,034	1,015	984	-8.3	0.1
Motor vehicle and parts	1,295	1,263	1,234	1,178	1,132	-12.6	0.1
Aerospace products and parts	233	223	227	212	214	-8.2	0.0
All other transportation equipment	558	520	515	491	476	-14.7	0.0
Furniture and related products	4,268	4,289	4,237	4,139	4,106	-3.8	0.4
Other manufacturing industries	8,023	7,816	7,625	7,401	7,214	-10.1	0.7
Services	**745,262**	**752,353**	**763,226**	**764,426**	**761,854**	**2.2**	**76.4**
Wholesale trade	51,184	50,731	50,449	48,924	48,354	-5.5	4.8
Retail trade	104,288	104,281	102,161	100,942	100,265	-3.9	10.1
Transportation and warehousing	43,666	45,396	46,400	46,054	46,531	6.6	4.7
Information and cultural industries	10,934	10,781	10,934	10,998	11,191	2.4	1.1
Finance, insurance and real estate	62,436	63,200	64,170	66,591	68,216	9.3	6.8
Architectural, engineering and related services	17,643	17,664	17,839	17,479	17,613	-0.2	1.8
Computer system design and related services	21,865	23,154	24,312	24,583	25,292	15.7	2.5
Management, scientific and technical consulting services	24,258	24,471	25,305	25,193	25,306	4.3	2.5
Scientific research and development services	2,403	2,432	2,468	2,447	2,425	0.9	0.2
Health care and social assistance	81,031	81,599	83,246	85,545	85,756	5.8	8.6
All other services	325,554	328,644	335,942	335,670	330,905	1.6	33.2

Note(s): Components may not add to totals due to rounding.
Source(s): Statistics Canada, Business Register, enterprises with one or more employees, December 2007-2011.

Survey methodology

The 2014 industrial R&D intentions survey

The 2012 Research and Development in Canadian Industry (RDCI) survey collected data for four years to provide estimates of final research and development (R&D) expenditures for 2011, actual R&D expenditures for 2012, planned R&D expenditures for 2013 and R&D spending intentions for 2014. The 2012 RDCI questionnaire was sent in September 2013 and collection closed in January 2014. The RDCI survey mail-out included the supplement survey, Energy Research and Development Expenditures by Area of Technology, 2012.

Population and sample

The survey population comprised:

- all firms that had reported R&D expenditures in 2009, 2010, or 2011 reference year surveys;
- firms with an approved claim for a federal R&D income tax incentive for 2009, 2010, 2011 or 2012;
- firms that were identified by respondents in surveys of government science and technology activities as R&D contractors or grantees for 2012 to 2013;
- firms that were reported by other firms as funding or performing R&D in the prior collection cycle; and
- firms identified as funding or performing R&D in 2012 or 2013 through newspaper, journal articles or publicly available directories.

The population of R&D performers and funders comprising 20,203 enterprises in 2012 was then stratified into a frame composed of 55 industry groups that covered the entire business sector. Industrial non-profit associations and business joint ventures are included in the business enterprise sector. Entities in the household, government, higher education and private non-profit sectors are excluded.

Text table 1
RDCI frame and sample

	Enterprises
Frame	17,521
Available for sampling	10,899
Take none (smallest)	6,622
Available for sampling	**10,899**
Not selected	8,927
Sample	1,972
Must take	456
Take all (large)	642
Take some (medium)	462
Take some (small)	412

For reference year 2012, higher thresholds of R&D spending were applied to reduce the numbers of firms reporting R&D only in prior years, but not the reference year. This was done to reduce the number of respondents surveyed who no longer perform or fund R&D (i.e. out of scope).

Sample for reference year 2012

A sample of 1,972 enterprises, which was converted into 2,023 responding units, was selected from the frame consisting of the following groups:

1. A "must take" stratum consisting of special entities such as industrial non-profit organizations, technology purchasers or vendors, and known R&D performers that do not file scientific research and experimental development (SR&ED) tax incentive applications. These special entities were all selected to be included in the sample because there are no other sources of data available for them. Industrial non-profit organizations are not eligible for tax incentives while some commercial firms opt not to make a claim.

2. The "take all" stratum comprises the largest R&D performers in each of the industrial groups. These large R&D performers represented about two-thirds of R&D expenditures in each of the specified industry groups for the previous reference year. All units in this stratum were included in the sample.

3. The "take some" stratum is composed of mid-size R&D performers in each of the specified industry groups. A sample of units from this stratum was included in the sample.

4. A coverage study stratum containing 50 firms with R&D expenditures reported to Statistics Canada in other surveys with questions related to R&D (Functional Foods and Natural Health Products Survey, Canadian Commercial Aerospace, Defence, Commercial and Civil Marine and Industrial Security Sector Survey and Survey of Intellectual Property Management), but not otherwise part of RDCI frame, was added to the sample. Units that were in scope contributed to the estimate and will be included in the survey frame for future collection cycles.

5. A "take none" stratum comprised of the smallest R&D performers, those firms whose total R&D expenditures comprised the bottom 5% of all R&D expenditures in each industrial group, was created to reduce response burden. Firms in the "take none" stratum were excluded from the sample.

Of the 2,023 units sampled, there were 46 industrial non-profit organizations.

Collection

Collection in reference year 2012 continued the use of two features introduced in 2010. Firstly, a failed-edit follow-up platform enabled follow-up for records that had missing or inconsistent data. Secondly, respondents were given the option of completing internet-based electronic questionnaires. These questionnaires contained some interactive edits, but all of these records received the same treatment as the data received through paper questionnaires.

Survey response

For reference year 2012 the RDCI survey response rate was 79%, (respondents / (total survey population – out-of-scope respondents)). These units accounted for 69% of the overall estimate. For the industrial non-profit component of the sample the response rate was 81% with the responding units accounting for 93% of the overall estimate.

Following data collection, survey responses are processed for tabulation and data analysis.

Processing

The RDCI database is comprised of two sources of data: questionnaire data and administrative data from Canada Revenue Agency (CRA). These administrative data consist of approved Scientific Research and Experimental Development (SR&ED) tax claims, which are also known as "T661" or "Schedule 32" claims. The SR&ED tax data are received for unique Business Numbers (BNs). The questionnaires are also collected at the same level. The Business Register, a list of all known active businesses in Canada, provides a link between these BNs and the establishments, companies and enterprises to which they relate.

Where data are available from both questionnaires and SR&ED tax records for a given company (BN) the questionnaire data are used. This is because firms need not disclose all R&D expenditures in their T661 application. They may choose to report only selected R&D projects. There are also certain capital expenditures (land and buildings for R&D) which are included in the survey questionnaire, but are excluded from the SR&ED tax incentive program. Generally, the values reported through the survey response should be greater than or equal to the SR&ED tax data. Conceptually, there should be no cases where the reverse occurs.

Data from the RDCI questionnaires, the SR&ED tax data and the Energy Research and Development Expenditures by Area of Technology questionnaires were reviewed for consistency and completeness. The data editing process is presented according to sequence of activities followed.

Pre-grooming of data

In the pre-grooming stage of processing, edit checks are performed to identify missing and invalid entries that would point to data records that are in error. Extreme errors resulting from processing were identified in the tax and questionnaire data. An example of an error in the tax data is an extremely high R&D expenditure value that could be the result of data capture error. Very few such errors were identified. Any record identified was corrected manually.

Missing classification information (completeness)

For the 2012 survey cycle, over one thousand SR&ED approved tax records were not classified to a North American Industry Classification System (NAICS) group. These records were manually assigned a NAICS code.

All RDCI and Energy R&D records were verified to ensure they had a postal code in order to assign them to a province.

Data editing

Editing is a process to ensure that survey data are acceptable, complete, consistent and correct. There are three main categories of edits: validity, consistency and distribution edits. Validity and consistency edits are done one record or questionnaire at a time. However, distribution edits are performed by looking at data across questionnaires.

Validity edits

Validity edits identify incoherence in the data. Examples of validity edits include:

- Respondents reporting intramural R&D performance with no R&D personnel;
- Wages and salaries for R&D which are greater than the firm’s total wages and salaries;
- Units of measure issues (U.S. vs. Canadian dollars, dollars vs. thousands of dollars)

Consistency edits

Consistency edits verify the relationships between questions. Consistency edits may also be applied to the logical flow of the questionnaire, or may involve the use of administrative data or historical data. These types of edits typically verify relationship between questions.

For the RDCI, some examples of consistency edits are:

- Wages and salaries and other current costs on R&D performed should equal total current costs;
- Total current costs at Canada level should equal the total current expenditures reported for provinces and territories;
- Total R&D expenditures reported for Canada should equal the total sources of funds for R&D performed;
- Total R&D expenditures should match the total for all fields of science or technology;
- Total R&D personnel should likewise be the same across all questions.

Distribution edits

A question on the RDCI allows for the distribution of values for expenditures and personnel across provinces, while another new question allocates expenditures and personnel across science types. Expenditures are also allocated across sources of funding. These distribution questions are edited to identify outliers which are then validated.

Imputation methods employed in RDCI survey

It is not usually possible to resolve all records in error during the pre-grooming stage. Imputation replaces items that fail the edit rules to fix partial non-response or total non-response.

Imputation for RDCI uses the following data sequence:

- Actual respondent estimates from the prior year for planned expenditures;
- SR&ED tax data;
- Random ratio donors anchored to historical data.

Deterministic imputation

Deterministic imputation is done as part of the editing process. It is generally specified as action items to be performed using logic decision tables. In deterministic imputation only one value is deemed possible. Deterministic imputation is generally of the form A+B=C. An example would be: total professionals + total technical and administrative staff = total R&D personnel.

Imputation by substitution

Imputation by substitution involves the use of an external data source. An auxiliary data source such as historical data or administrative data is used for missing data. For the RDCI, COA4 (explained below) and PD7 (explained below) files were used to impute revenues and employment data. The approved T661 (Scientific Research and Experimental Development) tax incentive claims were used as an alternate data source that was treated as respondent data.

For SR&ED tax filers, revenue figures were adjusted to reflect corporate income tax data for the corresponding filer. The tax data are from T2 corporate income tax files which are mapped to the *Statistics Canada's Chart of Accounts (COA)* classification by firm. The variable COA4 relating to (Total) Revenues of a firm was used to improve data quality for missing or inconsistent total revenues.

The Payroll Deductions total employment data (PD7) file was also used to improve the quality of missing or inconsistent total employment data. Payroll Deduction data are monthly data, and therefore, an annual average was calculated from the Canada Revenue Agency (CRA) monthly Payroll Deduction file for all firms that reported having one or more employees in at least one of the twelve months of the tax year.

Imputation method based on estimators

Imputation method based on estimators generally refers to the use of ratios based on historical data or other variables on the questionnaire. To estimate R&D expenditures two years past the base year, editing rules were applied using donor ratios and a response was imputed based on the response of a similar firm in the same industry group. Data are modeled using mathematical formulae.

Donor records for imputation were determined by imputation class, which were defined by population subgroups, NAICS group and size. Size was determined by total R&D expenditure (total intramural and extramural expenditures) which was used to group enterprises. For the RDCI survey, the following imputation methods were employed: deterministic imputation, substitution, and use of estimators.

For example, a firm reported $1 million for total intramural R&D expenditures for the reference year (RY) and did not report expenditures for RY+1 and RY+2. To impute for RY+1 and RY+2 periods, a donor is found within the industry group and size category. If the donor reported a 5% increase in the first year and no change from that estimate in the second year, the missing record would be imputed the following values:

RY	1,000,000 anchor
RY+1	1,050,000 imputed value
RY+2	1,000,000 imputed value

Limits on the expenditure ratio from the donor are applied such that the maximum shift between RY and RY+1 and RY and RY+2 does not exceed 20%.

Also, during the data processing stage, there is a need to create projected records to account for tax data which have not been received to date. 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, approved and the final approved claims are forwarded to Statistics Canada. As a result, data may not arrive for up to two years after the expenditures were incurred and occasionally longer. To address the situation, the imputation system projects existing records forward in time. As the actual administrative data arrive, these imputed records are removed from the database and replaced with the actual tax data. This imputation system confirms the firm is active using Statistics Canada's Business Register, and then applies an imputation based on industry trends. Since the imputation does not seriously influence overall trends, the R&D data are published as soon as possible after the survey is conducted, and are subject to minor revisions in subsequent publications.

The SR&ED tax data records do not have all of the detail that is found on the questionnaire. For certain portions of the questionnaire, the detail for the tax records is imputed. This is principally in the regard to planned and forecast expenditures, the level of education of the R&D personnel and the provincial distribution of R&D expenditures. For the expenditures and personnel imputation, ratios from respondents are applied to anchor variables that are available from the SR&ED tax data to impute detail. For provincial distribution, information about the structure of the enterprise is obtained from the Business Register. For simple records, the expenditures are assigned to the province from which the claim was filed. For more complex enterprises, the current R&D expenditures and personnel are allocated based on the ratios of revenues by province within the enterprise's establishments across Canada. Capital R&D expenditures are allocated to the province with the largest amount of current expenditures.

Data verification

Following the completion of the edit and imputation process, data are verified and are compared against previous years' estimates.

A general verification of components to totals and totals across the RDCI questionnaire is conducted as a first step after imputation. Values are confirmed to add up correctly and to confirm that the classification variables (NAICS, employment and revenue) exist for each record and are found reasonable, a review of the R&D micro data follows.

For the Reference Year (RY), an industry by province table is compared to the results with the published data from the previous years. Extra scrutiny is paid to the largest contributors.

For RY+1 and RY+2, patterns in the imputation of the SR&ED tax records and incomplete questionnaires are reviewed.

At this stage, verification of data is to examine and understand the underlying data and to be able to account for changes. Records are again verified for the main R&D variables by industry group and by province. The largest records for each province and industry group are reviewed to understand what underlies changes to the estimates.

Sources of errors

Coverage

Coverage errors consist of omissions, erroneous inclusions, and duplication in the frame used to conduct the survey. Survey questionnaires were sent to all known large R&D performing and/or funding firms i.e., those believed to have the largest R&D expenditures within their industry group. If a firm has never responded to the survey and does not apply for T661 tax credits, it can only be identified for the survey by mention in the media or through reporting as a recipient or source of funds from an R&D survey for other sectors (examples: government, private non-profit). Firms are added to the frame based on such a review of other sources.

Administrative data are used for the remaining R&D performing or funding firms which are not included in the questionnaire coverage. Firms have up to 18 months after their fiscal year end to file a Scientific Research & Experimental Development tax incentive program claim for their R&D expenditures.

Errors in classification, notably industrial and geographical, are also possible and would have coverage impacts within their specified categories.

Non-response

Non-response errors occur when there is no response to one or all of the survey questions. Non-response leads to an increase in variance as a result of a reduction in the actual size of the sample. Imputing for non-response may produce a bias if the non-respondents have characteristics of interest that are different from those of the respondents.

Non-response is a concern in a couple of areas. One is the estimate of R&D expenditures two years past the base year (planned and forecast R&D expenditures). Non-response is an issue for this question as some firms are hesitant to estimate likely expenditures. 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. Mitigation of non-response for this question consists of specific training of data collection staff to understand the importance of these data and to be able to explain their importance to respondents.

The second issue involves the use of SR&ED tax data for the remaining R&D performers. These data represent approximately one-third of all R&D performed by businesses by value. The SR&ED tax records do not contain as much information as those from the questionnaire. The data not contained on the tax form are imputed based the respondent data from questionnaires, based on the imputation criteria specified previously.

Non-response is generally addressed through imputation. Automatic imputations are made for the SR&ED tax data population as well as for non-response and invalid response within the questionnaire portion of the sampled population.

Response errors

Response errors occur when the response provided differs from the real value; such errors may be attributable to the respondent, the interviewer, the questionnaire, the collection method or the respondent's record-keeping system.

Processing and data capture

Processing errors occur at subsequent stages of the process, when checking, coding, entering, imputing, and tabulating data.

Processing errors are monitored and controlled using quality control techniques. Detailed examination is performed on numerous tables and listings as part of data validation and analysis before publication tables are created.

Sampling

Sampling errors occur when the sample is not representative of the population. As the RDCI is a census there are no sampling errors.

Comparisons with other data sources

Discrepancies between federal government reporting of funds to industry (the business enterprise sector) for R&D and industry's reporting of such funds may exist as a result of different interpretations of the character of R&D. 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. It may even be reported in a different fiscal period. This activity may not be reported at all 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 may not agree with those reported in *Federal Science Activities, 2012/2013, (Catalogue no. 88-204-X*).

Industrial Classification

The RDCI survey is designed to reflect respondents as they are classified on the Business Register and the structure of the firm as it reports its R&D activities (including reporting R&D expenditures for the SR&ED tax incentive program). As a result, a firm can only be assigned to one industry although that firm may be engaged in activities in several industries. The assignment is based on the activity from which the firm derived the greatest portion of its value added.

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 domestic operations, and for which consolidated financial and balance sheet accounts are maintained. (*Enterprise*)

The unit of measure for most economic production surveys is the establishment. In the case of the RDCI, the unit of measure is the enterprise, which may include a number of establishments. Differences in the unit of measure, therefore, may make comparison between the RDCI and economic production surveys difficult.

The economic importance of activities undertaken by enterprises can vary from year to year due to changes in market conditions, for instance, in the relative importance of wholesaling, manufacturing and scientific research and development services undertaken by the enterprise. 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 can shift between natural resources and manufacturing industries.

Those 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).

Industrial R&D personnel estimates

There are two sources of data for the industrial R&D personnel estimates: questionnaire estimates for firms covered by the Research and Development in Canadian Industry (RDCI) survey; and administrative data taken from final approved Scientific Research and Experimental Development (SR&ED) tax incentive program claims. Where data are available from both sources, respondent data from the questionnaire are used.

Users are advised that there are differences in the data collected from the two sources of industrial R&D personnel data. The two most important differences are outlined below.

First, the SR&ED tax incentive program claims for R&D personnel are not revised through the review cycle of the claims. Therefore, the final approved claims, which may have had projects denied, will contain the estimated number of R&D personnel from the original claim. Statistics Canada performs data coherence exercises on the supplied SR&ED R&D personnel data using relationships between wages and salaries to estimated number of R&D personnel, reviewing other current costs combined with wages and salaries to estimated number of R&D personnel and relationship of number of R&D personnel to total employment of the claimant.

Second, the SR&ED tax incentive program claims do not collect R&D personnel by level of education. Therefore, for the total universe data are imputed based upon response to the RDCI survey. The data quality for imputation of industrial R&D personnel by level of education for all industries is acceptable. Users are cautioned that industrial R&D personnel data by level of education, by industrial detail, and/or by provincial distribution are subject to suppression for quality reasons.

Estimates

Quality indicators are provided based on the impact of imputation on the estimate. These indicators are as follows:

Text table 2
Quality indicators

Symbol	Meaning	Coefficient of variation
A	Excellent	0 to 4.9%
B	Very good	5.0% to 9.9%
C	Good	10.0% to 14.9%
D	Acceptable	15.0% to 24.9%
E	Use with caution	25.0% to 34.9%
F	Too unreliable to be published	> 35.0%

Confidentiality programs are also applied to ensure that the release of data conforms to Statistics Canada policy on confidentiality.

Technical notes

Data availability

Data for the reference year 2012 are available for all tables with the exception of counts of firms.

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 firms.

Regional data on research and development (R&D) expenditures and personnel are only available for 1977, 1979 and 1981 to 2012.

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 from 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 from 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 corporation 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 corporation, 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 full-time equivalent person-years, it is necessary to estimate the full-time equivalent of these persons working only part-time in R&D.

Professional personnel: are researchers or R&D managers. They can be either scientists or engineers. Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned. Managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work also fall into this category.

Scientists and engineers: Are professionally trained to conduct investigations or enquiries to acquire a theoretical, abstract or practical knowledge of physical and natural phenomena, improve or develop concepts, theories and operational methods, or apply scientific and technological knowledge relating to fields such as physics, astronomy, meteorology, chemistry, geophysics, geology, mathematics, statistics, computing, architecture, engineering and technology.

Senior administrators and managers: Managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work also fall into this category.

Technical and administrative support personnel: Technicians and equivalent staff are persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences. Other supporting staff includes skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects. Both technical and administrative support personnel work to directly support the activities of researchers.

Technicians and technologists: Technically trained personnel who assist scientists and engineers in R&D, e.g. chemical technicians, draftspersons. They may be certified by either provincial educational authorities or by provincial or national scientific or engineering associations.

Other administrative support: Personnel directly engaged in the R&D program, e.g. machinists and electricians in construction of prototypes, or clerks, typists, accountants and storekeepers engaged in the administration or clerical support of R&D firms.

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 four scientists engaged in R&D work, one works solely on R&D projects and the remaining three devote only one quarter of their working time to R&D, then: FTE = 1 + 1/4 + 1/4 + 1/4 = 1.75 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 firms with activities in more than one industry (e.g., firms which both refine petroleum and extract oil). Another is caused by the concentration of the R&D activity among a few firms. 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 firms chosen only for their involvement in R&D.

There are some restrictions on the application of the NAICS, for example, large R&D performing firms that are classified as "holding companies" are assigned to the principle industrial activity of the firm.

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

Research and development (R&D) is systematic investigation carried out in the natural sciences and engineering 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 systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems or services, or to improving substantially those already produced or installed.

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 2012 by Industry group

Text table 1
North American industry classification system (NAICS) 2012 by Industry group

	NAICS code
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, 311340, 311351, 311352, 311410, 311420, 311511, 311515, 311520, 311611, 311614, 311615, 311710, 311811, 311814, 311821, 311824, 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, 333245, 333246, 333247, 333248, 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, 315220, 315241, 315249, 315281, 315289, 315990, 316110, 316210, 316990, 339110, 339910, 339920, 339930, 339940, 339950, 339990

Text table 1 – continued

North American industry classification system (NAICS) 2012 by Industry group

	NAICS code
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, 443143, 443144, 443145, 443146, 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, 451111, 451112, 451113, 451119, 451120, 451130, 451140, 451310, 452110, 452910, 452991, 452999, 453110, 453210, 453220, 453310, 453910, 453920, 453930, 453992, 453999, 454110, 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, 511211, 511212, 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	541514, 541515
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, 722310, 722320, 722330, 722410, 722511, 722512, 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