Catalogue no. 18-001-X
ISBN 978-0-660-71650-3

Reports on Special Business Projects

Direct and Indirect Support for Innovation in Canada

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Release date: May 17, 2024

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Acknowledgments

We would like to acknowledge the attentive comments provided by two anonymous reviewers.

Direct and Indirect Support for Innovation in Canada

by **Rashid Nikzad** and **Francis Demers**

1 Introduction

Economic theory suggests that, because of the difficulty for private firms to appropriate all innovation benefits and because of liquidity constraints, the private sector invests less in research and development (R&D) than is socially desirable (Hall and Van Reenen, 2000; Organisation for Economic Co-operation and Development [OECD], 2020). Governments correct this market failure by providing incentives to private firms to compensate for the gap between the private and social returns to R&D expenditures and to alleviate firms' financial constraints. The main tools governments use to achieve these objectives include direct instruments such as R&D grants and contributions, indirect instruments such as R&D tax credits, or a mixture of the two.

According to the economic literature, the main drivers of economic growth are the increase in labour force, investment in machinery and equipment, and increase in productivity. Research suggests that productivity growth has become the main source of economic growth in developed countries because of the aging population and diminishing returns to capital, and that innovation is the main contributor to productivity growth (Lynch and Sheikh, 2011; Science, Technology and Innovation Council, 2012; OECD, 2023). Because of the importance of R&D and innovation for the Canadian economy, the federal government has taken several measures to improve the R&D activity of the business sector with the objective of boosting innovation and productivity. This effort includes finding the right balance between direct and indirect R&D support instruments to increase innovation and economic growth.

This study compares the Government of Canada's direct and indirect measures to support R&D, as captured by business innovation and growth support (BIGS) programs and the Scientific Research and Experimental Development (SR&ED) tax incentive program. BIGS and SR&ED are two central instruments that the Canadian government uses to stimulate R&D expenditures in the business sector. Section 2 provides a background on direct and indirect tools that encourage R&D expenditures. Section 3 introduces the Government of Canada's direct and indirect supports, as represented by BIGS and SR&ED. Section 4 compares these two tools in terms of volume, target groups and the relationship with R&D expenditures. Section 5 concludes.

2 Government tools to support innovation

Government intervention in R&D can be via supply-push instruments, that aim at increasing the supply of innovation activities, and demand-pull instruments, that attempt to increase the demand for innovation (Criscuolo et al., 2022). Supply-push instruments have been the main tools used by governments to support business innovation, and they are grouped into direct or indirect instruments. Direct instruments to support R&D include tools such as grants and loans. Indirect instruments include R&D tax credits, R&D allowances and reductions in R&D workers' wage taxes (Science, Technology and Innovation Council, 2011). The main difference between the two instruments is that tax incentives usually allow private firms to choose projects, while in the case of direct subsidies, the government usually determines the project, either because it spends the funds directly on the project or because the funds are distributed via grants to the firms for specific research objectives. Government procurement can be used as a tool to encourage economic activities by increasing demand. In R&D support through procurement, the government increases the demand for innovation activities by contracting out research projects to the private and public sectors. Government R&D contracts are usually used to help government departments better define and fulfill their mandates. For example, a large portion of R&D in the aerospace and defence industries is carried out this way. The main difference between contracts and grants is that grants are usually competitive financial awards that do not carry any future public commitment to purchase (David et al., 2000). Governments may also directly engage in R&D activities through their research labs. Examples include the National Research Council Canada and the National Science Foundation in the United States.

The choice of R&D support instrument is an important point in the innovation system. The best balance of tools varies from country to country and is determined by the type of market failure being addressed, the type of R&D that the government wants to stimulate and the government's public policy objectives. The advantages and

disadvantages of direct and indirect support have been discussed in the literature (Hall and Van Reenen, 2000; David et al., 2000; Bérubé and Mohnen, 2009; Czarnitzki et al., 2011; OECD, 2020; OECD 2022); they can be summarized as follows.

a. Advantages of direct support
   - It can directly correct market failures because it can target specific externalities, asymmetric information or public good problems associated with innovation.
   - It can focus on specific barriers to innovation. Examples of barriers include undersupply of private investment in R&D, the failure of market actors to supply public goods, gaps in the market for early-stage equity finance, and difficulties faced by some small and medium-sized enterprises (SMEs) in accessing public procurement markets.
   - It offers more flexibility to target projects with higher social rates of return. This means that, at least in theory, such funding could be concentrated in areas where there is a large gap between social and private rates of return.
   - More direct support can be provided to individual firms for specific R&D projects, and it can focus on activities and actors that make the greatest contribution to meeting public policy goals, e.g., environmental improvement.
   - The effects of direct support can be measured better than those from indirect support for the specific intervention.

b. Disadvantages of direct support
   - Direct support may replace some or all of the R&D that the performing firms would otherwise have been ready to undertake (R&D crowding out).
   - Direct support may affect private sector investments negatively in the same technological areas because the expected rates of return to investment by firms that do not receive the support tend to be lower than the rates of those that receive the support. In other words, direct support could leave the receiving companies well positioned to enter the final product market with significant first-mover advantages.
   - It may displace private real R&D investment by increasing the price of R&D inputs, particularly increasing researchers' salaries.
   - The administration of direct support by the government could pose problems related to:
     - information asymmetries between the innovator and government because the government agency that provides the funds does not necessarily have enough information to assess the merits of the research project;
     - the moral hazard on the part of the inventor or the innovating firm, as the firm may change its activities after receiving the funds;
     - costly bureaucratic procedures;
     - bureaucratic objectives;
     - political pressure on the government agency that administers R&D grants to fund specific projects to support certain stakeholders;
     - lack of expertise in the allocation of the support.
   - There is the possibility that the politics of innovation policy would put pressure on the government agency to fund projects with a high private return, to ensure the appearance of a successful public R&D policy (picking the winner).

The various elements mentioned above could affect the impact of direct support in eliminating the gap between the social and private returns to R&D.

c. Advantages of indirect support
   - Tax credits are generally neutral in terms of R&D support, in the sense that all firms that perform eligible R&D can claim their expenditures, irrespective of the industry, firm size and objective of the innovation activity.
   - Tax credit administration is easier to set up and maintain than direct support.
   - R&D tax credit administration does not involve arbitrary decisions regarding the distribution of R&D support among sectors, regions, industries or firms.
   - Indirect support does not interfere in firms' R&D strategies and lets market mechanisms determine R&D priorities.
   - Evidence suggests that the effects of tax incentives are less likely to be absorbed into higher wages and hence displace R&D expenditures.
   - Indirect support may be more accessible than direct support by being equally available to SMEs, as well as large firms.

d. Disadvantages of R&D support
   - Although R&D tax credits stimulate overall R&D activity, they do not address the sources of market failures in innovation activities.
   - It affects the composition of R&D, favouring activities that promise the largest short-term profit.
   - Consequently, projects with high potential social rates of return, basic research and research infrastructure may be less stimulated by tax credits.
   - The two latter issues could lead to rather weaker spillover benefits to other firms and industries.

As illustrated above, both direct and indirect instruments to support R&D have advantages and disadvantages. A review of the existing literature suggests that it is not easily possible to conclude in favour of one instrument over the other (Parsons and Phillips, 2007; David et al., 2000; Czarnitzki and Hussinger, 2018; OECD, 2020). A study by the OECD suggests similar degrees of input additionality for both direct and indirect R&D supports, measured at 1.4%, as well as potential complementarity between the two instruments. It also concludes that direct supports appear to promote more research, while tax support is more associated with the increase in experimental development (OECD, 2020). Czarnitzki et al. (2011) and Demers (2021) show the positive effect of R&D tax credits and R&D direct support on business performance in Canada. Bérubé and Mohnen (2009) found that Canadian firms that benefited from both policy instruments introduced more new products than their counterparts that benefited from only R&D tax incentives. These recipients also made more world-first product innovations and were more successful in commercializing their innovations.

Over the last decade, R&D tax incentives have become a major business innovation support policy tool in OECD countries, such that their share in total government support for business R&D in the OECD increased from 30% in 2000 to around 50% in 2017 (OECD, 2020). The next section discusses the Government of Canada's direct and indirect tools to support innovation.

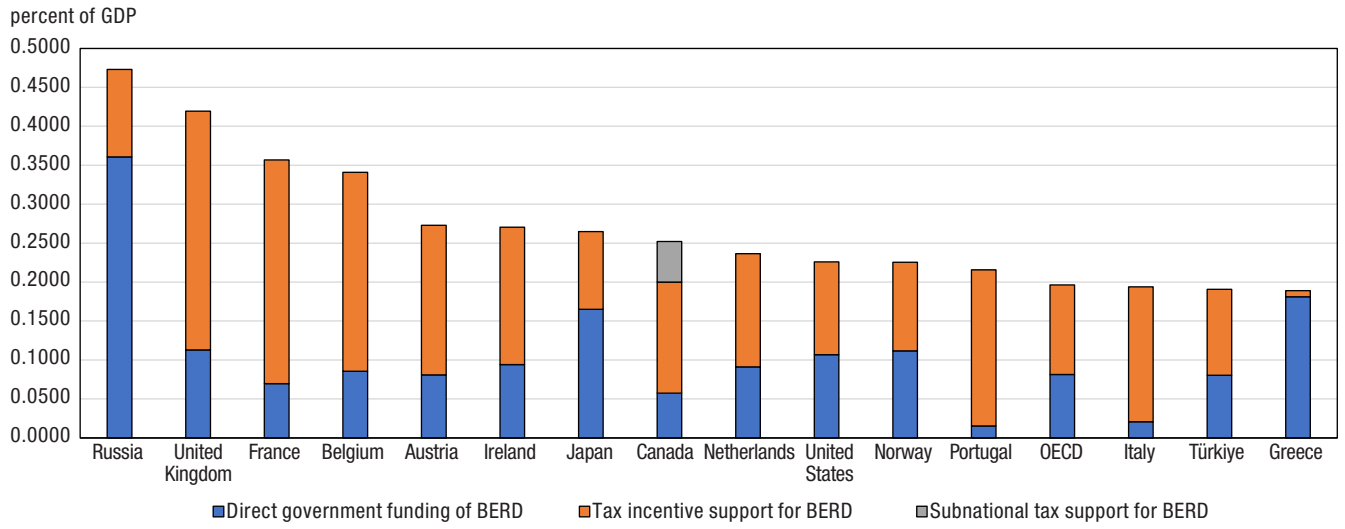
3 Government support for innovation in Canada

3.1 Overview

Countries differ in the extent to which they rely on direct and indirect measures to support R&D. Moreover, the design of tools differs substantially from one country to another, in terms of the scope and definition of R&D expenditures; the choice of eligible R&D expenditures and tax instruments; targeted tax relief provisions; types of firms, industries or activities; etc. (OECD, 2022).

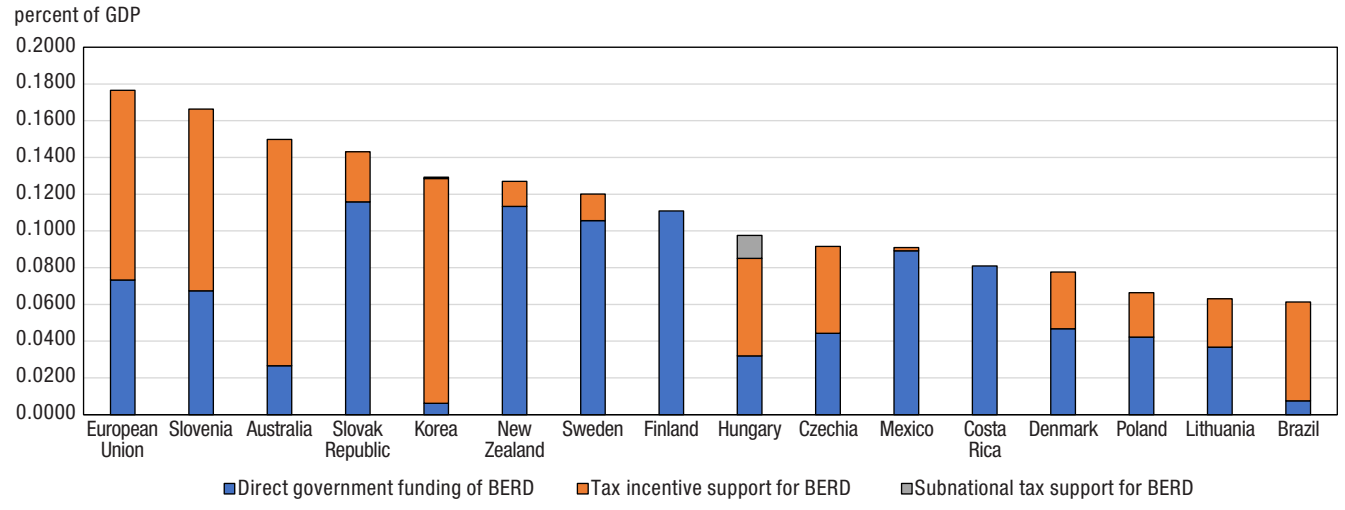
Charts 1.a to 1.c present direct and indirect government support for business R&D among the OECD countries. In 2019, total government support for business R&D in Canada was at 0.25% of gross domestic product, slightly above the OECD average. Moreover, the marginal federal tax subsidy rate for SMEs was 0.31%, which was higher than the OECD median of 0.20%. The rate for large enterprises was 0.13%, which was lower than the OECD median of 0.17% (OECD, 2021).

Chart 1a
Direct and indirect government support for business expenditures in research and development, by country, 2019



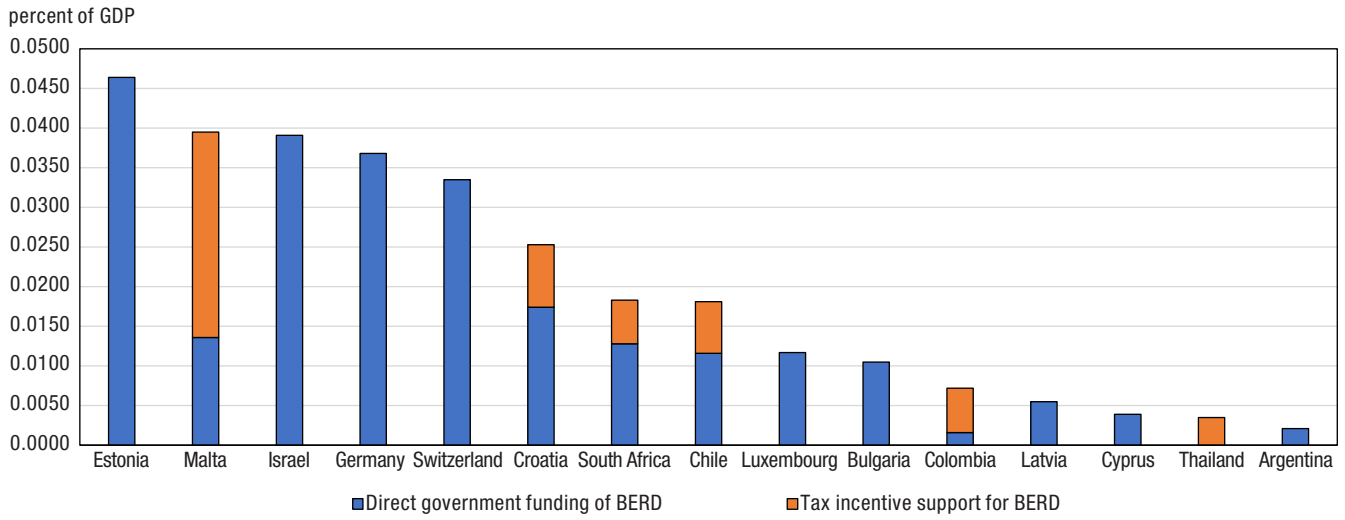
Note: BERD stands for business expenditures in research and development, OECD stands for Organisation for Economic Co-operation and Development, and GDP stands for gross domestic product.
Source: Authors' calculations based on the Organisation for Economic Co-operation and Development, 2024.

Chart 1b
Direct and indirect government support for business expenditures in research and development, by country, 2019



Note: BERD stands for business expenditures in research and development and GDP stands for gross domestic product.
Source: Authors' calculations based on the Organisation for Economic Co-operation and Development, 2024.

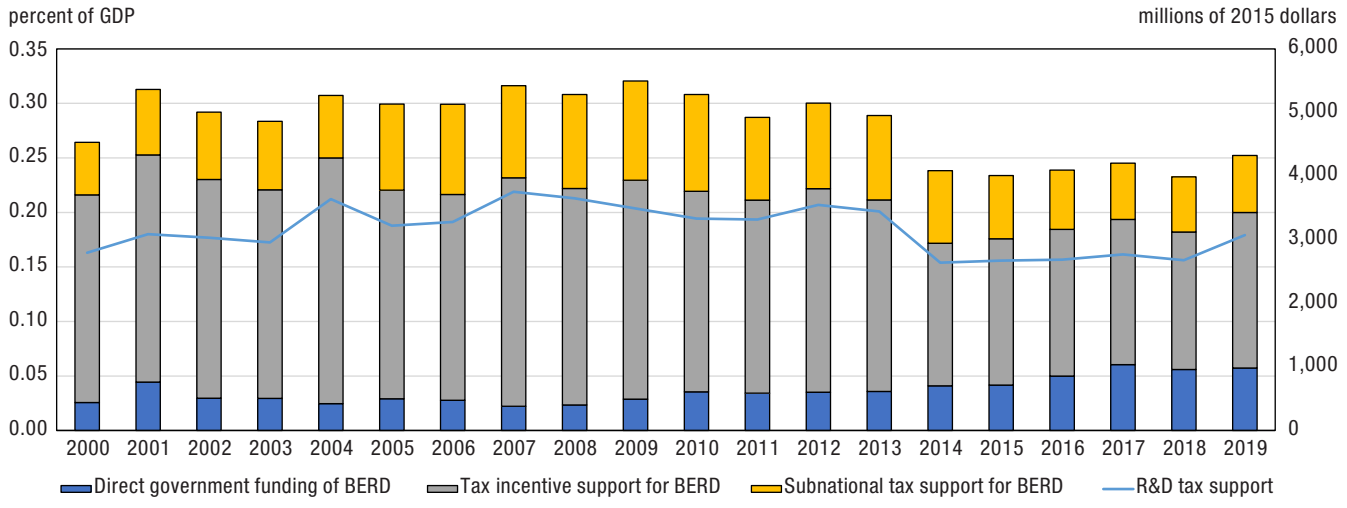
Chart 1c
Direct and indirect government support for business expenditures in research and development, by country, 2019



Note: BERD stands for business expenditures in research and development and GDP stands for gross domestic product.
Source: Authors' calculations based on the Organisation for Economic Co-operation and Development, 2024.

Although the OECD (2022) suggests that more countries rely on tax supports to encourage business R&D now than a decade ago, Canada has shifted toward direct measures. This is because Canada's indirect support had been historically high and one of the most generous in the world, yet its business expenditures on R&D were lower than the OECD average (Parsons and Phillips, 2007; Science, Technology and Innovation Council, 2011; Government of Canada, 2011; OECD, 2012; Innovation, Science and Economic Development Canada [ISED] 2019). After reviewing 60 government stimulus R&D programs for the 2010/2011 fiscal year, the Science, Technology and Innovation Council (2011) estimated that out of approximately $5 billion in spending to support R&D, about 70% was contributed from the indirect measure (SR&ED), and the other 30% came from 59 direct expenditure programs. Given the importance of the right combination of direct and indirect R&D support instruments, the Science, Technology and Innovation Council (2011) recommended decreasing spending through the SR&ED program and allocating the savings to direct measures. According to the report, the heavy reliance on SR&ED implied that federal support for innovation might be overweighted toward subsidizing the cost of business R&D, rather than other important aspects of innovation. Similarly, the Science, Technology and Innovation Council (2014) reported that in 2013, Canada ranked 4th out of 38 countries in indirect government support for business R&D but 28th in direct funding. Chart 2 presents the trend of government support for business R&D from 2000 to 2019, suggesting that the importance of tax incentives has been high in Canada, in both absolute and relative terms (OECD, 2021).

Chart 2
Direct and indirect government support for business expenditures in research and development in Canada, 2000 to 2019



Note: BERD stands for business expenditures in research and development, R&D stands for research and development, and GDP stands for gross domestic product.
Source: Authors' calculations based on the Organisation for Economic Co-operation and Development, 2024.

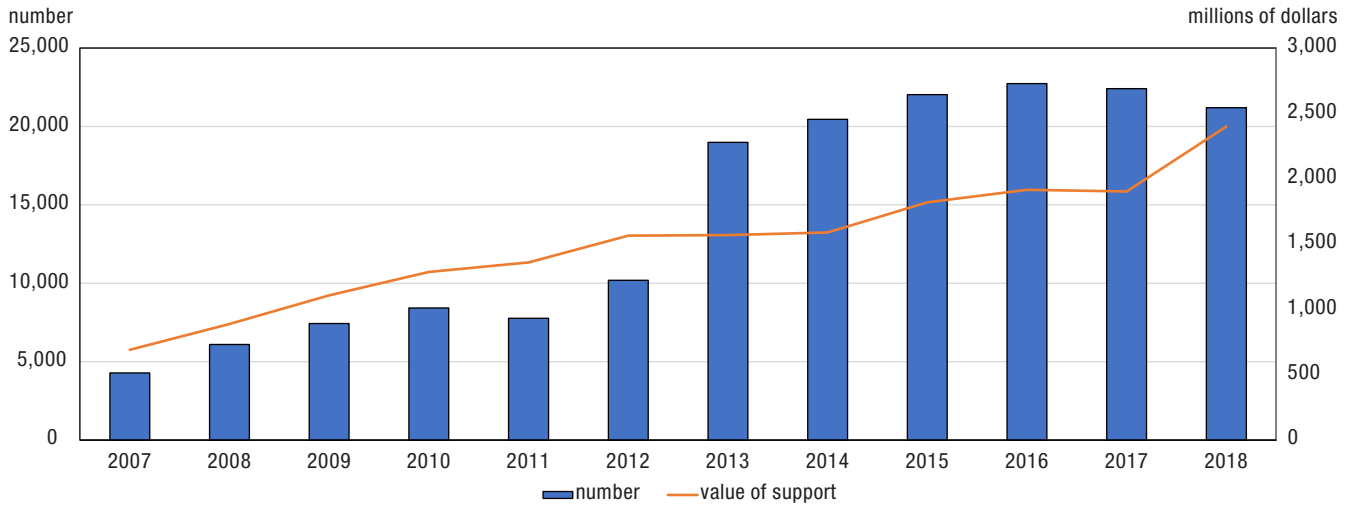
3.2 Business innovation and growth support programs

Most of the Government of Canada's direct support for business innovation is captured via the BIGS initiative. BIGS programs support business innovation and growth activities such as funding and consulting services for enterprises, industry-facing R&D, partnerships, technology development, commercialization, and exports. The scope does not currently include fundamental science, tax expenditures, provincial and territorial programs, and Crown corporations of the Government of Canada (Statistics Canada, 2023). Also, BIGS is not exclusive to R&D support; it includes support for business growth as well.

In 2019, 18 government departments provided more than $3.1 billion in support to around 22,000 ultimate beneficiary enterprises through 136 program streams (Treasury Board of Canada Secretariat [TBS], 2021). As shown in Chart 3, both total investment and the number of recipients increased from 2007/2008 to 2018/2019. The increase in BIGS spending and in the number of recipients is aligned with recommendations for the Government of Canada to provide more direct financial support to firms to stimulate innovation (TBS, 2018; ISED, 2019).

Chart 4 presents the average annual value of BIGS from 2014/2015 to 2018/2019 by organization. The five organizations reporting the highest average annual spending on BIGS over the period are ISED, the Natural Sciences and Engineering Research Council, National Research Council Canada, the Atlantic Canada Opportunities Agency, and Natural Resources Canada (NRCan).

Chart 3
Number of business innovation and growth support ultimate beneficiary enterprises and total value of support, 2007 to 2018

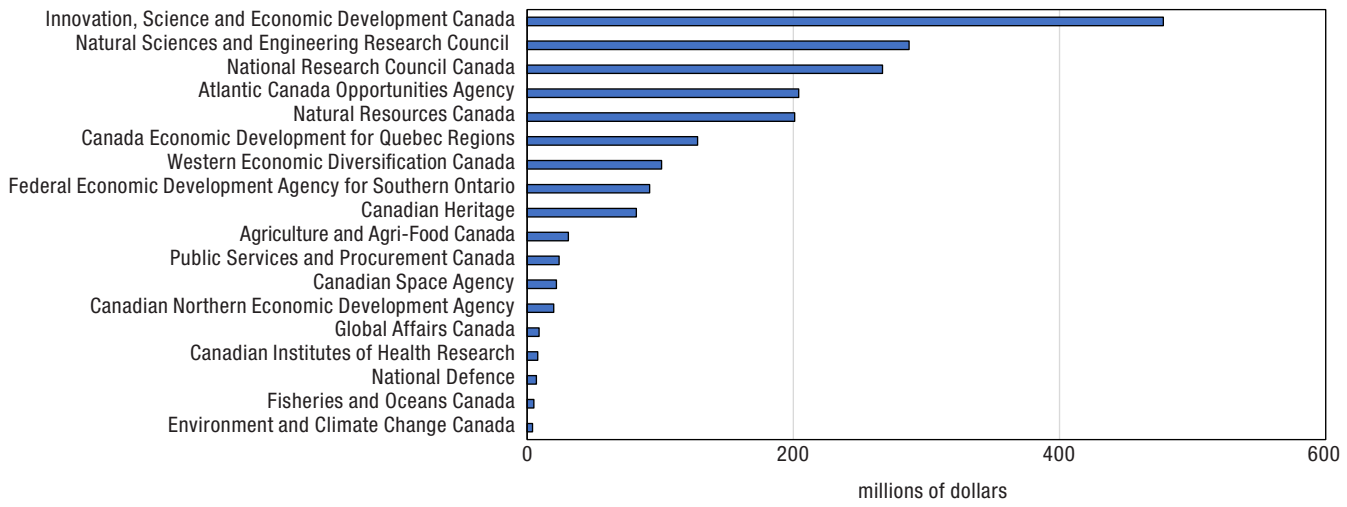


Source: Statistics Canada, Table 33-10-0221-01.

BIGS departments and agencies provide funding or in-kind support to enterprises through program streams. In 2019/2020, 136 program streams were identified as BIGS programs. About two-thirds of the program streams were in the ISED portfolio, consistent with its mandate and focus on enterprise support. Outside the ISED portfolio, NRCan and Agriculture and Agri-Food Canada accounted for the greatest number of program streams, at 15% and 6%, respectively.

Departments and agencies may deliver funds directly to enterprises as the final recipients, or they may transfer funds to an intermediary—typically a not-for-profit organization—which then delivers the funds or services to enterprises. Some programs provide support directly to final recipients and indirectly through intermediaries.

Chart 4
Average annual value of business innovation and growth support by federal departments and agencies, 2014 to 2018



Source: Treasury Board of Canada Secretariat, 2021.

3.3 Scientific Research and Experimental Development tax incentive program

The SR&ED tax incentive program is the Government of Canada's main indirect tool to support innovation. SR&ED uses tax incentives to encourage Canadian businesses of all sizes and in all sectors to conduct R&D in Canada. In 2019, the program provides more than $3 billion in tax incentives to over 20,000 firms annually, making it the single largest federal program that supports business R&D in Canada (Canada Revenue Agency [CRA], 2023).

To claim SR&ED tax incentives, the work of businesses must meet two requirements:[1]

- The work is conducted for the advancement of scientific knowledge or for the purpose of achieving a technological advancement.
- The work is a systematic investigation or search that is carried out in a field of science or technology by means of experiment or analysis.

Eligible work may include basic research, applied research and experimental development, including activities related to engineering, design, operations research, mathematical analysis, computer programming, data collection, testing and psychological research.

Examples of work that does not qualify for the SR&ED tax incentive program include market research or sales promotion; quality control or routine testing of materials, devices, products or processes; research in the social sciences or the humanities; the prospecting, exploration or drilling for, or production of, minerals, petroleum or natural gas; the commercial production of a new or improved material, device or product, or the commercial use of a new or improved process; style changes; routine data collection.

Note that BIGS and SR&ED can be used together, though not for the same expenditures. The next section compares BIGS and SR&ED.

4 Business innovation and growth support and Scientific Research and Experimental Development tax incentive program statistics

In 2019, a total of 22,050 enterprises received BIGS and 23,140 enterprises received SR&ED (Table 1). These recipients accounted for 0.79% and 0.82% of all enterprises in Canada, respectively.

Table 1 presents the share of BIGS and SR&ED recipients by revenue size in 2019. For both BIGS and SR&ED, the highest number of recipients belonged to the revenue group of $1,000,000 to $9,999,999, followed by the revenue group of $100,000 to $999,999. SR&ED covered relatively more enterprises in these two categories. It should be noted that 19.21% of BIGS recipients do not have a revenue size (see footnote 1 of Table 1), compared with 2.01% of SR&ED recipients.

1 Corporations may be eligible to claim these federal tax credits when filing their T2 Corporation Income Tax Return: Scientific research and experimental development (SR&ED) tax incentives.

Table 1
Enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by corporate revenue, 2019

Corporate revenue	Received BIGS and SR&ED	Received BIGS but not SR&ED	Received SR&ED but not BIGS	Did not receive BIGS or SR&ED	Total BIGS	Total SR&ED
	number				percent	
Greater than $0 to $99,999	520	1,635	990	768,180	9.77	6.53
$100,000 to $999,999	1,570	3,515	6,285	938,360	23.06	33.95
$1,000,000 to $9,999,999	2,330	3,945	7,135	268,045	28.46	40.90
$10,000,000 or higher	1,715	2,585	2,130	38,600	19.50	16.62
Unclassified[1]	140	4,095	325	755,440	19.21	2.01
Total	6,275	15,775	16,865	2,768,625	100.00	100.00

1. The unclassified category includes enterprises with a total corporate (T2) revenue that is $0, negative or missing. Therefore, the tables presented in this section show the T2 total revenue breakdown for incorporated businesses that filed a T2. Most businesses do not file a T2. For example, the BIGS data can contain a non-negligible number of businesses that either reported business income on a personal tax form (T1) or filed a T3010 or a T5013.

Notes: Totals differ between tables 1, 2, 5 and 7 because of rounding. Percentages do not add up to 100% because of rounding. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.

Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 2
Enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by employment size, 2019

Employment size	Received BIGS and SR&ED	Received BIGS but not SR&ED	Received SR&ED but not BIGS	Did not receive BIGS or SR&ED	Total BIGS	Total SR&ED
	number				percent	
0 employees	65	490	475	186,575	2.52	2.33
1 to 4 employees	1,005	3,100	5,320	748,740	18.62	27.34
5 to 19 employees	2,130	3,405	4,655	311,585	25.10	29.33
20 to 99 employees	1,900	2,695	2,955	85,005	20.84	20.99
100 to 249 employees	495	750	545	9,255	5.65	4.50
250 to 499 employees	195	340	160	2,260	2.43	1.53
500 employees or more	290	630	135	1,775	4.17	1.84
No employment data[1]	190	4,370	2,620	1,423,430	20.68	12.15
Total	6,270	15,780	16,865	2,768,625	100.00	100.00

1. The data source for employment is the PD7 payroll deduction file. The PD7 form is filled by any business with employees required to send in Canada Pension Plan contributions, Employment Insurance premiums and income tax deductions to the Canada Revenue Agency on their behalf. For example, self-employed individuals would not file a PD7 form; they could partly explain the category "No employment data."

Notes: Totals differ between tables 1, 2, 5 and 7 because of rounding. Percentages do not add up to 100% because of rounding. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.

Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 2 presents the number of BIGS and SR&ED recipients in 2019 by employment size and their shares. For both BIGS and SR&ED, most recipients had fewer than 100 employees. SR&ED targets smaller recipients (fewer than 20 employees), compared with BIGS. Tables 1 and 2 suggest that BIGS and SR&ED had similar coverage in terms of the number of recipients in 2019, though their distributions by revenue and employment size are slightly different.

Table 3 presents the value of BIGS and SR&ED by revenue size in 2019. The total value of BIGS was $3.13 billion, and that of SR&ED was $3.28 billion. Even though less than 20% of BIGS and SR&ED recipients had a revenue of $10 million or more, they received 32.81% of the total value of BIGS and 57.38% of that of SR&ED. The total value received for both BIGS and SR&ED increases with the recipient's revenue size.

Table 3
Value of business innovation and growth support and Scientific Research and Experimental Development tax incentives, by corporate revenue, 2019

	Value of BIGS				Value of SR&ED			
	Received BIGS and SR&ED	Received BIGS but not SR&ED	Total BIGS		Received SR&ED and BIGS	Received SR&ED but not BIGS	Total SR&ED	
Corporate revenue	thousands of dollars		thousands of dollars	percent	thousands of dollars		thousands of dollars	percent
Greater than $0 to $99,999	35,991	53,459	89,450	2.86	36,245	31,817	68,062	2.07
$100,000 to $999,999	144,974	179,774	324,748	10.38	164,175	180,105	344,280	10.49
$1,000,000 to $9,999,999	289,815	497,120	786,935	25.16	477,470	472,560	950,030	28.95
$10,000,000 or higher	544,795	481,547	1,026,342	32.81	1,335,512	547,247	1,882,759	57.38
Unclassified[1]	7,649	892,669	900,318	28.78	15,101	21,257	36,358	1.11
Total	1,023,224	2,104,569	3,127,793	100.00	2,028,504	1,252,985	3,281,489	100.00

1. The unclassified category includes enterprises with a total corporate (T2) revenue that is $0, negative or missing. Therefore, the tables presented in this section show the T2 total revenue breakdown for incorporated businesses that filed a T2. Most businesses do not file a T2. For example, the BIGS data can contain a non-negligible number of businesses that either reported business income on a personal tax form (T1) or filed a T3010 or a T5013.
Notes: Percentages do not add up to 100% because of rounding. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 4 presents the value of BIGS and SR&ED by employment size in 2019. The largest value shares belong to enterprises with 5 to 99 employees and those with 500 employees or more. BIGS provided slightly more support to large enterprises than SR&ED.

Table 4
Value of business innovation and growth support and Scientific Research and Experimental Development tax incentives, by employment size, 2019

	Value of BIGS				Value of SR&ED			
	Received BIGS and SR&ED	Received BIGS but not SR&ED	Total BIGS		Received SR&ED and BIGS	Received SR&ED but not BIGS	Total SR&ED	
Employment size	thousands of dollars		thousands of dollars	percent	thousands of dollars		thousands of dollars	percent
0 employees	2,990	17,722	20,712	0.66	4,407	9,879	14,286	0.44
1 to 4 employees	49,445	138,954	188,399	6.02	60,947	124,566	185,513	5.65
5 to 19 employees	228,985	362,736	591,721	18.92	287,963	323,293	611,256	18.63
20 to 99 employees	279,600	400,260	679,860	21.74	527,817	415,063	942,880	28.73
100 to 249 employees	91,768	129,361	221,129	7.07	207,646	135,639	343,285	10.46
250 to 499 employees	31,180	88,688	119,868	3.83	117,046	87,721	204,767	6.24
500 employees or more	333,373	669,462	1,002,835	32.06	811,309	109,490	920,799	28.06
No employment data[1]	5,884	297,387	303,271	9.70	11,369	47,334	58,703	1.79
Total	1,023,224	2,104,569	3,127,793	100.00	2,028,504	1,252,985	3,281,489	100.00

1. The data source for employment is the PD7 payroll deduction file. The PD7 form is filled by any business with employees required to send in Canada Pension Plan contributions, Employment Insurance premiums and income tax deductions to the Canada Revenue Agency on their behalf. For example, self-employed individuals would not file a PD7 form; they could partly explain the category "No employment data."
Notes: Percentages do not add up to 100% because of rounding. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Tables 5 and 6 show the number of enterprises that received BIGS and SR&ED and the values by industry in 2019. Most recipients were in manufacturing (North American Industry Classification System [NAICS] 31 to 33); professional, scientific and technical services (NAICS 54); and educational services, and health care and social assistance (NAICS 61 and 62). Agriculture, forestry, fishing and hunting (NAICS 11) included significantly more SR&ED recipients than BIGS, while the value of BIGS was higher for this sector. Within NAICS 54, computer systems design and related services (NAICS 5415) and scientific research and development services (NAICS 5417) included most recipients.

Table 5
Enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by industry, 2019

Industry	Received BIGS and SR&ED	Received BIGS but not SR&ED	Received SR&ED but not BIGS	Did not receive BIGS or SR&ED	Total BIGS	Total SR&ED
	number					
Agriculture, forestry, fishing and hunting (11)	140	995	5,060	91,400	1,135	5,200
Mining, quarrying, and oil and gas extraction (21)	55	275	75	19,075	330	130
Utilities (22)	10	105	15	2,110	115	25
Construction (23)	90	385	310	311,490	475	400
Manufacturing (31 to 33)	2,010	2,845	3,425	73,315	4,855	5,435
Food manufacturing (311)	130	535	195	8,445	665	325
Chemical manufacturing (325)	175	190	245	2,515	365	420
Pharmaceutical and medicine manufacturing (3254)	45	60	55	530	105	100
Plastics and rubber products manufacturing (326)	90	110	240	2,370	200	330
Fabricated metal product manufacturing (332)	145	320	545	10,355	465	690
Machinery manufacturing (333)	395	335	630	6,205	730	1,025
Computer and electronic product manufacturing (334)	340	150	310	2,155	490	650
Electrical equipment, appliance and component manufacturing (335)	130	105	150	1,805	235	280
Transportation equipment manufacturing (336)	165	170	175	2,700	335	340
Wholesale trade (41)	350	1,250	805	83,755	1,600	1,155
Retail trade (44 to 45)	115	515	245	174,765	630	360
Transportation and warehousing (48 to 49)	40	230	95	150,655	270	135
Information and cultural industries (51)	415	925	635	35,515	1,340	1,050
Software publishers (5112)	245	130	350	2,460	375	595
Telecommunications, and data processing, hosting and related services (517, 518)	85	90	165	4,670	175	250
Finance and insurance, and real estate and rental and leasing (52, 53)	115	455	330	442,680	570	445
Professional, scientific and technical services (54)	2,585	3,370	3,890	357,295	5,955	6,475
Computer systems design and related services (5415)	1,320	1,205	2,160	89,800	2,525	3,480
Scientific research and development services (5417)	570	530	505	4,565	1,100	1,075
Management of companies and enterprises, and administrative and support, waste management and remediation services (55, 56)	165	660	325	169,255	825	490
Educational services, and health care and social assistance (61, 62)	95	800	1,360	190,535	895	1,455
All other services (71, 72, 81)	50	1,350	225	348,200	1,400	275
Unclassified[1]	40	1,620	70	318,580	1,660	110
Information and communication technology—Manufacturing (3341, 3342, 3343, 3344, 3346)	150	80	175	1,500	230	325
Information and communication technology—Services-producing industries (4173, 5112, 517, 518, 5415, 8112)	1,715	1,495	2,785	103,595	3,210	4,500

1. The unclassified category includes enterprises that could not be classified in an industry of the North American Industry Classification System.
Notes: Totals differ between tables 1, 2, 5 and 7 because of rounding. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 6
Value of business innovation and growth support and Scientific Research and Experimental Development tax incentives, by industry, 2019

Industry	Value of BIGS			Value of SR&ED		
	Received BIGS and SR&ED	Received BIGS but not SR&ED	Total BIGS	Received BIGS and SR&ED	Received SR&ED but not BIGS	Total SR&ED
	thousands of dollars					
Agriculture, forestry, fishing and hunting (11)	8,177	41,242	49,419	12,215	15,929	28,144
Mining, quarrying, and oil and gas extraction (21)	26,347	14,836	41,183	105,065	13,957	119,022
Utilities (22)	x	x	x	2,782	2,351	5,133
Construction (23)	5,989	22,761	28,750	10,847	20,183	31,030
Manufacturing (31 to 33)	458,575	341,728	800,303	590,298	382,083	972,381
Food manufacturing (311)	14,630	49,952	64,582	13,642	13,347	26,989
Chemical manufacturing (325)	24,436	17,792	42,228	58,667	32,740	91,407
Pharmaceutical and medicine manufacturing (3254)	9,481	3,314	12,795	21,131	16,968	38,099
Plastics and rubber products manufacturing (326)	6,932	7,103	14,035	15,537	23,795	39,332
Fabricated metal product manufacturing (332)	25,969	46,904	72,873	21,197	39,043	60,240
Machinery manufacturing (333)	113,105	30,121	143,226	100,146	62,525	162,671
Computer and electronic product manufacturing (334)	53,209	19,944	73,153	135,574	71,955	207,529
Electrical equipment, appliance and component manufacturing (335)	20,089	10,488	30,577	28,742	13,716	42,458
Transportation equipment manufacturing (336)	83,977	23,207	107,184	140,222	19,825	160,047
Wholesale trade (41)	39,546	40,726	80,272	242,625	87,331	329,956
Retail trade (44 to 45)	8,834	9,069	17,903	15,418	13,923	29,341
Transportation and warehousing (48 to 49)	x	x	x	40,996	6,248	47,244
Information and cultural industries (51)	56,889	72,158	129,047	202,610	87,825	290,435
Software publishers (5112)	37,291	11,331	48,622	126,345	53,707	180,052
Telecommunications, and data processing, hosting and related services (517, 518)	14,439	4,769	19,208	61,695	23,390	85,085
Finance and insurance, and real estate and rental and leasing (52, 53)	4,590	38,635	43,225	54,561	31,000	85,561
Professional, scientific and technical services (54)	297,819	302,002	599,821	619,827	487,334	1,107,161
Computer systems design and related services (5415)	142,922	63,563	206,485	347,170	278,129	625,299
Scientific research and development services (5417)	99,560	163,156	262,716	152,663	107,854	260,517
Management of companies and enterprises, and administrative and support, waste management and remediation services (55, 56)	51,962	59,522	111,484	107,512	34,204	141,716
Educational services, and health care and social assistance (61, 62)	17,074	597,616	614,690	14,245	51,901	66,146
All other services (71, 72, 81)	3,166	260,417	263,583	8,537	13,639	22,176
Unclassified[1]	353	6,822	7,175	966	5,075	6,041
Information and communication technology—Manufacturing (3341, 3342, 3343, 3344, 3346)	23,235	13,271	36,506	69,279	33,747	103,026
Information and communication technology—Services-producing industries (4173, 5112, 517, 518, 5415, 8112)	210,633	84,064	294,697	607,808	376,834	984,642

x suppressed to meet the confidentiality requirements of the *Statistics Act*

1. The unclassified category includes enterprises that could not be classified in an industry of the North American Industry Classification System.

Notes: This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.

Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 7 shows that in 2019, most BIGS and SR&ED recipients were in Ontario, followed by Quebec, British Columbia and Alberta. Table 8 shows the same distribution in terms of value. However, tables 7 and 8 suggest that BIGS was received more than SR&ED in the four Atlantic provinces and SR&ED was received more than BIGS in Ontario. Moreover, while more enterprises received BIGS than SR&ED in Quebec and British Columbia, the total value of SR&ED was more than that of BIGS in these provinces. The situation was reversed in Alberta.

Table 7
Enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by region, 2019

Region	Received BIGS and SR&ED	Received BIGS but not SR&ED	Received SR&ED but not BIGS	Did not receive BIGS or SR&ED	Total BIGS	Total SR&ED
	number					
Atlantic	330	2,325	315	133,330	2,655	645
Quebec	1,640	3,365	2,885	549,840	5,005	4,525
Ontario	2,370	5,085	7,260	1,086,235	7,455	9,630
Manitoba	135	400	405	75,510	535	540
Saskatchewan	115	420	2,925	79,865	535	3,040
Alberta	620	1,630	1,315	390,815	2,250	1,935
British Columbia and the territories	1,065	2,520	1,750	438,475	3,585	2,815
Unclassified	0	30	10	14,555	30	10

Notes: Totals differ between tables 1, 2, 5 and 7 because of rounding. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 8
Value of business innovation and growth support and Scientific Research and Experimental Development tax incentives, by region, 2019

	Value of BIGS			Value of SR&ED		
Region	Received BIGS and SR&ED	Received BIGS but not SR&ED	Total BIGS	Received BIGS and SR&ED	Received SR&ED but not BIGS	Total SR&ED
	thousands of dollars					
Atlantic	89,607	332,007	421,614	38,482	17,074	55,556
Quebec	274,148	495,832	769,980	509,298	375,346	884,644
Ontario	358,412	671,803	1,030,215	958,583	557,844	1,516,427
Manitoba	17,111	45,889	63,000	26,370	16,930	43,300
Saskatchewan	21,298	82,824	104,122	14,275	11,045	25,320
Alberta	133,292	213,440	346,732	185,853	99,256	285,109
British Columbia and the territories	129,356	259,030	388,386	295,643	174,760	470,403
Unclassified	0	3,744	3,744	0	731	731

Notes: This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 9 suggests that R&D performers receive more SR&ED than BIGS. This result is not surprising, given that SR&ED is a tax incentive program for R&D spending. Tables 10 and 11 suggest that most R&D is conducted by large enterprises, either in terms of revenue or in terms of employment, followed by medium-sized enterprises.

Table 9
Enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by value of research and development spending, 2019

	Received BIGS and SR&ED	Received BIGS but not SR&ED	Received SR&ED but not BIGS	Did not receive BIGS or SR&ED	Total
Value of R&D spending			number		
R&D spending greater than $0	6,100	755	10,620	1,135	18,610
$0 R&D spending[1]	170	15,025	6,245	2,767,490	2,788,930
Total	6,270	15,780	16,865	2,768,625	2,807,540

1. Enterprises with $0 in R&D spending in a given year may receive an SR&ED tax incentive. This could be because of timing in the tax data or because a business did not have R&D spending in a given year but received a tax incentive for unclaimed R&D spending in the prior year.
Notes: R&D stands for research and development. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file. The data sources for R&D spending are the Annual Survey of Research and Development in Canadian Industry and the T661 Scientific Research and Experimental Development (SR&ED) Expenditures Claim.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 10
Value of research and development spending for enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by corporate revenue, 2019

	Received BIGS and SR&ED	Received SR&ED but not BIGS	Received BIGS but not SR&ED	Did not receive BIGS or SR&ED	Total
Corporate revenue			thousands of dollars		
Greater than $0 to $99,999	101,702	61,961	54,445	30,288	248,396
$100,000 to $999,999	433,345	392,130	67,383	69,047	961,905
$1,000,000 to $9,999,999	1,599,015	1,290,219	253,559	308,020	3,450,813
$10,000,000 or higher	10,326,490	2,556,455	2,724,761	931,751	16,539,457
Unclassified[1]	78,532	32,884	82,750	29,454	223,620
Total	12,539,084	4,333,650	3,182,899	1,368,560	21,424,193

1. The unclassified category includes enterprises with a total corporate (T2) revenue that is $0, negative or missing. Therefore, the tables presented in this section show the T2 total revenue breakdown for incorporated businesses that filed a T2. Most businesses do not file a T2. For example, the BIGS data can contain a non-negligible number of businesses that either reported business income on a personal tax form (T1) or filed a T3010 or a T5013.
Notes: This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file. The data sources for R&D spending are the Annual Survey of Research and Development in Canadian Industry and the T661 Scientific Research and Experimental Development (SR&ED) Expenditures Claim.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 11
Value of research and development spending for enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by employment size, 2019

	Received BIGS and SR&ED	Received SR&ED but not BIGS	Received BIGS but not SR&ED	Did not receive BIGS or SR&ED	Total
Employment size			thousands of dollars		
0 employees	9,920	21,523	x	21,575	x
1 to 4 employees	145,077	250,148	28,622	30,542	454,389
5 to 19 employees	880,266	810,614	90,519	139,284	1,920,683
20 to 99 employees	1,911,306	1,392,063	487,432	340,367	4,131,168
100 to 249 employees	1,066,123	732,932	431,594	212,079	2,442,728
250 to 499 employees	1,040,129	446,360	391,951	226,919	2,105,359
500 employees or more	7,446,049	603,410	1,737,874	338,713	10,126,046
No employment data[1]	40,215	76,601	x	59,080	x
Total	12,539,084	4,333,650	3,182,899	1,368,560	21,424,193

x suppressed to meet the confidentiality requirements of the *Statistics Act*

1. The data source for employment is the PD7 payroll deduction file. The PD7 form is filled by any business with employees required to send in Canada Pension Plan contributions, Employment Insurance premiums and income tax deductions to the Canada Revenue Agency on their behalf. For example, self-employed individuals would not file a PD7 form; they could partly explain the category "No employment data."

Notes: This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file. The data sources for R&D spending are the Annual Survey of Research and Development in Canadian Industry and the T661 Scientific Research and Experimental Development (SR&ED) Expenditures Claim.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Tables 12 and 13 suggest that both BIGS and SR&ED support experimental development more than basic research.[2] While more basic or applied R&D performers received SR&ED than BIGS in 2019, the findings suggest that the percentage of spending in basic or applied research was higher for BIGS recipients compared to SR&ED recipients. Table 14 presents the relationship between R&D spending, BIGS and SR&ED by industry.

Table 12
Enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by nature of research and development, 2019

	Received BIGS and SR&ED	Received BIGS but not SR&ED	Received SR&ED but not BIGS	Did not receive BIGS or SR&ED	Total
Nature of R&D			number		
R&D spending greater than $0	6,100	755	10,620	1,135	18,610
Basic or applied R&D spending greater than $0	345	250	560	355	1,510
Basic or applied R&D spending greater than 30% of total R&D spending	310	180	510	200	1,200

Notes: R&D stands for research and development. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file. The data sources for R&D spending are the Annual Survey of Research and Development in Canadian Industry and the T661 Scientific Research and Experimental Development (SR&ED) Expenditures Claim.
Source: Statistics Canada, Business Linkable File Environment, 2022.

2 According to the OECD, "the term R&D covers three activities: basic research, applied research and experimental development. Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. Applied research is original investigation undertaken in order to acquire new knowledge. … Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes." (OECD, 2015)

Table 13
Percentage of research and development spending for enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by nature of research and development, 2019

Nature of R&D	Received BIGS and SR&ED	Received BIGS but not SR&ED	Received SR&ED but not BIGS	Did not receive BIGS or SR&ED	Total
	percent				
Basic or applied research	13	30	16	23	16
Experimental development	87	70	84	77	84

Notes: R&D stands for research and development. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 14
Value of research and development spending for enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives or not, by industry, 2019

Industry	Received BIGS and SR&ED	Received SR&ED but not BIGS	Received BIGS but not SR&ED	Did not receive BIGS or SR&ED	Total
	thousands of dollars				
Agriculture, forestry, fishing and hunting (11)	73,295	42,398	9,132	9,340	134,165
Mining, quarrying, and oil and gas extraction (21)	369,805	117,652	63,256	147,911	698,624
Utilities (22)	11,534	4,890	x	x	x
Construction (23)	27,431	50,443	2,790	11,930	92,594
Manufacturing (31 to 33)	3,884,107	1,133,266	627,555	220,494	5,865,422
Food manufacturing (311)	66,149	40,992	13,768	8,991	129,900
Chemical manufacturing (325)	439,872	173,119	155,040	27,838	795,869
Pharmaceutical and medicine manufacturing (3254)	112,188	111,968	139,851	14,268	378,275
Plastics and rubber products manufacturing (326)	74,942	89,249	33,186	10,683	208,060
Fabricated metal product manufacturing (332)	67,121	111,218	17,484	5,579	201,402
Machinery manufacturing (333)	612,871	194,433	74,863	27,938	910,105
Computer and electronic product manufacturing (334)	711,077	183,756	113,816	50,079	1,058,728
Electrical equipment, appliance and component manufacturing (335)	98,728	49,632	49,088	14,252	211,700
Transportation equipment manufacturing (336)	1,318,714	68,409	76,937	32,450	1,496,510
Wholesale trade (41)	1,524,083	330,727	172,701	61,682	2,089,193
Retail trade (44 to 45)	48,806	34,620	13,797	16,619	113,842
Transportation and warehousing (48 to 49)	93,311	13,061	x	3,439	x
Information and cultural industries (51)	2,024,748	287,107	212,526	202,567	2,726,948
Software publishers (5112)	1,173,803	192,982	52,867	149,798	1,569,450
Telecommunications, and data processing, hosting and related services (517, 518)	774,055	62,330	149,415	38,438	1,024,238
Finance and insurance, and real estate and rental and leasing (52, 53)	256,558	92,406	16,920	62,903	428,787
Professional, scientific and technical services (54)	3,244,136	1,946,225	1,453,623	570,606	7,214,590
Computer systems design and related services (5415)	1,576,177	1,071,155	701,007	251,960	3,600,299
Scientific research and development services (5417)	1,216,855	585,310	408,636	244,479	2,455,280
Management of companies and enterprises, and administrative and support, waste management and remediation services (55, 56)	902,283	116,950	224,903	37,025	1,281,161
Educational services, and health care and social assistance (61, 62)	53,375	122,974	20,309	12,795	209,453
All other services (71, 72, 81)	23,919	33,279	x	8,968	x
Unclassified[1]	1,694	7,650	x	x	x
Information and communication technology—Manufacturing (3341, 3342, 3343, 3344, 3346)	371,244	85,950	66,968	44,931	569,093
Information and communication technology—Services-producing industries (4173, 5112, 517, 518, 5415, 8112)	4,488,726	1,410,365	949,213	450,302	7,298,606
Total	12,539,084	4,333,650	3,182,899	1,368,560	21,424,193

x suppressed to meet the confidentiality requirements of the *Statistics Act*
1. The unclassified category includes enterprises that could not be classified in an industry of the North American Industry Classification System.
Notes: This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Tables 15 and 16 suggest that BIGS and SR&ED had similar impacts on the growth of enterprises' economic indicators. However, more analysis is required to verify whether there is a statistically significant difference between the impacts of these instruments.

Table 15
Median three-year change in financial characteristics of business innovation and growth support and Scientific Research and Experimental Development tax incentive for-profit enterprise recipients with at least one employee, by year

	BIGS			SR&ED		
	2014 to 2017	2016 to 2019	2017 to 2020	2014 to 2017	2016 to 2019	2017 to 2020
Financial characteristics	dollars per employee					
Three-year change in value added[1] per employee	5,735	…	6,843	5,297	…	7,103
	percent					
Three-year corporate revenue growth	5.8	…	4.6	4.5	…	3.2
Three-year employment growth	2.5	…	1.0	0.6	…	0.0
Three-year growth in R&D spending	5.1	3.4	…	3.8	2.4	…
Three-year export revenue growth	7.4	…	3.2	7.9	…	1.8
Three-year profit growth	6.4	…	4.0	4.9	…	2.7

… not applicable
1. Value added is defined as the net income or loss before tax (line 9970 of the General Index of Financial Information) plus the total annual pay from the payroll deduction (PD7) tax file.
Notes: R&D stands for research and development. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file. The data sources for R&D spending are the Annual Survey of Research and Development in Canadian Industry and the T661 Scientific Research and Experimental Development (SR&ED) Expenditures Claim.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 16
Number of high-growth-by-revenue business innovation and growth support and Scientific Research and Experimental Development tax incentive for-profit ultimate beneficiary enterprises with at least one employee, by year

	BIGS	SR&ED
Year	number	
2008	370	2,000
2009	350	1,640
2010	395	1,520
2011	375	1,495
2012	650	2,030
2013	1,100	1,825
2014	1,025	1,660
2015	1,150	1,695
2016	1,240	1,670
2017	1,210	1,660
2018	1,240	1,700
2019	1,405	1,630

Notes: A high-growth-by-revenue enterprise is an enterprise with 10 or more employees at the beginning of the period that has average annualized revenue growth greater than 20% per year over a three-year period. This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

Table 17 presents the breakdown of BIGS and SR&ED recipients by type of support. Among the firms that received BIGS and SR&ED, almost three-quarters received advisory services and over two-fifths received non-repayable contributions. About one-fifth of BIGS recipients benefited from both advisory services and non-repayable contributions in 2019. Almost one-fifth of BIGS recipients received other types of support, mainly as a collaborator with a main proponent on a supported project.

Table 17
Enterprises that received business innovation and growth support and Scientific Research and Experimental Development tax incentives, by type of support, 2019

	Types of BIGS support								
Types of support	Advisory services	Government-performed services	Conditionally repayable contribution	Unconditionally repayable contribution	Non-repayable contribution	Grant	Targeted procurement	Other BIGS support	SR&ED
	number								
Advisory services	14,485	610	210	505	3,805	585	230	1,640	4,695
Government-performed services	610	1,735	30	70	355	90	45	330	770
Conditionally repayable contribution	210	30	510	20	155	20	10	85	125
Unconditionally repayable contribution	505	70	20	1,255	455	35	25	175	480
Non-repayable contribution	3,805	355	155	455	7,095	360	155	995	2,625
Grant	585	90	20	35	360	800	55	215	355
Targeted procurement	230	45	10	25	155	55	330	95	180
Other BIGS support	1,640	330	85	175	995	215	95	4,155	1,610
SR&ED	4,695	770	125	480	2,625	355	180	1,610	23,140

Notes: This table shows only enterprises that were matched to Statistics Canada's Business Register. The statistical unit "enterprise" refers to the highest level of the Business Register statistical hierarchy. BIGS stands for business innovation and growth support. SR&ED stands for the Scientific Research and Experimental Development tax incentive program. The data source for SR&ED is the sum of lines 560, 580, 610, 911, 912 and 913 of Schedule 31 of the T2 Corporation Income Tax Return file.
Source: Statistics Canada, Business Linkable File Environment, 2022.

5 Conclusion

Governments can support R&D in the private sector through direct or indirect instruments. Direct instruments for R&D include grants, loans and procurement. Indirect instruments include R&D tax credits, R&D allowances and reductions in R&D workers' wage taxes. In Canada, BIGS and SR&ED are the two main instruments that the government uses to stimulate the R&D expenditures of the business sector.

This paper summarizes the advantages and disadvantages of the government's direct and indirect tools to support innovation, as highlighted in the literature. Empirical studies across OECD countries suggest that both BIGS and SR&ED can stimulate R&D expenditures and have a positive impact on the performance of recipients.

The descriptive analysis presented here compares BIGS and SR&ED support in Canada. In 2019, 22,050 enterprises received BIGS and 23,140 enterprises received SR&ED, while 6,275 received both supports. Enterprises receiving BIGS accounted for 0.79% of all enterprises, and those receiving SR&ED accounted for 0.82% of all enterprises. The highest number of recipients of both groups belonged to the revenue group of $1,000,000 to $9,999,999, followed by the revenue group of $100,000 to $999,999. Most recipients had fewer than 100 employees.

There are slight differences between the distribution of BIGS and SR&ED recipients by revenue and employment size. Total value received for both BIGS and SR&ED increased with the recipient's revenue size, and the SR&ED value was skewed toward enterprises with higher revenue. R&D performers received more SR&ED than BIGS. This result is not surprising because SR&ED is a tax incentive for R&D spending. While more basic or applied R&D performers received SR&ED than BIGS in 2019, the total BIGS value was higher for this category.

Further research can expand on this descriptive analysis and address questions such as:

- Which of these instruments, or their combination, stimulates R&D more effectively?
- Which instrument is more effective in terms of overall impacts on productivity and economic growth?
- What is the heterogeneity of effects across different types of firms and the interaction of different policies?

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