



*Tabled by the  
Minister of Tourism Culture  
Industry & Innovation  
The Conference Board  
of Canada*

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*2018-05-17  
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**PROVINCIAL**

**Innovation: Data Definitions and Sources**

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**Public R&D 2014**

2015 data for most countries. 2014 data for provinces. 2014 data for Australia. 2016 data for Canada, Germany, and Ireland.  
Expenditures on research and development (R&D) performed by the public (government and higher education) sector as a share of GDP.  
Sources: OECD, *Main Science and Technology Indicators*; Statistics Canada, CANSIM table 358-0001, Gross Domestic Expenditures on Research and Development, by Science Type and by Funder and Performance Sector; Statistics Canada, CANSIM table 384-0038, Gross Domestic Product, Expenditure-Based, Provincial and Territorial.

**Scientific articles 2014**

2014 data. Data were not available for Austria, Belgium, Denmark, Finland, Ireland, and Norway.  
This indicator measures the counts of authorship and co-authorship of peer-reviewed scientific articles produced in the natural sciences, engineering, social sciences, and humanities per million population. Articles with more than one Canadian author residing in different provinces are counted once in Canada, but counted once for each province where one of the authors resides. For example, an article published by three people who live in B.C., Saskatchewan, and Alberta would be counted once in the Canadian total, and counted once each for B.C., Saskatchewan, and Alberta. The data used for scientific articles in this iteration of the report card represent a new and expanded set from that used in the previous report card. Previously, we compared only article counts in the natural sciences and engineering, whereas the current report card includes articles in the social sciences and humanities. We moved to the new data because the previous data set is no longer updated and because Innovation depends not only on science and engineering but also on expertise and insights from social sciences and humanities—including management, marketing, design, psychology, and other people-centered disciplines, along with insights and developments in science, technology, and engineering.  
Council of Canadian Academies. (The data were collected and analyzed by ScienceMetrix for the Council of Canadian Academies and are on file with the Conference Board and the Council of Canadian Academies.) Statistics Canada, CANSIM table 051-0001, Estimates of Population, by Age Group and Sex for July 1, Canada, Provinces and Territories; OECD Stat.

**Researchers 2013**

2015 data for most countries. 2014 data for Canada. 2013 data for provinces. 2010 data for Australia.  
The indicator "researchers engaged in R&D" is measured as the number of full-time equivalent (FTE) researchers employed for every 1,000 individuals employed in a province or country. FTE "is a measure of the time actually devoted to research and development."<sup>1</sup> Conventionally, a full-time position entails working full-time hours for a full year. If an employee spends half her time on R&D and half on something else, she would count as 0.5 FTE. Similarly, if five people each worked 1 day per week on R&D for a year, together they would count as 1 FTE.  
The indicator includes individuals classified as "researchers" but excludes those classified as "technicians" and "other R&D personnel." Researchers are defined as scientists and engineers "engaged in the conception or creation of new knowledge, products, processes, methods and systems" and include managers "engaged in the planning and management of the scientific and technical aspects of a researcher's work."<sup>2</sup>

Sources: OECD, *Main Science and Technology Indicators*; Statistics Canada, CANSIM table 358-0160, Provincial Distribution of Personnel Engaged in Research and Development, by Performing Sector and Occupational Category; Statistics Canada, CANSIM table 282-0002, Labour Force Survey Estimates, by Sex and Detailed Age Group.

**Business enterprise R&D 2014**

2015 data for most countries. 2014 data for provinces. 2014 data for Ireland. 2013 data for Australia.

Expenditures on research and development (R&D) performed by the business sector as a percentage of GDP.

Sources: OECD, Main Science and Technology Indicators; Statistics Canada, CANSIM table 358-0001, Gross Domestic Expenditures on Research and Development, by Science Type and by Funder and Performance Sector; Statistics Canada, CANSIM table 384-0038, Gross Domestic Product, Expenditure-Based, Provincial and Territorial.

### Venture capital investment 2014-16

2015-16 data for countries. 2014-16 data for provinces.

This indicator measures venture capital investment (including early and late-stage investment) as a share of GDP. A two-year average is calculated for the international peers and a three-year average for the provinces to smooth out some of the year-to-year variability in venture capital investment, especially in smaller jurisdictions that see few deals. Collecting comparable data on venture capital investment across jurisdictions is challenging, and some variability in performance may be a result of data issues rather than actual differences in performance. As the OECD notes, "there are no standard international definitions of venture capital nor of the breakdown of venture capital investments by stage of development. In addition, the methodology for data collection differs across countries. Data on venture capital are sourced from national or regional venture capital associations that produce them."<sup>3</sup>

Sources: OECD, *Entrepreneurship At a Glance 2017*; Industry Canada, *Venture Capital Monitor*; Statistics Canada, CANSIM table 384-0038, Gross Domestic Product, Expenditure-Based, Provincial and Territorial.

### ICT investment 2015

2015 data for Canada and provinces. 2014 data for most countries. Data were not available for Norway.

Investment in information and communications technology (ICT) as a percentage of GDP. ICT investment has three components: software (including pre-packaged software, customized software, and software developed in-house), communications equipment, and IT equipment (computers and related hardware). Statistics Canada data were used for Canada and the provinces. These data are based on Statistics Canada's redeveloped capital stock program (released in November 2014), which uses new methodologies and classifications that, in turn, have resulted in revisions to investment levels. As a result, OECD's investment figures for Canada do not match the latest Statistics Canada figures. In the older CANSIM series based on the previous method, computers, telecommunications equipment, and software were three separate ICT components classified under machinery and equipment. In the new CANSIM series, there is no longer a separate category for telecommunications equipment; instead, it is classified under computers and electronics. Therefore, total ICT investment for Canada and the provinces is now calculated as the sum of investment in software and investment in computers and electronics.

Sources: OECD, *Science, Technology and Industry Outlook 2016*; Statistics Canada, CANSIM table 031-0007, Flows and Stocks of Fixed Non-Residential Capital; Statistics Canada, CANSIM table 384-0038, Gross Domestic Product, Expenditure-Based, Provincial and Territorial.

### Entrepreneurial ambition 2013

2016 data for most countries and provinces. 2015 data for Belgium and Norway. 2014 data for Denmark, Japan, and Nova Scotia. 2013 data for Saskatchewan, Manitoba, and Newfoundland and Labrador. Data were not available for P.E.I. and New Brunswick.

Entrepreneurial ambition is measured as the percentage of the population, aged 18 to 64, who report being involved in early-stage entrepreneurial activity, including those who self-identify as a *nascent entrepreneur* (i.e., actively involved in setting up a business that they will own or co-own but that has not yet paid wages, salaries, or any other payments to owners for more than three months) or an *owner-manager of a new business* (i.e., an owner or part-owner and manager of a running business that has paid salaries, wages, and other payments for more than three but fewer than 42 months).<sup>4</sup> Data are drawn from the Global Enterprise Monitor's annual global survey of more than 2,000 individuals in each of more than 100 countries.

Given that the data are based on self-reported activity rather than actual business starts, the results are used as an indicator not of entrepreneurial activity, but of respondents' enthusiasm for entrepreneurship—that is, as an indicator of entrepreneurial ambition.

Sources: Global Entrepreneurship Monitor, Key Indicators; Global Entrepreneurship Monitor, *Canada Report 2016*, *Canada Report 2014*, and *Canada Report 2013*.

### Patents by population 2013

2013 data.

Patents per population are measured as the number of patents filed under the Patent Cooperation Treaty (PCT) per million population

Sources: OECD, Patents by regions, OECD.Stat; Statistics Canada, CANSIM table 051-0001, Estimates of Population, by Age Group and Sex for July 1, Canada, Provinces and Territories.

**Enterprise entry**

2014

**2014 data. Provinces only.**

The enterprise entry rate is measured as the number of new businesses as a per cent of the number of active (i.e., entrant + incumbent) businesses in a given year. A business is defined as a private sector employer enterprise—incorporated or unincorporated—that issues one or more statements of remuneration paid (i.e., T4 slips) to its employee(s) for tax purposes. Business “entrants” are those with employees in the current year, but none in the previous year, while incumbent businesses are those with employees in the current and previous years.

Source: Statistics Canada, CANSIM table 527-0007, Business Dynamics Measures, by North American Industry Classification System (NAICS), Provinces and the Territories.

**Labour productivity**

2015

**2015 data**

Labour productivity is measured as GDP per hour worked in U.S. dollars at 2005 purchasing power parities and 2005 prices.

Sources: OECD Stat; Statistics Canada, CANSIM table 383-0031, Statistics Canada, CANSIM table 384-0038, Gross Domestic Product, Expenditure-Based, Provincial and Territorial; Statistics Canada, CANSIM table 384-0039, Implicit Prices Indexes, Gross Domestic Product, Provincial and Territorial.

**Footnotes**

- 1 Statistics Canada, “Research and Development Personnel.”
- 2 Ibid.
- 3 Organisation for Economic Co-operation and Development, *Entrepreneurship at a Glance 2014* (Paris: OECD, 2014), 22, 102-4; Industry Canada, *Venture Capital Monitor*.
- 4 Global Entrepreneurship Monitor, *Adult Population Survey Measures, 2015*.
- 5 Statistics Canada, CANSIM table 527-0007, Business Dynamics Measures, by North American Industry Classification System (NAICS), Provinces and the Territories.

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