

CPHR/CRHA

CHARTERED PROFESSIONALS
IN HUMAN RESOURCES
CANADA

CONSEILLERS EN RESSOURCES
HUMAINES AGRÉÉS
CANADA

Canada 150 and Beyond

The Role of Human Resources
in Canada's Prosperity

About CPHR Canada

Established in 1994 as the Canadian Council of Human Resources Associations (CCHRA) and officially becoming CPHR Canada in 2016, CPHR Canada represents a collaborative effort of human resources associations from across Canada. CPHR Canada is the national voice on the enhancement and promotion of the profession across Canada, through established and credible designations, collaborating on national issues related to the profession and proactively positioning the national human resources agenda at the international level.

The Human Resource Member Associations of CPHR Canada include: HRMA (BC), HRIA (Alberta), CPHR SK (Saskatchewan), CPHR MB (Manitoba), HRANB (New Brunswick), HRANS (Nova Scotia and Prince Edward Island), CPHR NL (Newfoundland and Labrador), and CHRA (Québec).

In October 2016, CCHRA/CPHR Canada announced that it, and the eight provincial associations constituting the national body, aligned under the new name and designation of CPHR - Chartered Professionals in Human Resources. Under one common designation, the CPHR (Chartered Professional in Human Resources), CPHR Canada and its member bodies adhere to consistent minimum requirements for certification and a common national Code of Conduct.

In the summer of 2016, CPHR Canada, representing 27,000 members strong, announced a strategic agreement with SHRM (Society for Human Resource Management), in the U.S.; the largest HR organization in the world. CPHR Canada is also Canada's representative with the North American Human Resources Management Association (NAHRMA) and the World Federation of People Management Associations (WFPMA).

CPHR Canada extends its appreciation to Professional Strategies Group Ltd. and to Dr. Kamalesh Gosalia for their contributions to this research brief.

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Foreword

Canada along with the rest of the world is gazing upon its Fourth Industrial Revolution. The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third – a digital revolution that has been building since the middle of the last century. It is characterized by a fusion of technologies that is effectively blurring the lines between physical, digital, and biological spheres.

The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge, are proving to be unlimited. And these possibilities will be multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing.

In arriving to where we are today, we have evolved through an era of measuring individual growth while entering an age where the prevalence of international benchmarking has fostered the expectation that countries having the same level of development should be performing at least comparably. Oftentimes, failure to meet or exceed these globally accepted benchmarks results in international speculation regarding the country's innovation, competitiveness and adaptation within a global context. In the future, the wealth of nations will be dependent upon the quality of human resources as measured by their productivity and their efficient deployment.

CPHR Canada is committed to collaboration as demonstrated by its acceptance of diverse interests, is committed also to innovation as demonstrated in its continuous pursuit of excellence in programs, products and services, and forward thinking in advancing the Human Resources profession; all the while attentive to leverage the collective creativity of the professional community to its fullest possible advantage. Consistent with these commitments, CPHR Canada commissioned a research study to profile Canadian Human Resources and the determinants of their efficiency and productivity. This report is a result of this research study.

The study is based on publicly available information published by such organizations as Statistics Canada, The Organisation for Economic Co-operation and Development (OECD), and The World Economic Forum (WEF). The report will be useful to Human Resources Professionals, Regulators and Policy Makers. As macroeconomic and technological disruptions continue to spur and to aggravate emerging challenges to Canada's future prosperity, the importance of marshaling effective and enlightened government and employer policy responses can simply not be overstated.

Executive Summary

Canada is transitioning from a resource-based economy to a knowledge-based economy. This change is necessitated by ongoing macroeconomic and technological advancement and disruption. The downward pressure on prices of oil and other resources for example has constrained growth potential of the Canadian economy. This disruption increasingly looks like a secular trend rather than the temporary aberration originally foretold by some industry leaders. In the era of this "new normal", Canada needs to find new ways for growing and ensuring prosperity for future generations of Canadians. This goal can be best achieved, or at least bolstered, by the development and deployment of an efficient and productive workforce which can confidently compete in a globalized economy.

Canada needs to dream big and to realize its full potential. The development of its human resources is a prerequisite for achieving this goal and ensuring sustainable long term prosperity of all Canadians. The future prosperity of Canada depends on the quality of human resources rather than on the abundance of natural resources. Efficiency and Productivity are two main attributes of high quality human resources. The terms efficiency and productivity although, often used interchangeably, have distinct connotations. However, their drivers overlap. The focus of this report is on these drivers at macro (economy) level rather than at micro (firm) level.

The trend indicators suggest that labour productivity typically declined since the mid-1990s or early 2000s in G7 countries. After the 2008 financial crisis, labour productivity growth declined significantly in most OECD countries with the decline broadly spread across sectors. Regrettably, Canada's labour productivity and growth fall below OECD averages over the same period.

Labour efficiency and productivity are important determinants of the competitiveness of an economy. The World Economic Forum (WEF) has developed a comprehensive framework for measuring the competitiveness of an economy. On the basis of this framework, its *Global Competitiveness Report 2016-17*¹ publication ranks Canada in 15th place.

The Statistics Canada census program 2011 indicates that the Canadian labour force was aging and almost one in five workers was aged 55 years and over. The employment level expressed as a percentage of the total population aged 15 years and over was trending downwards (60.9% in 2011 versus in 62.6% 2006). The employment level increased with education level but there was a gender based disparity in the major occupation groups in which men and women worked. The most common occupations for men were retail salesperson and truck driver while the most common occupations for women were retail salesperson and administrative assistant. There was considerable mobility among the workers and the general direction of migration was from eastern and southern provinces to northern and western regions. The recent economic insights report (Fall, 2016) from Statistics Canada indicates that employment growth lags output growth.

¹ http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf
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Efficiently deployed productive human resources are of paramount importance in building the wealth of a nation. The most influential drivers of productivity are Institutions, Innovation, Infrastructure, Investment, Health, Education and Job Satisfaction. The following paragraphs recapitulate Canada's scorecard with respect to these drivers.

- Generally speaking, public confidence in domestic institutions is high. Although there are opportunities for further improvement, regulatory burden is not received as a serious impediment to labour efficiency and productivity in Canada.
- Lack of innovation is however considered a serious impediment to the growth of Canadian labour efficiency and productivity. Our performance in this area has been described as dismal based on deteriorating domestic trends as well as international perspectives. A dynamic strategic policy response is urgently required for enabling Canada to assume a leadership position in this very critical element of the economy.
- As far as infrastructure is concerned, Canada is not in the top league. There is clear evidence that Canada needs to upgrade its infrastructure on an urgent basis to remain competitive in a globalized economy. Investment in this sector will yield important returns through increased productivity and efficiency of labour and other factors of production. The stated intention of the present government is to jumpstart the economy by investing in infrastructure projects. This thinking is in the right direction.
- Canadian businesses are not investing sufficiently in technology. In the long term, this deficiency will impact labour and overall productivity and render Canada less competitive globally. The Canadian government might be well justified to introduce necessary monetary and fiscal incentives intending to rectify this deficiency.
- Canada does well so far as school enrollment up to secondary education institutions is concerned but does lag at the tertiary level and in quality of education as benchmarked in PISA (OECD's Programme for International Student Assessment) reports. The training opportunities for employees, particularly older workers are limited. It is imperative to design a policy response to correct this situation for enhancing the quality of Canada's human resources and to foster employer enthusiasm in availing meaningful training and development.
- The universal Canadian health system is highly equitable but not the most efficient. The absence of growth in health spending as a percentage of GDP despite an aging population and long wait periods for visits to specialists are causes for concern. The wait period is also long for critical diagnostic and corrective procedures. It is critical to improve the system by innovating service delivery models and by more effectively allocating resources. Otherwise, there will be adverse impact not only on the health of Canadians but on the productivity of Canada's human resources.

- Canadians are generally happy with their jobs and private lives and their level of satisfaction compares well with that of other OECD and non-OECD countries. Canadian employers can further enhance job satisfaction and productivity of their employees by providing, where possible, flexible work schedules and other work-life balance measures.

The above scorecard synopsis indicates that Canada's record is mixed in absolute terms as and in relational context when compared to the other OECD countries. There is ample scope for further enhancement of the quality of Canada's human resources. The major factors impeding growth of labour productivity in Canada are **less investment in capital equipment** compared to other countries, **less focus on research and development**, **fewer large multinational firms** based in Canada, and **general risk aversion of Canadian businesses**.

The federal government can facilitate growth of labour productivity with appropriate policy instruments such as monetary and fiscal incentives for investing in capital equipment, innovation and research. The government is encouraged also to continue to upgrade infrastructure, to invest in education, and to strengthen the public health care system. Increasingly important also, the Canadian immigration system should be administered with a view to attracting and retaining the best talent in the world.

It goes without saying that Canadian employers (industry) play a significant role in nurturing Canada's productivity and competitiveness - not only complementing government's actions, but by adopting best practices in the management of human resources and investing sufficiently in innovation, research, training, and employee well-being, proactively shaping the Canadian economy.

1. Introduction

"Our ambitions for the Canadian economy should be bold. We are a country of immense strengths and, as demonstrated during the recent crisis, considerable resilience. Yet Canada does underperform. We are not as productive as we could be. Our potential growth is slowing. Moreover, this is occurring as the very nature of the global economy, in which we previously thrived, is under threat. This debate can no longer be avoided."

—Mark Carney, former Governor of the Bank of Canada²

The old economy was based on labour intensive manufacturing, mining of commodities, localized trade, and banking based on paper currencies. Advances in technology have transformed the old economy into new economy characterized by knowledge-based service industries, innovative and inexpensive telecommunication, global e-commerce and digital banking. Emerging technologies such as big data, artificial intelligence, machine learning and robotics will make many white collar, as well as blue collar, jobs redundant. An appropriate policy response is urgently warranted to meet these challenges.

Canada is at a point of inflection as it transitions to a knowledge-based economy from one more reliant on natural resources. The challenges facing the country can be best addressed by developing and optimizing available human resources. The future prosperity of Canada depends on the quality of human resources rather than the abundance of natural resources.

The objective of this report is to describe the drivers that enhance efficiency and productivity of Canada's human resources (at the macro or economy level). The report which is based on the extant research and reference material will facilitate developing appropriate policy responses from human resources professionals, regulators, decision-makers, and government authorities.

1.1. Efficiency & Productivity (Micro or Firm Level)

Labour is one of the factors of production along with capital, land (natural resources) and entrepreneurship. Hence efficiency and productivity of that labour are important determinants of the production function. The terms efficiency and productivity are often confused and used interchangeably. The following discussion differentiates them at the micro (firm) level and clarifies their meaning. To simplify the discussion, the scenario assumed is that of a single product output.

Labour efficiency refers to the maximum output that can be achieved from a given level of input, keeping other factors of production constant. Alternatively, it refers to the minimum labour input required to achieve given level of output, keeping other factors of production constant. For example, we may refer to the maximum possible production of ten cars by inputting 1,000 hours of labour or alternatively refer to 1,500 labour hours as the minimum

² <http://www.bankofcanada.ca/wp-content/uploads/2010/05/sp240310.pdf>
CPHR Canada

input required for the output of seventeen cars. It is to be noted that the relationship between output (Product) and input (Labour) is not necessarily linear. The labour efficiency so measured is *technical efficiency* and should be distinguished from *allocative efficiency* discussed below. The technical efficiency of labour can be enhanced by technological advances and increased deployment of capital and other resources.

Labour productivity is measured as the ratio of actual output and labour input without factoring in the other factors of production such as capital. For example, if the input of 2,100 labour hours produced fifteen cars, the productivity can be measured as $(15/2,100)$ 0.007143 car per labour hour. It is to be noted that the labour efficiency curve depicts the upper bound for labour productivity. Hence, labour efficiency focuses on minimizing the wastage of other factors of production while labour productivity focuses on maximizing total output, ignoring the wastage of other factors of production.

The above-mentioned discussion is based on physical quantities and technical relationships. If information related to costs and prices is known, it can be incorporated in performance measurement. Then, allocative efficiency can be measured in addition to technical efficiency. Allocative efficiency, in input selection requires optimizing selection of inputs (capital) such that a given level of output is achieved at minimum costs or maximum output is achieved at a given level of costs. The technical efficiency and allocative efficiency combine to provide overall efficiency of the production process. The following example further clarifies these concepts:

Example

Consider two plants, A and B, which manufacture cars. Plant A produces cars which sell for \$25,000 each and the wages are paid to labourers @\$20/hour. Plant B produces cars which sell for \$30,000 each and the wages are paid to labourers @\$40/hour. It is assumed that 1,000 labour hours are expended during the measurement period and that the plants both require identical layout of capital and other resources for each unit of production.

Table 1 below summarizes calculations of labour efficiency and productivity for each of the plants:

TABLE 1: Calculation of Efficiency and Productivity (hypothetical)

PLANT A					
Units	Input Hours/\$	Maximum output(Cars)	Actual Output(Cars)	Efficiency=(Maximum Output/Input)	Productivity=(Actual Output/Input)
Physical	1,000	10	8	0.01	0.008
Monetary	20,000	250,000	200,000	12.5	10

PLANT B					
Units	Input Hours/\$	Maximum output(Cars)	Actual Output(Cars)	Efficiency=(Maximum Output/Input)	Productivity=(Actual Output/Input)
Physical	1,000	15	12	0.015	0.012
Monetary	40,000	450,000	360,000	11.25	9.0

A comparative analysis indicates that physical (technical) efficiency of Plant B is higher than that of Plant A, but monetary efficiency of Plant A is higher than that of Plant B. Similarly, physical (technical) productivity of Plant B is higher than that of Plant A, but monetary productivity of Plant A is higher than that of Plant B.

It is to be noted that although labour efficiency and productivity are different concepts, the drivers of labour efficiency and labour productivity overlap. Hence accordingly, the discussion in this report is focused on the dynamics of these drivers in the Canadian context rather than technical differences between the concepts of labour efficiency and labour productivity. The next section reviews trends in Canadian macro level labour productivity relative to other OECD countries.

1.2 Productivity (Macro or Economy Level)

The following exposition on labour productivity at the macro (or economy level) is based on the Organisation for Economic Co-operation and Development (OECD) publication *OECD Compendium of Productivity Indicators 2015*.³

Labour productivity is defined as GDP (Gross Value Added in market prices, based on PPPs <purchasing power parity>) per hour worked. Hours worked reflect regular hours worked by full-time and part-time workers, paid and unpaid overtime, hours worked in additional jobs, and time not worked because of public holidays, annual paid leaves, strikes and disputes, bad weather, and economic conditions.

Labour productivity is a key dimension of economic performance and an essential driver of changes in living standards. Productivity growth is key to improving GDP per capita and hence living standards. In the last fifteen years, differences in GDP per capita growth across OECD countries can be mainly attributed to differences in growth in GDP per hour worked

³ <http://ifuturo.org/documentacion/productivity%20indicators.pdf>
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(labour productivity). In contrast, labour utilisation (hours worked per capita) has hardly changed. Labour productivity growth varies substantially across business sector services. Those services most exposed to international competition and which typically use modern information and telecommunication (ICT) technologies generally had much higher, and more volatile, productivity growth between 1995 and 2013.

Since the mid-1980s, trends in labour productivity growth have varied across G7 countries. Interestingly, indicators suggest that trend labour productivity typically declined since the mid-1990s or early 2000s in G7 countries. After the 2008 financial crisis, labour productivity growth has fallen significantly in most OECD countries and this decline is broadly spread across sectors. Figure 1 below depicts the relative labour productivities of selected OECD countries for 2013.

Understanding how much actual labour productivity growth is driven by structural factors and how much by reactions to the productivity cycle or the economic cycle is hence important for policy makers. This requires decomposing the time series of actual annual labour productivity growth into a trend (or structural) component and a cyclical component.

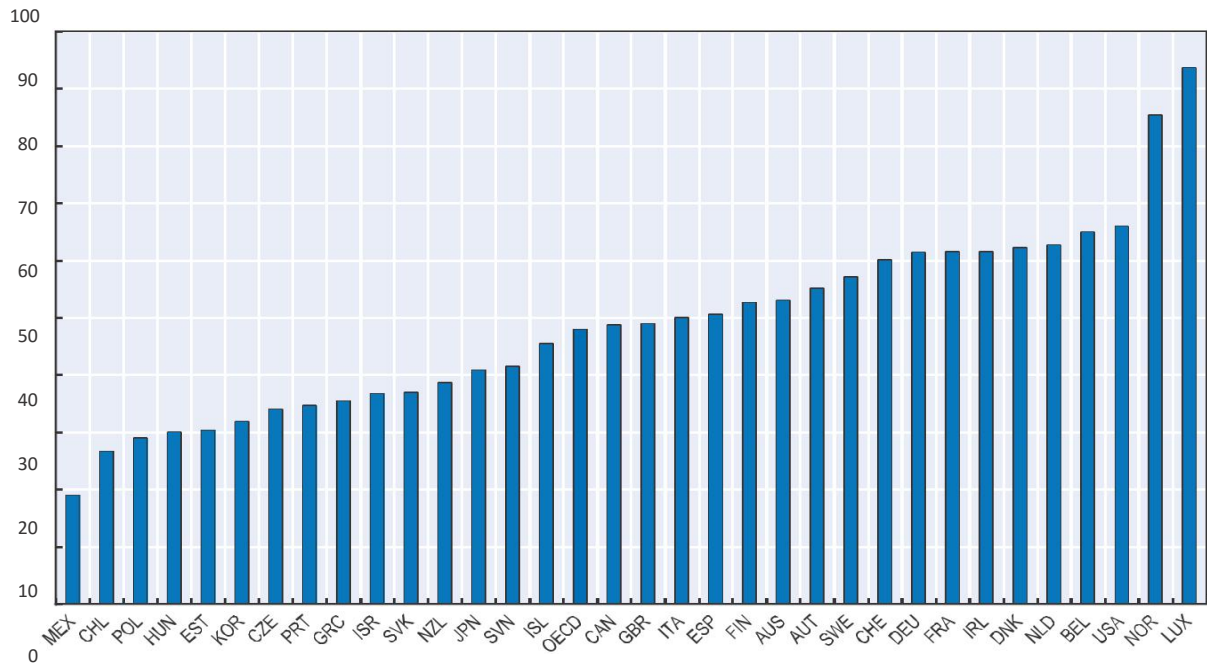
Labour productivity growth has followed different trends across G7 countries. For the 10 years preceding the financial crisis, trend labour productivity growth has declined for nearly all G7 countries, the fall being particularly marked in France, Italy and Japan. In the case of the Canada, the United Kingdom and the United States, the decline since the end-1990s marked some reversal of a previous acceleration. In the other countries, trend labour productivity growth has shown a gradual decline almost throughout the past 30 years, and in the case of Japan, from relatively high rates. Figure 2 below depicts the relative growth in labour productivities of selected OECD countries for the period 1995-2013 and two sub periods (2001-2007 and 2007-2013).

1.3 Wealth of Nations

In today's globalized economy, the wealth of a nation is dependent upon its relative competitiveness. The World Economic Forum (WEF) has developed a comprehensive framework for measuring the competitiveness of an economy (reproduced as Appendix A). Relying on this framework, its publication *Global Competitiveness Report 2016-17*⁴ ranks Canada in 15th place. The explanation for Canada's ranking is reproduced as Appendix B.

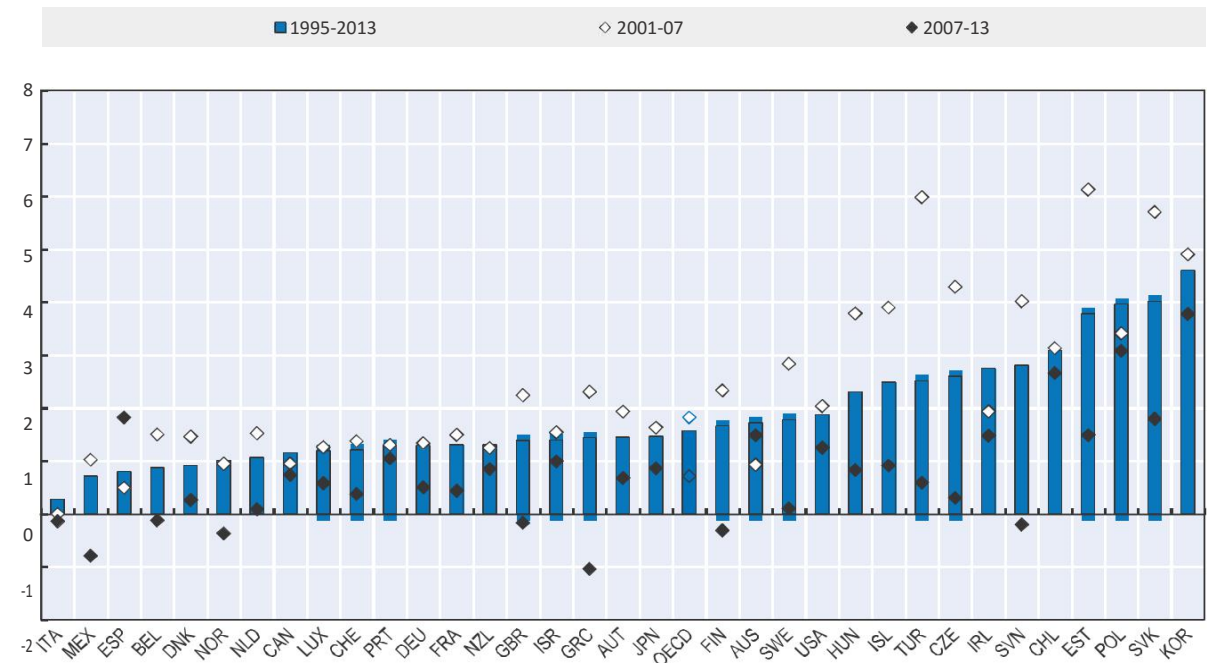
⁴ http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf
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Figure 1: Labour productivity, 2013 - GDP per hour worked, total economy, US \$, current prices and PPPs



Source: OECD Compendium of Productivity Indicators 2015

Figure 2: Growth in labour productivity - GDP per hour worked, total economy, % change at annual rate



Source: OECD Compendium of Productivity Indicators 2015

2. Profile of Canada's Labour Force

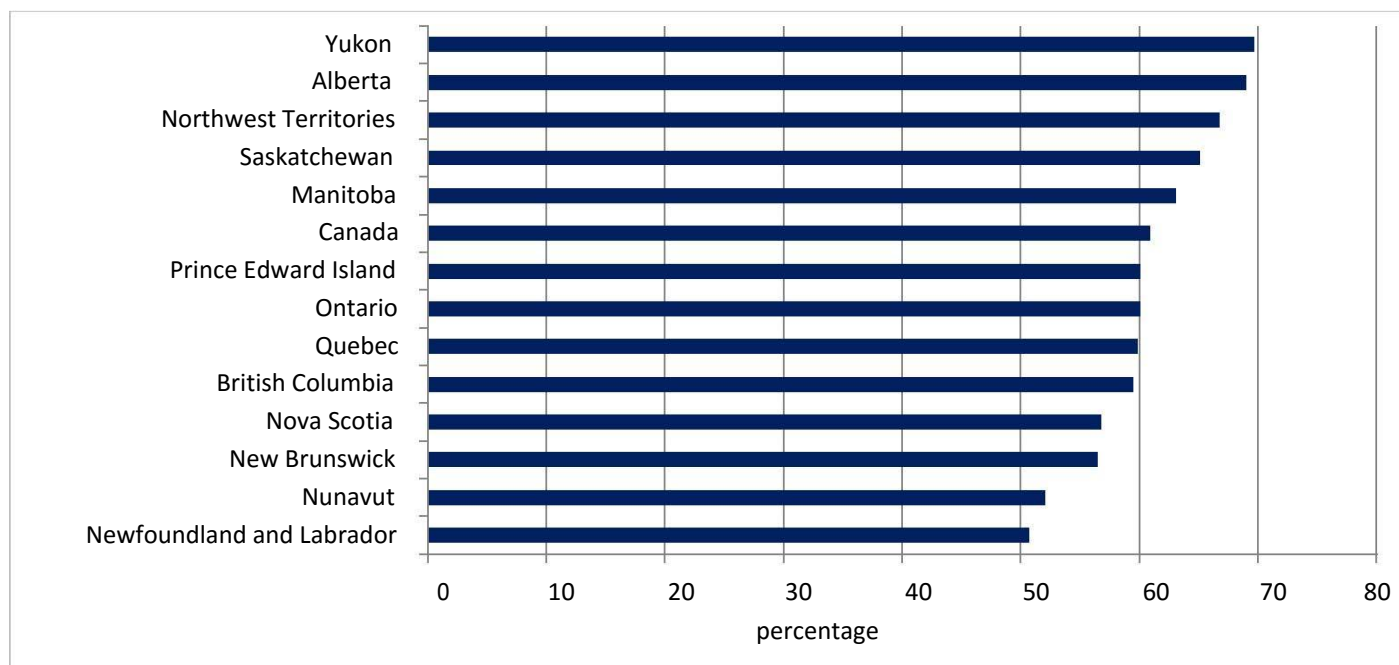
The following highlights portray Canada's labour force based on the 2011 Census Program⁵. The Census Program 2016 release is expected to begin in February, 2017.⁶

2.1 Employment

According to the National Household Survey (NHS), Canada had 17,990,080 people aged 15 years and over in the labour force during the week of Sunday, May 1 to Saturday, May 7, 2011. Of these labour force participants, 16,595,035 were employed, and the employment rate (number of persons employed expressed as a percentage of the total population aged 15 years and over) was 60.9%. In comparison, at the time of the 2006 Census, 15,958,195 were employed and the employment rate was 62.6%.

In 2011, Yukon and Alberta had the highest employment rates in Canada, at 69.7% and 69.0% respectively. Employment rates were also above the national average in the Northwest Territories (66.8%), Saskatchewan (65.1%) and Manitoba (63.1%). The lowest employment rates were observed in Newfoundland and Labrador and in Nunavut at 50.7% and 52.1% respectively (Figure 3).

Figure 3: Employment rate of the population aged 15 years and over (percentage), May 2011



Source: Statistics Canada, National Household Survey, 2011.

Among all census metropolitan areas (CMAs), Calgary had the highest employment rate at 70.0%, followed by Regina (69.1%) and Edmonton (69.0%). The lowest employment rates were observed in Windsor (53.3%), Peterborough (55.8%) and Trois-Rivières (55.9%).

⁵ <http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/99-012-x2011002-eng.pdf>

⁶ <http://www12.statcan.gc.ca/census-recensement/2016/ref/release-dates-diffusion-eng.cfm>

2.2 Employment Rate and Education Level

In 2011, the employment rate for the population aged 25 to 64 years was 75.3%. Within this group, 30.8% held university credentials while 12.7% held no certificate, diploma or degree. In general, the employment rate increases with education level. The employment rate for those having university credentials held at 81.6% compared to 55.8% for those having no certificate, diploma or degree (Table 2).

In 2011, Nunavut (93.0%), the Northwest Territories (90.3%) and the Yukon (86.4%) had the highest employment rates for those with a university education. The lowest rates were observed in Newfoundland and Labrador and British Columbia, both at 79.2%. For those with a college degree, the employment rates ranged from 84.4% in Saskatchewan to 74.8% in Newfoundland and Labrador. For those with a trade certificate, the highest employment rates were in Alberta (84.6%), Saskatchewan (84.2%) and Manitoba (80.6%), while the lowest rates were found in Newfoundland and Labrador (66.9%) and Nunavut (68.9%). Among those with a high school diploma as their highest level of educational attainment, employment rates ranged from 80.4% in the Northwest Territories to 58.6% in Newfoundland and Labrador. For those with no certificate, diploma or degree, Alberta had the highest employment rate at 67.5%, followed by Saskatchewan at 61.8%. The lowest rates were in Newfoundland and Labrador (39.7%) and Nunavut (45.1%).

Table 2: Employment by Highest level of educational attainment, May 2011

Provinces/territories	No certificate, diploma or degree	Secondary (high) school diploma or equivalent	Apprenticeship or trades certificate or diploma	College, CEGEP or other non-university certificate or diploma	University certificate, diploma or degree	Total for 25 to 64 years
Newfoundland and Labrador	39.7	58.6	66.9	74.8	79.2	63.9
Prince Edward Island	59.7	72.9	77.1	80.4	80.6	75.3
Nova Scotia	50.6	68.1	72.0	77.2	81.0	71.7
New Brunswick	47.8	68.6	72.2	78.7	82.4	70.8
Quebec	53.9	69.1	77.8	81.8	81.8	74.5
Ontario	54.7	70.7	76.2	80.3	81.3	75.2
Manitoba	60.3	76.6	80.6	82.2	84.3	77.4
Saskatchewan	61.8	79.1	84.2	84.4	84.6	79.5
Alberta	67.5	77.8	84.6	82.9	84.4	80.5
British Columbia	56.1	70.7	76.8	77.9	79.2	74.2
Yukon	61.1	79.6	78.0	78.9	86.4	79.1
Northwest Territories	51.0	80.4	78.0	84.3	90.3	77.1
Nunavut	45.1	73.2	68.9	77.9	93.0	63.6
Canada	55.8	71.4	77.8	80.6	81.6	75.3

Source: Statistics Canada, National Household Survey, 2011.

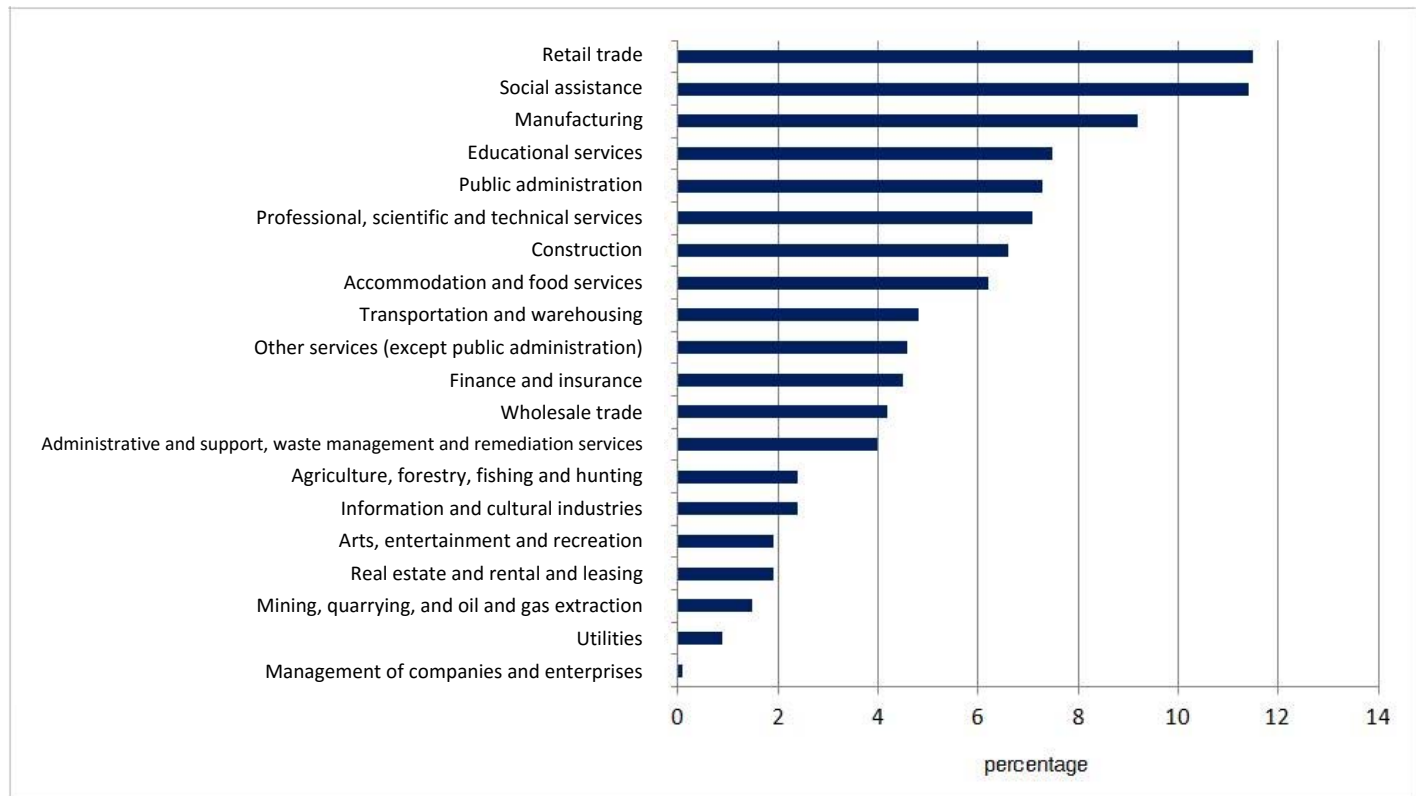
2.3 Employment by Industrial Sector

Retail trade sector had the highest share of total employment

In 2011, the retail trade sector ranked first among all sectors in terms of its share of total employment with 11.5% (Figure 4), accounting for 1,907,605 workers. This was followed closely by the health care and social assistance sector holding 11.4% of total employment, or 1,886,980 workers.

The manufacturing sector had the third highest share with 9.2% of total employment or 1,525,400 workers. This was followed by the educational services sector (7.5%) and the public administration sector (7.3%), accounting for 1,247,050 and 1,212,070 workers respectively.

Figure 4: Proportion of the employed population aged 15 years and over, by industrial sector, May 2011

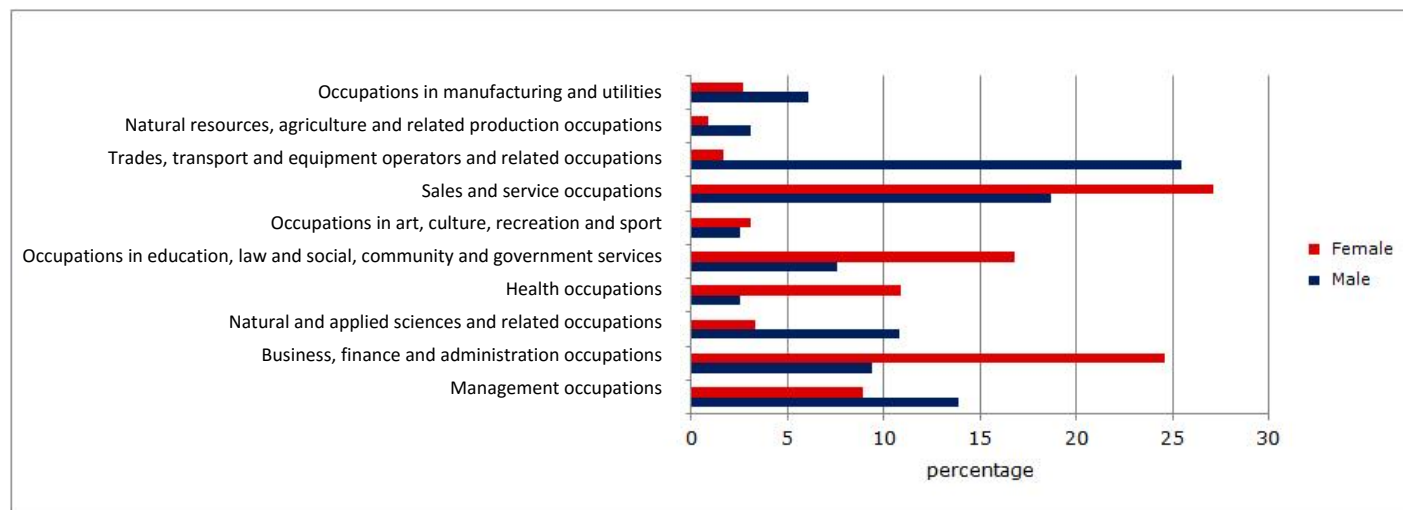


Source: Statistics Canada, National Household Survey, 2011.

2.4 Occupations among Women and Men

In 2011, women comprised slightly less than half of the employed labour force (48.0%). Among the 10 broad occupational categories, women aged 15 years and over were most likely to be employed in sales and service occupations (27.1%); business, finance and administration occupations (24.6%); and occupations in education, law and social, community and government services (16.8%) (Figure 5). In comparison, men were most likely employed in trades, transport and equipment operators and related occupations (25.5%); sales and service occupations (18.7%); and management occupations (13.9%).

Figure 5: Distribution of the employed population by major occupational groups, men and women aged 15 years and over, May 2011



Source: Statistics Canada, National Household Survey, 2011.

The 2011 NHS also provides the distribution of workers across 500 detailed occupations. The 20 most common occupations for women accounted for 45.8% of their total employment. In comparison, 30.1% of men worked in their 20 most common occupations.

The most common occupations for women were retail salesperson and administrative assistant

Among the detailed occupations, the most common occupation for women was retail salesperson (accounting for 4.7% of all employed women), followed by administrative assistant (4.0%), registered nurse and registered psychiatric nurse (3.4%), cashier (3.3%) and elementary school and kindergarten teacher (2.9%) (Table 3).

Among the 20 most common occupations for women, women accounted for more than 9 out of 10 workers performing the work of: administrative assistant; registered nurse and registered psychiatric nurse; early childhood educator and assistant; and receptionist.

The most common occupations for men were retail salesperson and truck driver

Among the detailed occupations, the most common occupation for men was retail salesperson (accounting for 3.3% of all employed men), followed by transport truck driver (2.9%), retail and wholesale trade manager (2.5%), carpenter (1.7%) and janitor, caretaker and building superintendent (1.7%) (Table 4).

Among the 20 most common occupations for men, men accounted for more than 9 out of 10 workers in: transport truck driver; carpenter; automotive service technician, truck and bus mechanic and mechanical repairer; construction trades helper and labourer; welder and related machine operator; electrician; and delivery and courier service driver.

Table 3: The 20 most common occupations among women aged 15 years and over and the share of women in the total workforce, May 2011

Occupations minor group among women	Number	Percentage distribution	Proportion of women among all (15 years and over)
All occupations	7,960,720	100.0	48.0
All of the 20 most common occupations	3,643,410	45.8	74.4
Retail salespersons	371,345	4.7	56.6
Administrative assistants	316,565	4.0	96.3
Registered nurses and registered psychiatric nurses	270,425	3.4	92.8
Cashiers	260,190	3.3	84.2
Elementary school and kindergarten teachers	227,810	2.9	84.0
Administrative officers	201,320	2.5	81.5
Food counter attendants, kitchen helpers and related support occupations	200,695	2.5	64.2
General office support workers	184,720	2.3	84.4
Early childhood educators and assistants	181,705	2.3	96.8
Nurse aides, orderlies and patient service associates	166,440	2.1	85.7
Retail and wholesale trade managers	151,605	1.9	41.7
Light duty cleaners	150,800	1.9	70.6
Receptionists	146,025	1.8	94.0
Food and beverage servers	142,400	1.8	78.8
Accounting and related clerks	121,160	1.5	85.1
Other customer and information services representatives	119,970	1.5	64.2
Accounting technicians and bookkeepers	117,050	1.5	87.3
Financial auditors and accountants	112,300	1.4	55.2
Secondary school teachers	101,960	1.3	58.6
Social and community service workers	98,925	1.2	76.9

Source: Statistics Canada, National Household Survey, 2011.

Table 4: The 20 most common occupations among men aged 15 years and over and the proportion of men in the total workforce, May 2011

Occupations minor group among men	Number	Proportion of men among all Percentage (15 years distribution and over)	
All occupations	8,634,310	100.0	52.0
All of the 20 most common occupations	2,601,425	30.1	67.5
Retail salespersons	285,050	3.3	43.4
Transport truck drivers	253,385	2.9	96.8
Retail and wholesale trade managers	211,685	2.5	58.3
Carpenters	146,550	1.7	98.1
Janitors, caretakers and building superintendents	145,510	1.7	74.4
Material handlers	138,435	1.6	87.6
Automotive service technicians, truck and bus mechanics and mechanical Repairers	135,350	1.6	98.4
Managers in agriculture	126,425	1.5	75.2
Construction trades helpers and labourers	125,955	1.5	93.9
Food counter attendants, kitchen helpers and related support occupations	112,125	1.3	35.8
Cooks	110,185	1.3	57.2
Information systems analysts and consultants	105,755	1.2	72.0
Store shelf stockers, clerks and order fillers	100,190	1.2	66.5
Financial auditors and accountants	91,170	1.1	44.8
Shippers and receivers	90,130	1.0	77.6
Sales and account representatives - wholesale trade (non-technical)	86,560	1.0	66.0
Welders and related machine operators	85,705	1.0	96.0
Electricians (except industrial and power system)	84,480	1.0	98.1
Security guards and related security service occupations	84,330	1.0	76.9
Delivery and courier service drivers	82,450	1.0	91.5

Source: Statistics Canada, National Household Survey, 2011.

2.5 Aging of the Workforce

Almost one in five workers were aged 55 years and over

According to the 2011 NHS, workers aged 55 years and over accounted for 18.7% of total employment compared to 15.5% in the 2006 Census. This is the result of the aging of the baby boom generation and the increased participation of older workers in the labour force.

The NHS 2011 also refers to the data from the Organization for Economic Co-operation and Development (OECD). As per this data, the proportion of workers aged 55 years and over in Canada was similar to those of other G8 countries such as Germany (17.9%) and the United Kingdom (17.4%). This proportion was lower than that of the United States (20.7%) and Japan (27.1%), but higher than that of Russia (12.6%), France (13.7%) and Italy (14.1%).

In 2011, just over 3 million people aged 55 years and over were employed. The employment rate for this age group was 34.9% compared to 32.2% in the 2006 Census.

Table 5: Occupations¹ with the highest proportion of workers aged 55 years and over, May 2011

Occupation minor group	Employment level	Proportion of workers aged 55 years and over
	number	percentage
Managers in agriculture	168,020	49.0
Professional occupations in religion	30,610	40.2
Bus drivers, subway operators and other transit operators	85,130	39.6
Survey interviewers and statistical clerks	36,060	39.3
Taxi and limousine drivers and chauffeurs	48,545	38.0
Real estate agents and salespersons	61,700	37.8
Property administrators	49,940	37.3
Senior managers – health, education, social and community services and membership organizations	25,300	34.7
Senior managers – construction, transportation, production and utilities	54,710	32.9
Psychologists	21,535	32.4

1. Top 10 occupations with at least 20,000 workers.

Source: Statistics Canada, National Household Survey, 2011.

Among the occupations with at least 20,000 workers, the occupations with the highest proportion of workers aged 55 years and over were (Table 5) manager in agriculture (49.0%), professional occupation in religion (40.2%), bus driver, subway operator, and other transit operator (39.6%).

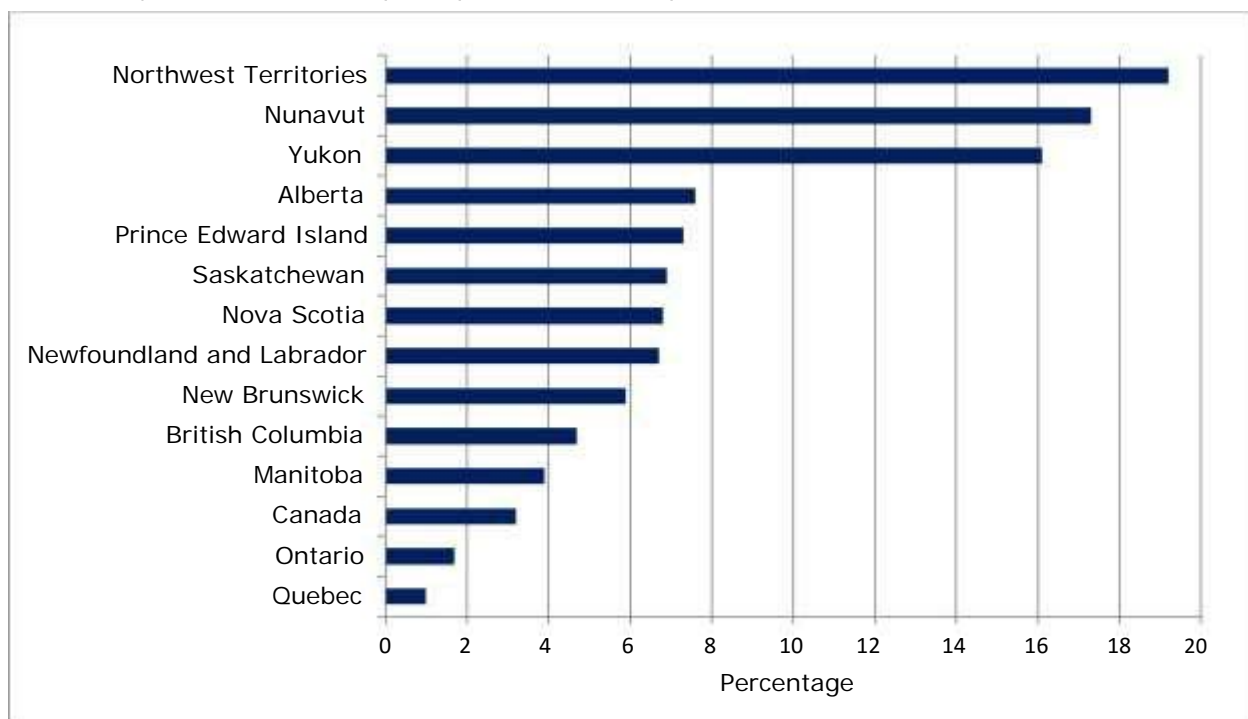
2.6 Mobility of the Workforce

In 2011, 516,475 workers, or 3.2% of the employed population aged 15 years and over, lived in a different province or territory five years earlier (Figure 6).

The Northwest Territories had the highest proportion of workers in 2011 who lived in another province or territory 5 years earlier (19.2%), followed by Nunavut (17.3%) and the Yukon (16.1%).

Among the provinces, Alberta (7.6%) and Prince Edward Island (7.3%) had the largest proportions of workers in 2011 living in another province or territory five years earlier, while Québec (1.0%) and Ontario (1.7%) had the lowest.

Figure 6: Proportion of the employed population aged 15 years and over who lived in another province or territory five years earlier, May 2011



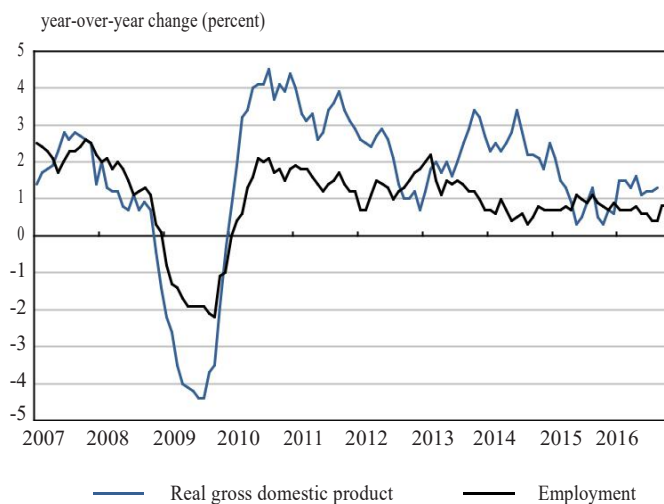
Source: Statistics Canada, National Household Survey, 2011.

2.7 Recent Developments

Employment rose by 44,000 individuals in the first six months of 2016 on gains in part-time work and in services. Employment increased a further 62,000 in the third quarter, again counting on expansion in part-time work. Despite lower output in the second quarter, employment growth, measured year-over-year, continued to lag output growth during the first half of 2016 (Figure 7).⁷

In summary, the 2011 Canadian labour force was aging and almost one in five workers was aged 55 years or older. The employment level expressed as a percentage of the total population aged 15 years and over was trending downwards (60.9% in 2011 versus in 62.6% 2006). The employment level increased with education level but there was a gender based disparity in the major occupation groups in which men and women worked. The most common occupations for men were retail salesperson and truck driver while the most common occupations for women were retail salesperson and administrative assistant. There was considerable mobility among workers and the general direction of migration was from eastern and southern provinces to northern and western jurisdictions. Recent developments indicate that employment growth lags output growth.

Figure 7: Output and employment (2007-2016)



Sources: Statistics Canada, CANSIM tables 282-0087 and 379-0031.

⁷ <http://www.statcan.gc.ca/pub/11-626-x/11-626-x2016061-eng.pdf>
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3. Canada's Human Resources: Drivers of Productivity

Efficiently deployed productive human resources are of paramount significance in building the wealth of a nation. The most influential drivers of productivity are **Institutions, Innovation, Infrastructure, Investment, Health, Education and Job Satisfaction**. The following sections describe these drivers in the Canadian context based on the information available in public domain.

3.1 Institutions

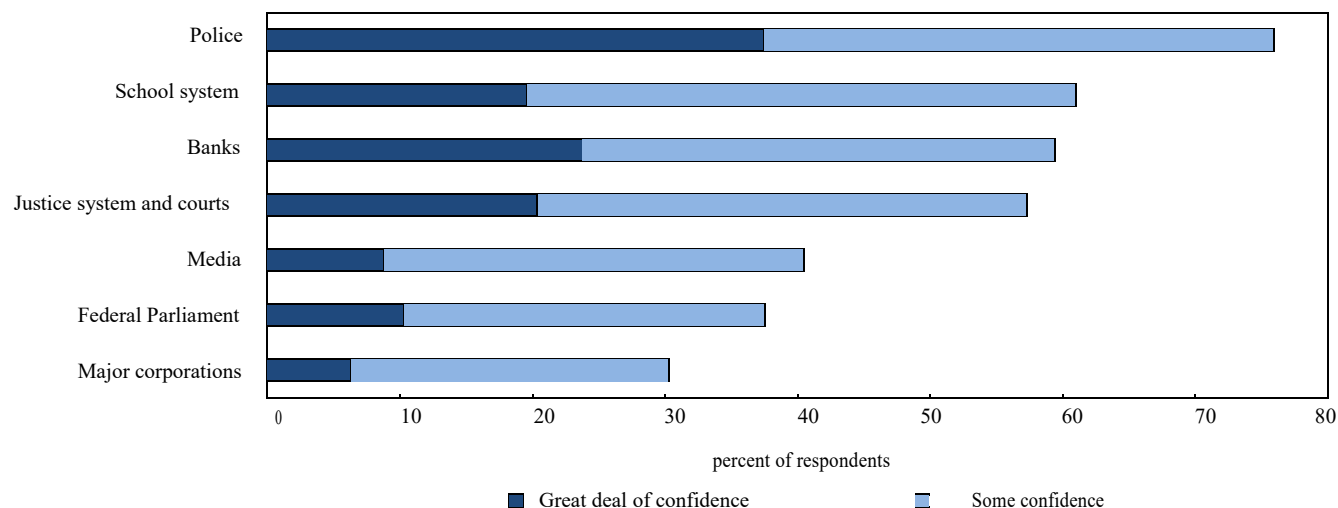
Public and private institutions directly influence efficiency and productivity of labour. It is generally accepted that transparent and ethical institutions enhance efficiency and productivity while excessive cost of regulatory compliance inhibit them. The following highlights and Figure 8 extracted from the *General Social Survey on Social Identity 2013*⁸ illustrate Canadians' sentiments in relation to our domestic institutions:

- Three in four Canadians (76%) have either a great deal or some confidence in the police, making it the institution with the highest level of public confidence. Next highest were the school system (61%), banks (59%), and the justice system and courts (57%). Fewer than half of Canadians expressed confidence in the media (40%), Federal Parliament (38%), or major corporations (30%).
- Women and older Canadians generally had the highest levels of confidence in government and institutions, with a few notable exceptions. There was no gender difference in views on the media, while younger Canadians, those aged 15 to 24 years, had the greatest confidence in Federal Parliament.
- Overall confidence in institutions was highest among visible minorities and immigrants, particularly among those who immigrated to Canada since 2000.
- Aboriginal people were less likely than non-Aboriginal people to have high levels of confidence in institutions, though they were equally as likely to say that they had a great deal or some confidence in banks and major corporations.
- Residents of Newfoundland and Labrador and of New Brunswick tended to have above-average confidence in most institutions, while residents of Québec and British Columbia tended to have below-average confidence in institutions. Confidence was generally highest in the census metropolitan area (CMA) of Toronto, and lowest in the Québec CMAs of Montréal and Sherbrooke.

It can be generally concluded that public confidence in domestic institutions is high.

⁸ <http://www.statcan.gc.ca/pub/89-652-x/89-652-x2015007-eng.pdf>
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Figure 8: Confidence in Canadian institutions, 2013



Note: Responses of don't know/not stated are excluded from the calculation of percentages.
Source: Statistics Canada, General Social Survey on Social Identity, 2013.

The efficiency and productivity of labour is also impacted by the burden of regulations and costs of complying with them. Statistics Canada and Industry Canada conducted in 2011 a *Survey of Regulatory Compliance Costs (SRCC)*⁹. The data were collected from 10,477 respondents representing small and medium-sized enterprises (SMEs) in Canada. Following is a summary of findings reproduced from this report:

The real cost of regulatory compliance to Canadian SMEs (adjusting for inflation and growth in the size of the business sector) was \$4.76 billion in 2011. This amounted to approximately \$3,500 per business and \$370 per employee, or 0.29 percent of business sector revenues. As a share of economic resources, the cost of regulatory compliance fell from 0.81 percent of SME gross domestic product (GDP) in 2005 to 0.75 percent of SME GDP in 2011. The real cost of regulatory compliance has decreased by 0.3 percent per year since 2005.

The findings also showed that, although 6 percent of SMEs considered regulatory compliance as a serious obstacle to success, most SMEs (72 percent), did not consider it to be even a moderate obstacle.

The data included information on the quantity of regulatory paperwork faced by Canadian SMEs and the amount of time spent on compliance. The analysis revealed that Canadian SMEs submit, on average, two government forms to regulators per month, which takes them, on average, three hours per month to complete, or less than an hour per week.

Businesses consider the paperwork stemming from federal regulations to be the most time consuming, with tax-related requirements representing the biggest challenge. Since 2005 however, paperwork stemming from federal regulations also represents an area in which

⁹ [http://www.reducingpaperburden.gc.ca/eic/site/pbri-iafp.nsf/vwapj/09-2013_eng.pdf/\\$file/09-2013_eng.pdf](http://www.reducingpaperburden.gc.ca/eic/site/pbri-iafp.nsf/vwapj/09-2013_eng.pdf/$file/09-2013_eng.pdf)

significant regulatory compliance cost reduction efforts have been made (e.g., simplification of forms, availability of electronic filing). Electronic processing methods are being increasingly adopted by those SMEs that continue to carry out their regulatory compliance activities in-house. At the same time, there has been a high rate of substitution from in-house compliance to outsourcing between 2008 and 2011.

Small businesses continue to bear a disproportionate share of the national burden of regulatory compliance. However, the SRCC data also show that this burden does not fall most heavily on the smallest of businesses (i.e., non-employer businesses). This finding supports the hypothesis that the regulatory compliance burden initially increases as a firm grows and hires employees before decreasing once certain economies of scale are achieved.

About 65 percent of companies indicated that the cost of regulatory compliance was at an acceptable level in 2011, with only 8.5 percent reporting that the cost was at a much higher than acceptable level. That said, Canadian businesses still want action taken to reduce regulatory compliance costs, with the majority of firms affirming that doing so should constitute a moderate to high priority for the federal government.

Hence it can be concluded that although there is a prospect for further improvement, regulatory burden is not typically deemed to be a serious impediment to labour efficiency and productivity in Canada.

3.2 Innovation

The mechanisms at the root of technological change and the engines of labour productivity growth are related to the different strategies pursuing either technological competitiveness (such as innovation in products and markets) or cost competitiveness. Although these strategies may coexist in firms and industries, each industry is characterised by the dominance of either technological or cost competitiveness. These two strategies affect economic performance in fundamentally different ways.

Both technological and cost competitiveness strategies have contributed to better economic performance, operating through radically different mechanisms. However, only Science-Based industries that have heavily invested in both, can show rapid productivity increases. Moreover, a parallel expansion of demand and an adequate qualification of workers represent additional key factors for explaining labour productivity performances across all industries.

Policies aiming at greater productivity growth may have to take into account the different mechanisms resulting from technological and cost competitiveness strategies, and the different relevance correlations that they have within industry groups. Innovation policies could also develop a stronger relational integration with industrial and macroeconomic policies.

3.2.1 Research and Development Personnel, by Performing Sector

There were 226,620 full-time equivalent personnel working in research and development (R&D) in Canada in 2013, down 2.0% from 2012 (Table 6). The overall decrease in R&D personnel was largely attributable to the business enterprise sector.

Every performing sector except higher education (+ 4.8%) and private non-profit organizations (+ 4.3%) recorded a decline in R&D personnel in 2013.

The business enterprise sector (58.4%) continued to account for the largest share of total R&D full-time equivalents in 2013, followed by the higher education (33.0%) and federal government (6.8%) sectors.

All occupational categories posted declines in the number of R&D full-time equivalents in 2013: support staff (-4.2%), technicians (-2.7%) and researchers (-1.5%).

There were fewer R&D personnel in seven provinces in 2013, with Ontario and Québec contributing the most to the overall decline. These decreases were partially offset by gains in Alberta, Saskatchewan and Manitoba.

Table 6: Research and development personnel, by performing sector (2009-2013)

	2009	2010	2011 ^r	2012 ^r	2013	2012 to 2013
	number of full-time equivalents					% change
Total, performing sectors	236,760	233,060	239,920	231,230	226,620	-2.0
Business enterprises	155,180	144,270	148,930	139,460	132,330	-5.1
Higher education	60,180	67,590	70,010	71,320	74,730	4.8
Federal government	17,280	17,080	16,960	16,290	15,480	-5.0
Provincial governments	2,880	2,800	2,780	2,780	2,630	-5.4
Private non-profit organizations	1,240	1,300	1,240	1,390	1,450	4.3

^r revised

Source(s): CANSIM table 358-0159.

Canada's gross domestic expenditures on research and development (GERD) are expected to decline for a third consecutive year, down 0.7% from 2014 to \$31.6 billion in 2015.

Table 7: Research and development spending intentions, by performing sector (2014-2015)

	2014	2015	2014 to 2015
	millions of dollars		% change
Total, performing sectors	31,825	31,604	-0.7
Business enterprises	15,877	15,462	-2.6
Higher education	12,860	12,988	1.0
Federal government	2,602	2,679	3.0
Provincial governments and provincial research organizations	326	317	-2.8
Private non-profit	160	158	-1.2

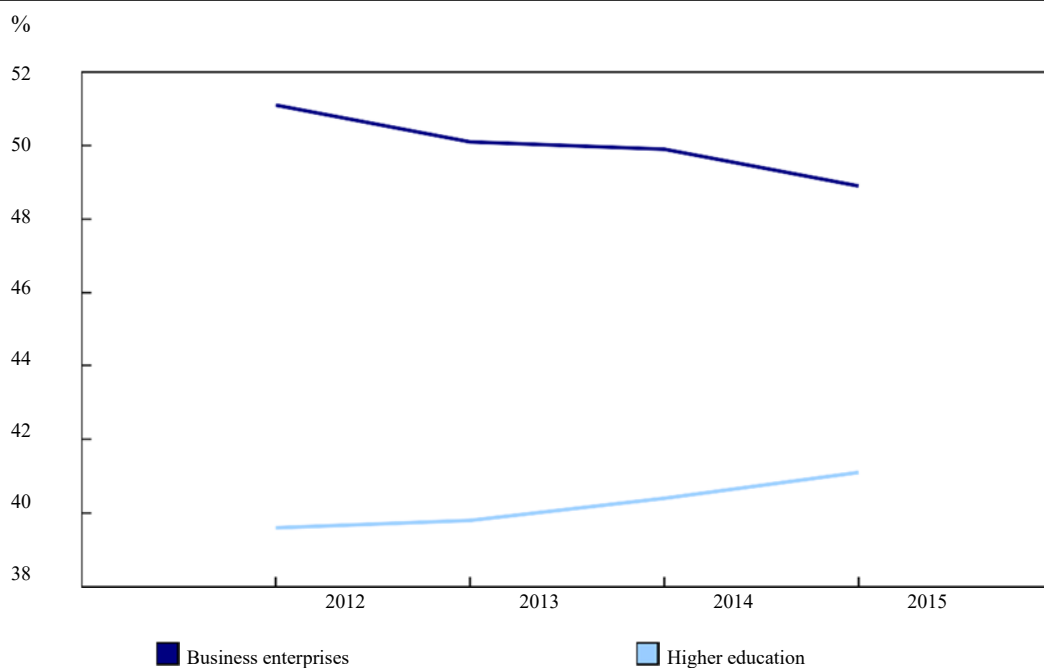
Note(s): Components may not add up to totals because of rounding.

Source(s): CANSIM table 358-0001.

Performing sectors decrease their spending on research and development

In 2015, all performing sectors anticipated declines in research and development (R&D) spending, except for the higher education and federal government sectors, which expected to increase their R&D expenditures (Table 7). The business enterprise sector was forecast to spend \$15.5 billion on R&D, down 2.6% from the previous year. This sector has historically been the largest performing sector of GERD. Although the sector was expected to account for 48.9% of GERD in 2015, it has recorded annual declines in R&D expenditures in recent years. The higher education sector—the second largest GERD performing sector—anticipated spending \$13.0 billion in R&D, up 1.0% from 2014. In 2015, this sector was expected to account for 41.1% of GERD among performing sectors. Overall, the business enterprise and higher education sectors were expected to incur 90.0% of R&D expenditures in 2015 (Figure 9). The federal government sector expected to increase its R&D spending by 3.0% to \$2.7 billion.

Figure 9: R&D¹ expenditures by the two largest performing sectors as a percentage of GERD² (2012-2015)



1. Research and development.

2. Gross domestic expenditures on research and development.

Source(s): CANSIM table 358-0001.

3.2.2 Research and Development Expenditures by Funding Sector

The business enterprise sector was expected to decrease its R&D funding by 2.8% from 2014 to \$14.0 billion in 2015. Despite the decrease in funding, the sector remained the largest funder of R&D in Canada, accounting for 44.4% of total R&D funding. The next largest funding sectors, higher education and federal government, were anticipated to represent 20.2% and 19.6% of total R&D funding in 2015 respectively (Table 8).

Table 8: Research and development spending intentions, by funding sector (2014-2015)

	2014	2015	2014 to 2015
	millions of dollars		% change
Total, funding sectors	31,825	31,604	-0.7
Business enterprises	14,445	14,042	-2.8
Higher education	6,311	6,374	1.0
Federal government	6,087	6,199	1.8
Foreign	1,914	1,907	-0.4
Provincial governments and provincial research			
Organizations	1,889	1,891	0.1
Private non-profit	1,180	1,191	0.9

Note(s): Components may not add up to totals because of rounding.

Source(s): CANSIM table 358-0001.

The higher education sector was expected to increase R&D funding by 1.0% to \$6.4 billion, while the federal government sector anticipated an increase of 1.8% to \$6.2 billion.

Lower spending on research and development in the natural sciences and engineering field¹⁰

R&D expenditures in natural sciences and engineering were expected to be \$28.3 billion in 2015, down 0.8% from 2014. This was the third consecutive annual decrease in R&D spending in the science field. The decrease is largely attributable to lower spending by the business enterprise sector. It should be noted that all R&D expenditures in the business enterprise sector—the largest performing R&D sector—are undertaken in the natural sciences and engineering field. R&D spending in social sciences and humanities were expected to be virtually unchanged at \$3.3 billion in 2015 when compared with 2014. More than 90% of R&D expenditures in this science field are performed by the higher education sector.

¹⁰ <http://www.statcan.gc.ca/daily-quotidien/150923/dq150923b-eng.pdf>

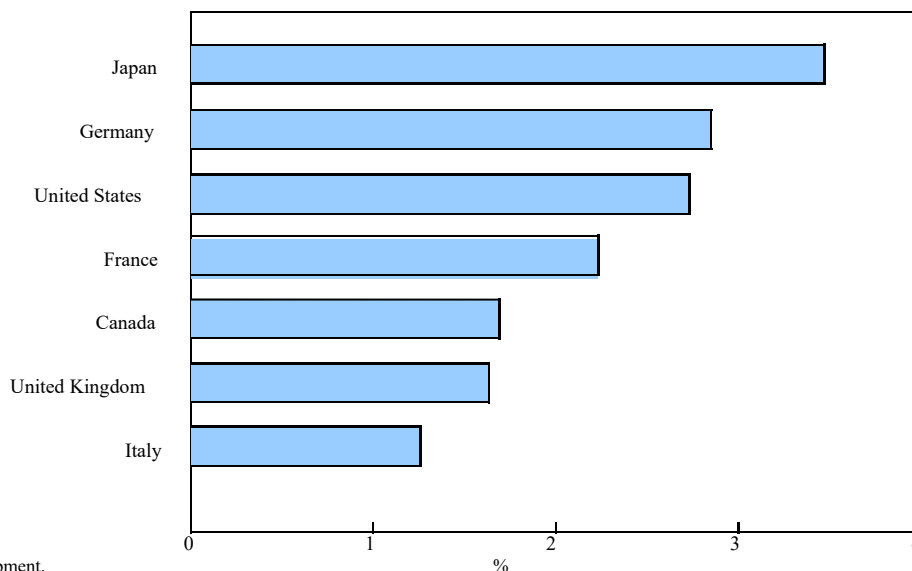
3.2.3 Canada's Research and Development Performance: A 2013 International Perspective

Internationally, a country's GERD as a percentage of its gross domestic product (GDP) is considered an indicator of the country's degree of R&D intensity and is a commonly used summary statistic in international comparisons. This statistic is also compared with GERD and GDP per capita as it is influenced by a nation's economic and demographic structure, as well as its propensity to perform R&D in certain sectors.

The Organization for Economic Co-operation and Development (OECD) publishes international statistics on R&D as part of its Main Science and Technology Indicators. According to the OECD's most recently published data, the OECD average ratio of GERD to GDP in 2013 was 2.36. Israel had the highest ratio at 4.21, followed by South Korea at 4.15 and Japan at 3.47.

In 2013, Canada's ratio of R&D spending as a percentage of GDP was 1.69, down from 1.79 in 2012. Among G7 countries, Canada ranked fifth in 2013 (Figure 10).

Figure 10: Gross domestic expenditures in R&D¹ as a percentage of GDP, ² by G7 country, 2013



1. Research and development.

2. Gross domestic product.

Source(s): Statistics Canada, CANSIM tables 358-0001, 380-0064 and 380-0102; Organisation for Economic Co-operation and Development, Main Science and Technology Indicators, Volume 2015/1

The Conference Board of Canada center for Business Innovation has suggested the following measures to facilitate innovation in Canada:

- Expand the pool of risk capital in Canada.
- Strengthen business-Public Sector Enterprises links to improve innovation results.
- Reform tax and incentive support for anchor companies and SMEs for research and development.
- Use tax relief and fiscal incentives to drive meaningful innovation.
- Clarify and harmonize Canada's intellectual property regime.
- Tap private-sector expertise in setting up policies and programs aimed at enhancing Canadian industry performance while spending public funds.
- Enhance government procurement and investment in early stage innovation.
- Launch a National Innovation Management and Commercialization Training Initiative.
- Seek out the best and brightest international talent.
- Nurture and strengthen city and regional innovation clusters.
- Promote the establishment and use of metrics to measure performance and to manage innovation inside the firm.

It is evident that lack of innovation is a serious impediment to the growth of Canadian labour efficiency and productivity. The performance in this sector can be described as dismal on the basis of domestic trends as well as international perspectives. A dynamic and strategic policy response is urgently required for enabling Canada to assume a leadership position in this very critical sector of economy.

3.3 Infrastructure

Public infrastructure capital stock includes highways and other transportation facilities including docks and ports, water treatment and distribution systems, public safety systems such as police and fire protection, collection, and disposal of garbage, sewage treatment and other public utilities. Public infrastructure provides the necessary environment for production to occur and enhances productivity, particularly of labour.

The scorecard for Canadian infrastructure benchmarked internationally is reproduced below (Table 9) from *The Global Competitiveness Report 2016-17*¹¹ produced by *the World Economic Forum*

¹¹ http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf
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Table 9: Scorecard for Canadian Infrastructure (2016-2017)

		Rank / 138	Value
2nd pillar: Infrastructure		15	5.7
2.01	Quality of overall infrastructure	21	5.2
2.02	Quality of roads	22	5.3
2.03	Quality of railroad infrastructure	18	4.8
2.04	Quality of port infrastructure	19	5.4
2.05	Quality of air transport infrastructure	16	5.8
2.06	Available airline seat kilometers millions/week	11	3831.3
2.07	Quality of electricity supply	16	6.5
2.08	Mobile-cellular telephone subscriptions /100 pop.	119	81.9
2.09	Fixed-telephone lines /100 pop.	14	44.3

Source: The Global Competitiveness Report 2016-17 produced by the *World Economic Forum*

The report clearly indicates that in so far as infrastructure is concerned, Canada is not in the top league.

Increasingly, in Canada, the jurisdictional responsibility for funding much of public infrastructure has been shifted to the local or municipal level. A strong argument can be made that it is efficient to have public infrastructure facilities under the jurisdiction of local authorities, so that local people can decide on what public infrastructure is most pressing and desirable. However, since local revenue sources have not kept pace with the expenditure requirements, the result has been a tendency to allow existing public infrastructure to deteriorate. The Canadian Infrastructure Report Card for 2016¹² highlights the deficiency in infrastructure on the basis of a survey of municipalities as follows:

“One-third of our municipal infrastructure is in fair, poor or very poor condition, increasing the risk of service disruption. The survey asked municipalities to qualitatively assess their infrastructure according to a five-point rating scale ranging from Very Good to Very Poor. Nearly 35% of assets are in need of attention. Assets in fair, poor and very poor conditions represent a call for action. Survey results demonstrate that roads, municipal buildings, sport and recreation facilities and public transit are the asset classes most in need of attention.”

There is clear evidence that Canada needs to upgrade its infrastructure on an urgent basis to remain competitive in a globalized economy. Investment in this sector will yield multiple dividends through increased productivity and efficiency of labour and through other factors of production that are likewise enabled through infrastructure

¹² <http://canadianinfrastructure.ca/en/index.html>
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improvement. The stated intention of the present government is to jumpstart the economy by investing in infrastructure projects. This thinking is in the right direction.

3.4 Investments

Investment is widely recognized as essential to improving labour efficiency and productivity. Investment in physical capital, and specifically machinery and equipment (M&E), is associated with the adoption and diffusion of the latest technologies—key to growth in labour productivity. By investing in M&E, workers are equipped with the latest technologies, which, in turn, allow them to improve their business processes and to produce more and higher-quality goods and services.

Similarly, investment in information and communications technology (ICT) has a high positive correlation with labour efficiency and productivity.

However, Canada's investment in M&E and ICT as a share of GDP is among the lowest of its peers in OECD countries. This gap largely accounts for a good proportion of the labour productivity gap between Canada and other OECD countries. A recent report in Statistics Canada's newsletter, *The Daily*¹³, documents this weakness. Excerpts:

- Public and private sector organizations anticipate spending \$241.6 billion on non-residential capital construction and machinery and equipment in 2016, down 4.4% from 2015, the second consecutive decrease in annual spending. Spending on both capital construction and machinery and equipment are expected to fall.
- Total capital spending by private sector organizations is expected to decline 9.3%, from \$173.6 billion in 2015 to \$157.4 billion in 2016, while organizations in the public sector are anticipated to increase spending by 6.5%. The anticipated drop in private sector expenditures is largely attributable to declines in spending on capital construction.
- Capital expenditures of organizations in the mining, quarrying, and oil and gas extraction sector are forecast to drop by \$14.3 billion (or -23.1%) to \$47.7 billion in 2016, the second consecutive year of decline. The anticipated drop is largely attributable to the oil and gas extraction subsector, which would represent about 77% of the total spending for the sector. Both the conventional oil and gas extraction (-\$7.5 billion) and non-conventional oil extraction (-\$5.5 billion) industries anticipate declines in capital spending.
- Of the remaining 19 sectors, 11 foresee decreases in non-residential construction and machinery and equipment capital expenditures in 2016. The largest decline is anticipated in the manufacturing sector, where spending is expected to drop from \$19.1 billion in 2015 to \$17.0 billion in 2016. The decrease is forecast for both capital construction and machinery and equipment.

¹³ <http://www.statcan.gc.ca/daily-quotidien/160510/dq160510a-eng.pdf>
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A Conference Board of Canada study for the year 2013¹⁴ reports that in regards to ICT investments, most provinces are weak performers relative to international peers. The top-ranking provinces, P.E.I. and Ontario, score "B" grades, but trail half or more of the international peers. New Brunswick, Saskatchewan, and Newfoundland and Labrador score "D"s, while the remaining five provinces achieve only "C" grades. The said report further concludes that the reasons for such weak performance are the nature of Canada's industry structure, smaller firm size, relative low wages, lack of technology management capacity and generally unfavourable exchange rates.

Canadian businesses are not investing sufficiently in M&E nor in ITC. In the long term, this deficiency will impact labour and overall productivity and make Canada less competitive globally. The Canadian government should provide necessary monetary and fiscal incentives to rectify this deficiency.

3.5 Education and Training

The education and training of a country's human resources is a major factor in determining just how well the country's economy will do. In general, educated and well-trained workers tend to be more productive than workers with inferior education and training. The knowledge and skills of workers available is a key factor in determining both business and economic growth. Economies with a significant supply of skilled labour enabled through formal education and training, are often able to capitalize on this aptitude through development of more value-added industries, such as high-tech manufacturing and software development. An economy in which education and training are treated as an asset is often referred to as a knowledge-based economy.

3.5.1 Education

The following highlights from the OECD Report: *Education at a Glance 2016* (Canada)¹⁵ summarizes Canada's relative standing in this very important sector of economy.

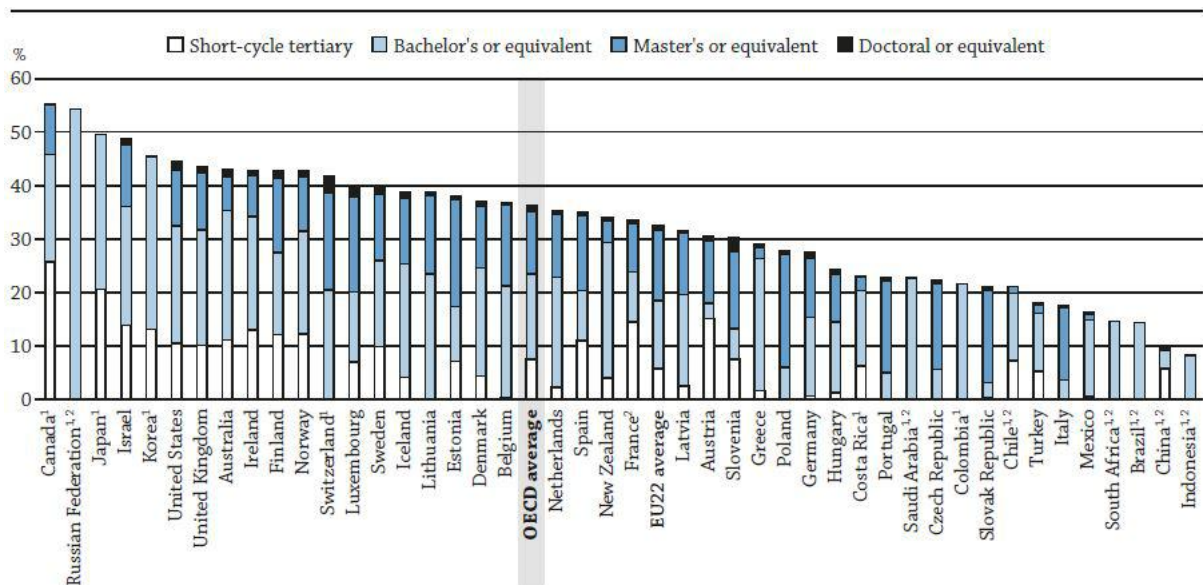
- Canada has the largest share of tertiary-educated adults of all the OECD countries but has a lower than average share of 25-64-year-olds with a master's, doctoral or equivalent degree although, Canada spends more per tertiary student than almost all the OECD countries (Figure 11).
- The gap between men and women's earnings is larger in Canada than on average across OECD countries. However, the gender gap in earnings narrows with increasing educational attainment. Canadians with foreign-born parents have high levels of educational attainment and upward educational mobility.

¹⁴ <http://www.conferenceboard.ca/hcp/provincial/innovation/ict.aspx>

¹⁵ http://gpseducation.oecd.org/Content/EAGCountryNotes/EAG2016_CN_CAN.pdf

- Canadian teachers are well paid: teachers' salaries are among the highest across OECD countries at more than USD 65,000 per year for teachers with 15 years of experience.
- Public expenditure on educational institutions at primary, secondary and post-secondary non-tertiary levels increased by 11% from 2008 to 2012, against an OECD average increase of only 5%.
- In 2012, 92% of expenditure on primary, secondary and post-secondary non-tertiary educational institutions was from public sources, similar to the OECD average of 91% for 2013. At tertiary level, the picture changes as only 52% of expenditure comes from public sources in Canada, much lower than the OECD average of 70%.
- Canada spends USD 21,500 per tertiary student each year. This is the highest amount across OECD countries after Luxembourg, Sweden, Switzerland, the United Kingdom and the United States.

Figure 11: Percentage of 25-64-year-olds with tertiary education, by level of tertiary education (2015)



1. Some levels of education are included in others. Refer to the source table for more details.

2. Reference year differs from 2015. Refer to the source table for more details.

Countries are ranked in descending order of the percentage of 25-64 year-olds with tertiary education, regardless of the level of tertiary attainment.

Source: OECD, Table A1.1. See Annex 3 for notes (www.oecd.org/education/education-at-a-glance-19991487.htm).

StatLink <http://dx.doi.org/10.1787/888933396600>

3.5.2 Quality of Education

Programme for International Student Assessment (PISA) assesses secondary education across OECD nations with respect to the skills of students in reading, mathematics and science. The PISA report for 2012 is reproduced as Appendix C. As per this report, Canada ranks 14th among 65 OECD regions. The overall score for Canada and specifically for reading and science is above corresponding OECD averages but in mathematics, it is below the OECD average. However, the change in scores relative to earlier measurements for all three categories is negative.

3.5.3 Training

Reducing skill gaps in organizations has long been regarded a major and ongoing challenge for people working in human resources and talent management. This is particularly true in this era of rapidly changing technology and business models. Most progressive organisations see training as a fundamental part of staff development, achieving business goals and increasing productivity. The Canadian economy is dominated by Small and Medium-sized Enterprises (SMEs). Due to lack of funds and other constraints, these businesses are not able to provide appropriate training for their workers, particularly older workers. The Statistics Canada Report on *Job Related Training of Older Workers*¹⁶ highlights the following characteristics of older workers:

- Older workers were significantly less likely to pursue job-related training than their core-age counterparts. Between July 2007 and June 2008, 32% of workers aged 55 to 64 years took some training compared to 45% of those aged 25 to 54 years. The age gap persisted even after labour market factors and personal characteristics were taken into consideration.
- Older workers with lower personal income, less than post-secondary education, temporary employment, and sales or service jobs, along with those working in the private sector and goods-producing industries were significantly less likely to participate in training than others of the same age.
- The training gap between older and younger workers has narrowed over time as the training rate for older workers more than doubled from 1991 to 2008. The ratio of core-age to older-worker training rates stood at 1.4 in 2008, compared to 2.5 in 1991.
- About 61% of the increase in the training participation rate of older workers was attributed to increases in educational attainment and changes in the types of jobs held by more recent cohorts.

¹⁶ <http://www.statcan.gc.ca/pub/75-001-x/2012002/article/11652-eng.pdf>
CPHR Canada

In summary, Canada does well in so far as enrollment up to secondary education institutions is concerned but lags at the tertiary level and in the quality of education as documented in PISA reports. The training opportunities for employees, particularly older workers are limited. It is imperative to design a policy response to correct this situation for enhancing the quality of Canada's human resources.

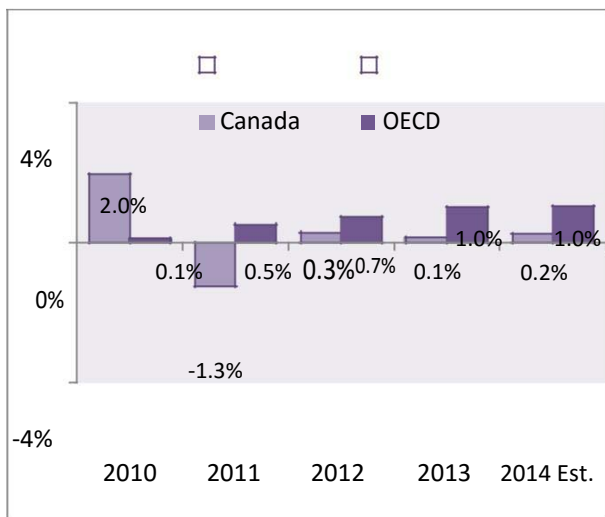
3.6 Health

The positive correlation between health and productivity is well documented. The following paragraphs present a high-level comparison of Canada with the other OECD countries as per the OECD report *Health at a Glance 2015*¹⁷.

- Life expectancy in Canada stands at one year longer than the OECD average and about three years higher than in the United States, but remains significantly lower than in leading OECD countries (Japan, Spain and Switzerland).
- Tobacco smoking in Canada is among the lowest among OECD countries, but the harmful use of alcohol is rising and the obesity rate among children and adults is higher than in most other OECD countries.
- The quality of cancer care in Canada (as measured by the survival of patients following diagnosis) is generally good but not the best, and the quality of primary care (as measured by avoidable hospital admissions) can also be improved.
- Growth: Following strong growth up to 2010, the growth rate in health spending per capita in Canada has slowed down markedly in recent years, being close to zero in real terms over the past four years (Figure 12).
- Share of GDP (Figure 13): The share of GDP allocated to health spending (excluding capital expenditure) in Canada was 10.2% in 2013, compared with an OECD average of 8.9%. However, it remains much lower than in the United States (16.4%).
- Per capita spending: Canada spent the equivalent of USD 4,351 per person on health in 2013, much more than the OECD average of USD 3,453, but only half of what the United States spent (USD 8,713). Public sources accounted for 71% of overall health spending, slightly less than the OECD average (73%).

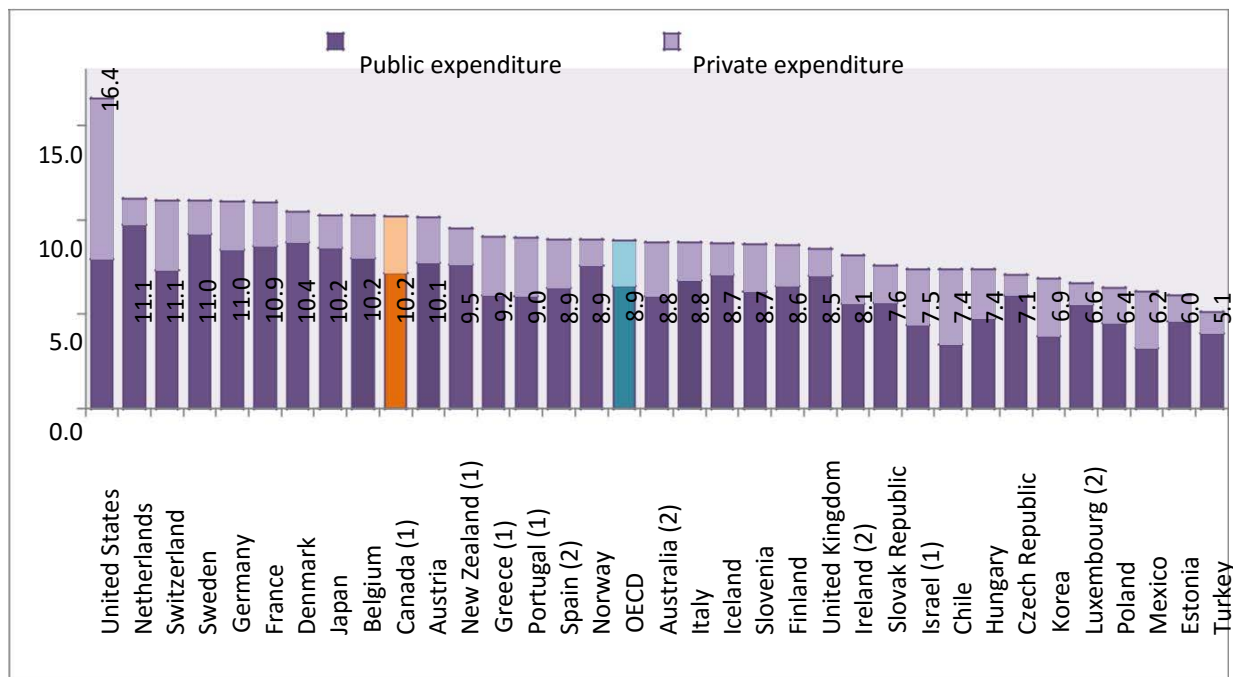
¹⁷ <http://www.oecd.org/health/health-at-a-glance.htm>
CPHR Canada

Figure 12: Annual health spending growth*, 2010-2014



* Per capita spending in real terms; Source: OECD Health Statistics 2015

Figure 13: Health spending* as a share of GDP, 2013



1 Preliminary estimate;

2 Data refer to 2012.

*Excluding Capital Expenditure

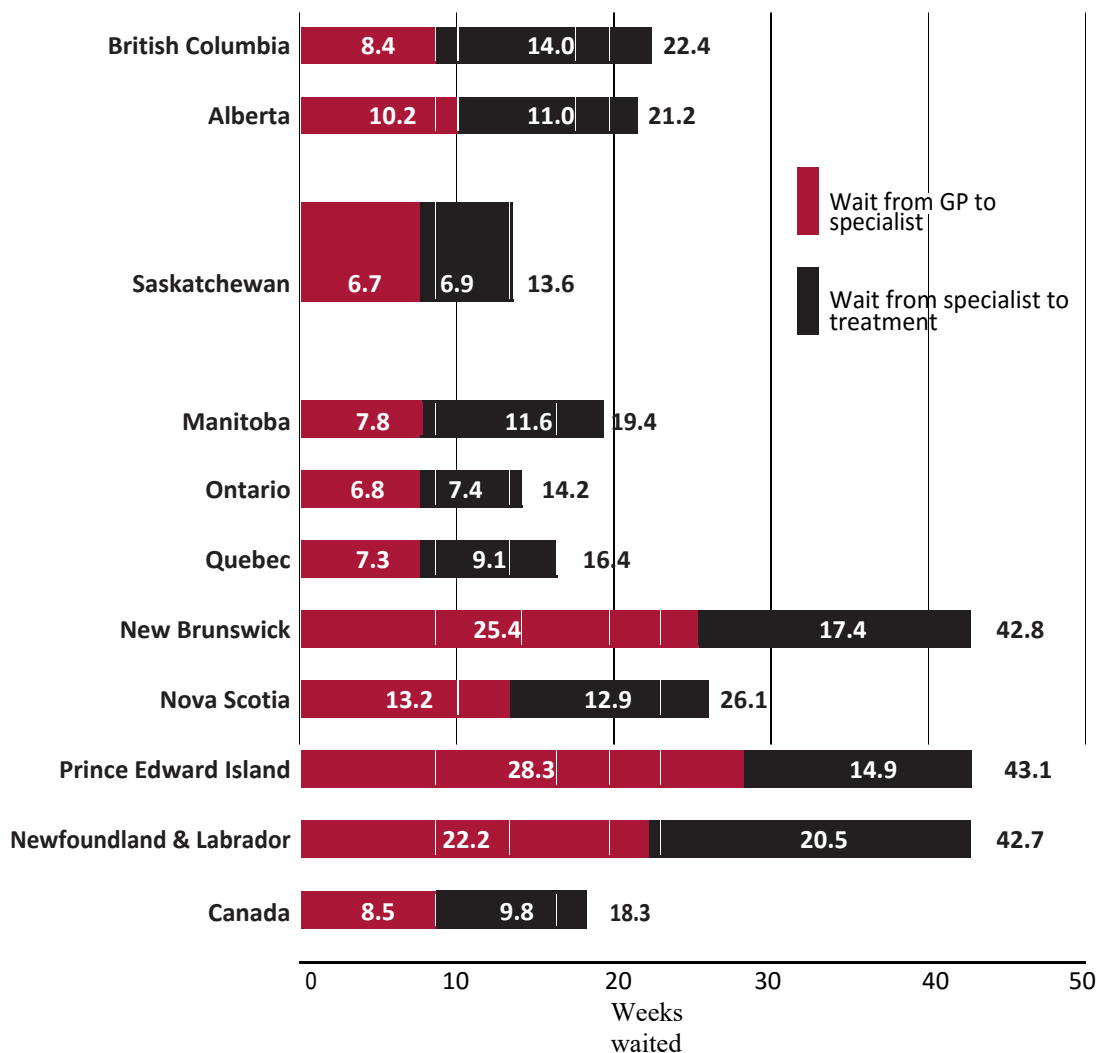
Source: OECD Health Statistics 2015

One of the glaring deficiencies of the Canadian health system is long wait time for visits to specialists as well as critical diagnostic and corrective procedures. A Fraser Institute Annual Report for 2015 "*Waiting Your Turn*" summarizes this deficiency as follows:

"Overall, waiting times for medically necessary treatment have not improved since last year. Specialist physicians surveyed report a median waiting time of 18.3 weeks between referral from a general practitioner and receipt of treatment—slightly longer than the 18.2 week wait reported in 2014. This year's wait time is 97% longer than in 1993 when it was just 9.3 weeks."

The following Figure (14) summarizes median wait time by province for 2015.

Figure 14: Median wait by province in 2015—weeks waited from referral by GP to treatment



Source: Fraser Institute Report *Waiting Your Turn* 2015

The universal Canadian health system is highly equitable but not the most efficient. The absence of growth in health spending as a percentage of GDP despite an aging population and long wait periods for visits to specialists are causes for concern. The wait period is also long for critical diagnostic and corrective procedures. It is critical to improve the system by innovating service delivery models and by more effectively allocating resources. Otherwise, there will be adverse impact on the productivity and health of Canada's human resources.

3.7 Job Satisfaction

Workers happy with their jobs are more open to new information, more productive, and more willing to go the extra mile. Moreover, engaged workers take the initiative to change their work environments in order to stay engaged. Following is the Abstract from a research paper, *'Happiness and Productivity'*¹⁸ by Andrew J Oswald, Eugenio Proto and Daniel Sgroi.

"Some firms say they care about the well-being and 'happiness' of their employees. But are such claims hype, or scientific good sense? We provide evidence, for a classic piece-rate setting, that happiness makes people more productive. In three different styles of experiment, randomly selected individuals are made happier. The treated individuals have approximately 12% greater productivity.

A fourth experiment studies major real-world shocks (bereavement and family illness). Lower Happiness is systematically associated with lower productivity. These different forms of evidence, with complementary strengths and weaknesses, are consistent with the existence of a causal link between human well-being and human performance."

The 2012 General Social Survey conducted by Statistics Canada¹⁹ concludes the following:

- Most parents are satisfied with their work-life balance.
- Overall, most parents who work full-time are satisfied with their work-life balance. In 2012, 3 out of 4 parents said they were satisfied or very satisfied with this balance (75%). The others were "neither satisfied nor dissatisfied" (15%), "dissatisfied" (8%) or "very dissatisfied" (1%).
- Of the parents who said that they were not satisfied, the most frequently mentioned reason for the dissatisfaction was not having enough time for family life (Figure 15). This was followed by spending too much time on their job or main activity, and not having enough time for other activities.
- Women were a little less likely than men to be satisfied. Specifically, 72% of mothers reported that they were satisfied or very satisfied with their work-life balance, compared with 78% of fathers.
- The absence of a spouse is associated with lower satisfaction with work-life balance.

¹⁸ <http://www2.warwick.ac.uk/fac/soc/economics/staff/eproto/workingpapers/happinessproductivity.pdf>

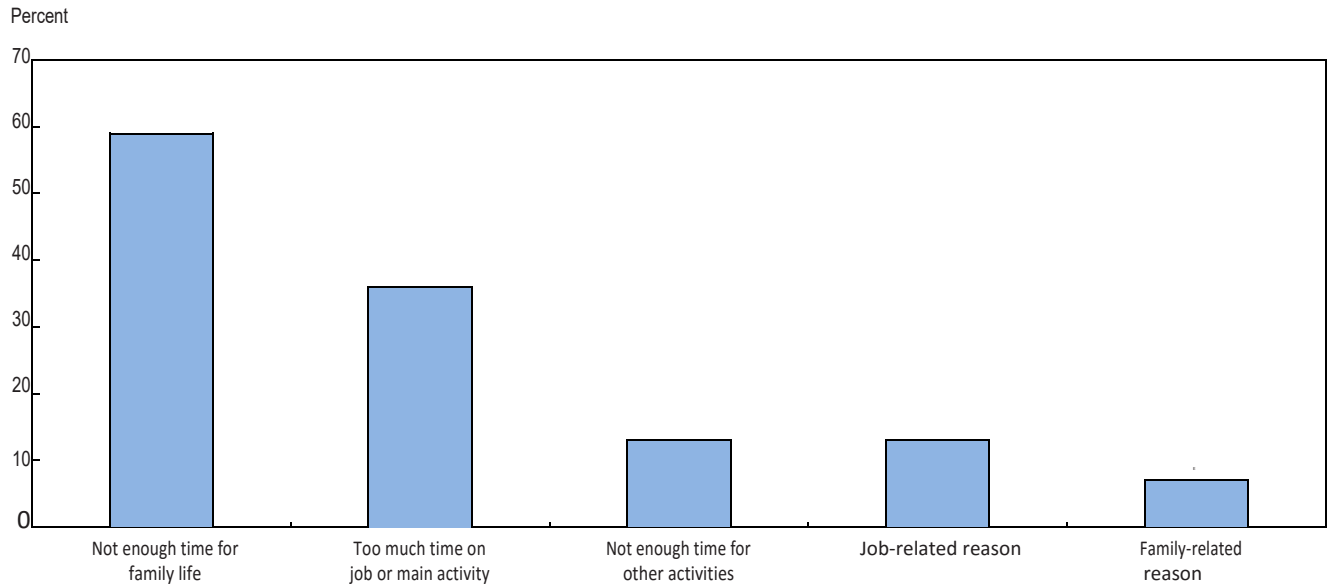
¹⁹ <http://www.statcan.gc.ca/pub/89-652-x/89-652-x2016003-eng.pdf>

- Parents “sandwiched” between taking care of children and sick family members were less satisfied.
- A higher level of education was not associated with greater satisfaction.
- Among parents who work more hours, fathers are more satisfied than mothers.
- According to the above-mentioned survey data, 69% of parents who worked shifts were satisfied with their work-life balance, compared with 77% of those with a regular daytime schedule.
- For employees, a flexible work schedule is associated with a higher level of satisfaction.
- The other measures associated with greater satisfaction with work-life balance include the possibility of taking leave without pay 1) to care for children; 2) to provide care to a spouse, partner or other family member; 3) for personal reasons.
- It should be noted that telework, sometimes presented as a measure to promote work-life balance, was not associated with different levels of satisfaction for men. Nonetheless, women who at least occasionally performed part of their paid work at home were more likely to report being satisfied with their work-life balance than others (78% and 70% respectively).
- At the regional level, parents in Prince Edward Island were the most satisfied with the balance between job and family life. The least satisfied were parents in Manitoba (Figure 16).

The chapter on “Life satisfaction”, in OECD publication²⁰ *Society at a Glance 2014: OECD Social Indicators* compares “Life Satisfaction” across OECD and non-OECD countries. Canada compares well with other countries but as in many other countries, the trend was negative during the financial crisis period (2007-2012). Figure 17 below depicts this comparison and trend.

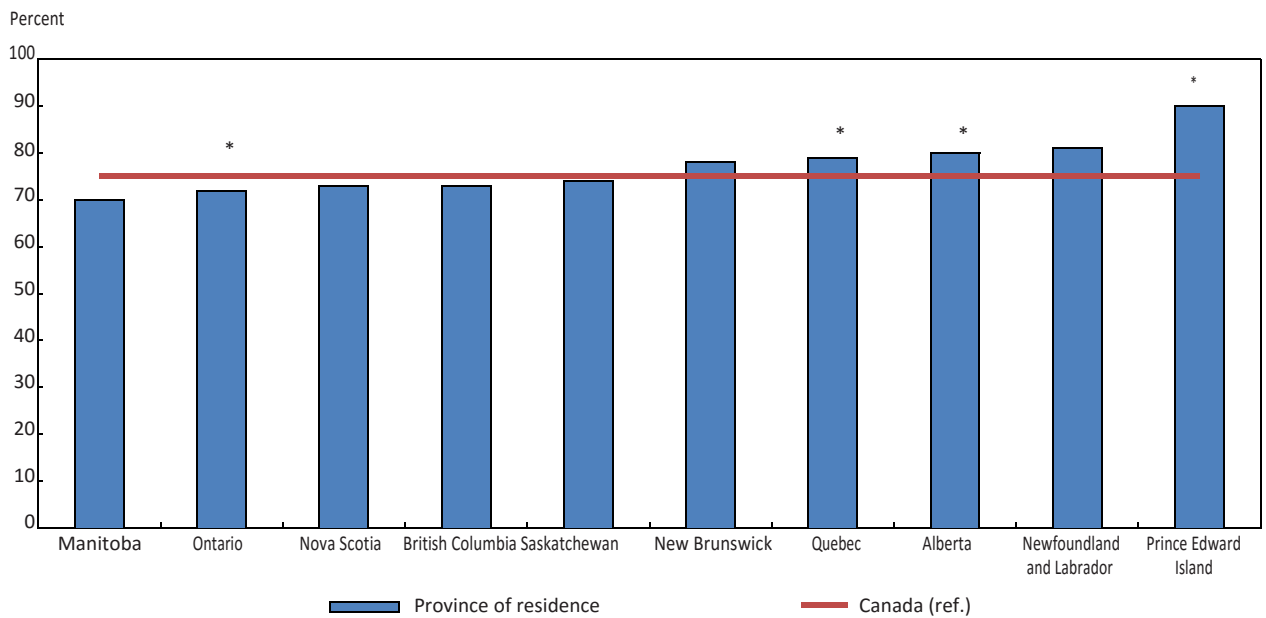
²⁰ <http://www.oecd-ilibrary.org/docserver/download/8113171e.pdf?expires=1479931939&id=id&accname=guest&checksum=74EBAD49238979E68B93C86709968E2D>

Figure 15: Main reasons for dissatisfaction with work-life balance, 2012



Source: Statistics Canada, General Social Survey, 2012

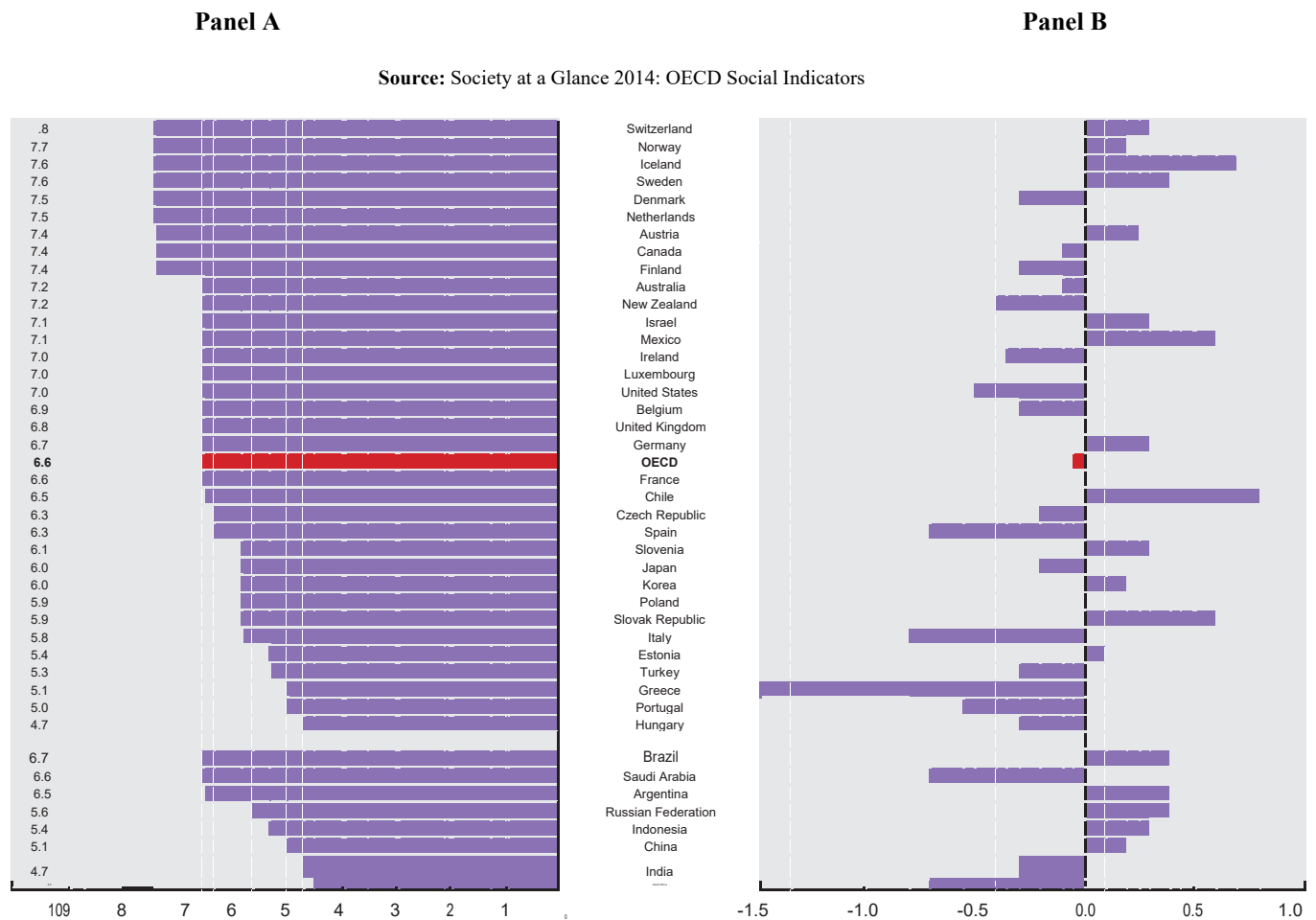
Figure 16: Percentage of parents who reported being satisfied or very satisfied with the work-life balance, by province of residence, 2012



* Significantly different from reference category ($p < 0.05$)

Source: Statistics Canada, General Social Survey, 2012.

Figure 17: Life satisfaction across selected OECD countries during the financial crisis



Panel A. Average points of life satisfaction on an 11-step ladder from 0-10, 2012
 Panel B. Changes in points of life satisfaction between 2007 and 2012

Canadians are generally happy with their jobs and private lives and their level of satisfaction compares well with the other OECD and non-OECD countries. Canadian employers can further enhance job satisfaction and productivity of their employees by providing them with flexible work schedules and other work-life balance measures.

4. Conclusions and Recommendations

4.1 Conclusions

The quality of a country's human resources is the main determinant of its global competitiveness and sustainable long term prosperity. Efficient and productive human resources propel the economy on the trajectory of growth and development. The major drivers of efficiency and productivity are identified as Institutions, Innovation, Infrastructure, Investment, Health, Education and Job Satisfaction.

The analysis of these drivers based on publicly available data indicates that Canada's record is mixed in absolute terms and in relational context when compared to the other OECD countries. There is ample opportunity for further enhancement of the quality of Canada's human resources.

The ongoing disruption of industries and the economy by emerging technologies should be factored in while updating market models to align with new realities. Available digital technologies should be leveraged for the well-being of workers and the development of their capabilities and jobs should be redesigned accordingly. Employers should note that from the employee's perspectives, the most valued job characteristics are a workplace free of harassment and discrimination, meaningful and challenging work, opportunity to make a difference and economic security.

For the past 30 years, the gap between Canadian productivity and that of other leading economies, including the United States, has grown. While the Federal Government has taken positive steps to address the issue, more is required to enhance Canada's competitiveness in the global economy and to protect Canada's standard of living in the years to come.

The cause of the productivity gap in Canada is difficult to identify and is almost certainly influenced by multiple factors. Research suggests less investment in capital compared to other countries, less focus on research and development, fewer large multinational firms based in Canada, and cultural differences (i.e. many perceive Canada as exhibiting a more risk adverse culture) all play a role²¹.

Further, Canada has a much larger proportion of small firms compared to peer countries, including the United States. Recent studies suggest that while innovative, smaller businesses have comparatively less labour productivity than larger firms which are able to capitalize on economies of scale²².

Canada's productivity gap can also be attributed to lower levels of spending on research and development and capital equipment. In Canada, firms spend comparatively less on research and development as the company grows. OECD research measuring entrepreneurship shows that firms in Canada with 50 or fewer employees spend 0.29% of GDP on research and

²¹ <http://www.theglobeandmail.com/report-on-business/waning-productivity-set-to-sap-growth-economist-says/article15146145/>

²² <http://www.statcan.gc.ca/daily-quotidien/140108/dq140108a-eng.pdf>

development, ranking eighth among 27 OECD countries. However, for firms with more than 250 employees, Canada's ranking falls to 16th²³.

There has also been considerable research done on Canada's immigration system and how attracting and improving the immigration process for highly skilled immigrants could help drive Canada's growth and productivity²⁴. A better immigration system will be critical to countering the effects of an aging domestic population in Canada.

Finally, encouraging more foreign direct investment (both outward and inward) can help to address the productivity gap. Recent research shows that foreign controlled firms spend more on research and development and are more capital intensive than Canadian controlled firms²⁵.

While the government should be commended for enacting measures to encourage productivity growth, more needs to be done to encourage Canadian businesses to innovate, to take calculated risks, and to enhance their competitiveness in the global economy. Higher productivity will result in increased wages, higher returns on investments, and more taxable income from business in Canada.

Not addressing the productivity gap will put increased pressure on government tax revenue and jeopardize the standard of living for all Canadians in the years to come.

4.2 Recommendations

The responsibility for enhancing Canada's human resources should be shared between the government and the employers making up Canada's employment market. The federal government, in exercising its mandate, should:

- 1) Enable more investment in machinery and equipment by expanding current grants/subsidies for the purchase of state of the art technology, and increasing tax incentives for applicable purchases of new capital equipment.
- 2) Continue to improve the efficiency and flexibility of Canada's immigration system. This flexibility should be geared towards Canada's predictable labour needs and intensified action should be taken on the recognition of foreign credentials.
- 3) Facilitate foreign direct investment in Canada by clearly defining which industries are protected in Canada and the parameters and conditions under which Canadian entities may be acquired by foreign firms and lifting some of the barriers that currently exist to increase competition (e.g. such as in the telecommunications sector).

²³ <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/insights-and-issues/ca-en-future-of-productivity-092812-aoda.pdf>

²⁴ <https://www.td.com/document/PDF/economics/special/td-economics-special-ab0610-productivity.pdf>

²⁵ Ibid.

- 4) Ensure that policies and incentives aimed at improving Canada's productivity are focused on company growth and profitability, rather than on size and ownership structure.
- 5) Hold the course on upgrading Canada's infrastructure to make it truly world class.
- 6) Rationalize regulatory burden and cost of compliance particularly for small and medium sized firms.

Canadian employers can, in the natural operational pursuit of perpetual growth and sustainability, complement government's actions by adopting best practices in the management of human resources and investing sufficiently in innovation, research, training and employee well-being.

Canada's human resources professionals can add considerable value in efforts to boost productivity growth because of their specialized first-hand knowledge of the issues and the insights they have acquired in the performance of their craft. The time is before Canada to collectively rally for improved outcomes that heighten Canada's productivity and competitiveness.

Appendix A

The Global Competitiveness Index (GCI) Framework: The 12 Pillars of Competitiveness



Appendix B

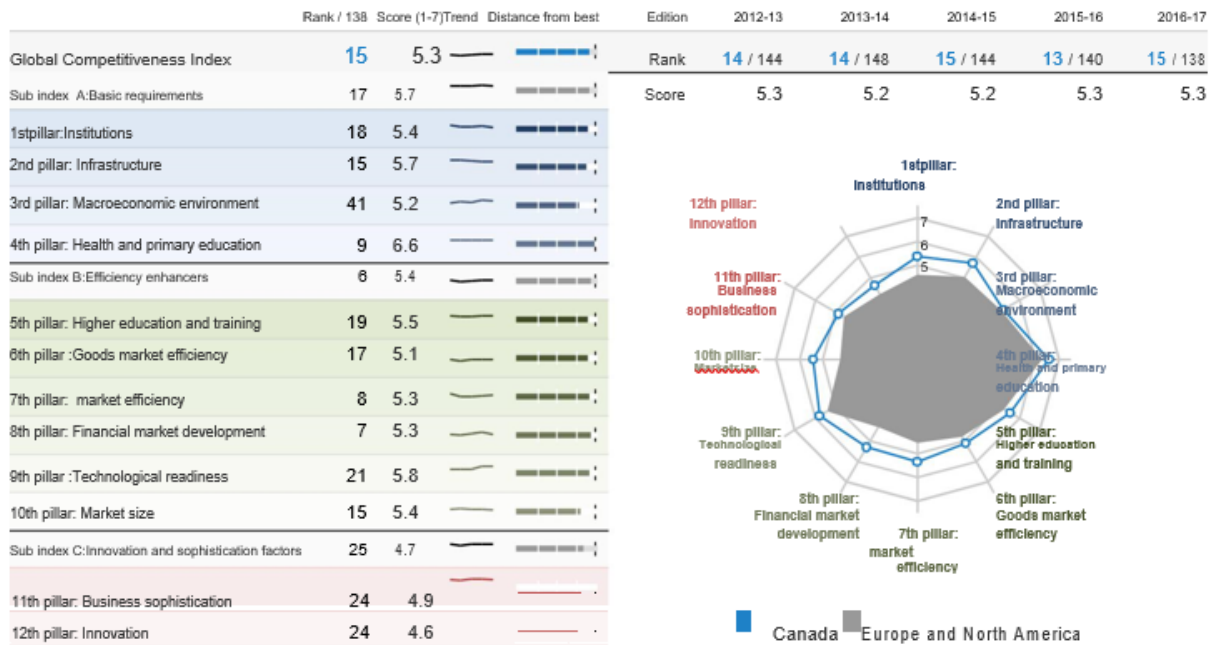


Global Competitiveness Index
2016-2017 edition

Key Indicators, 2015

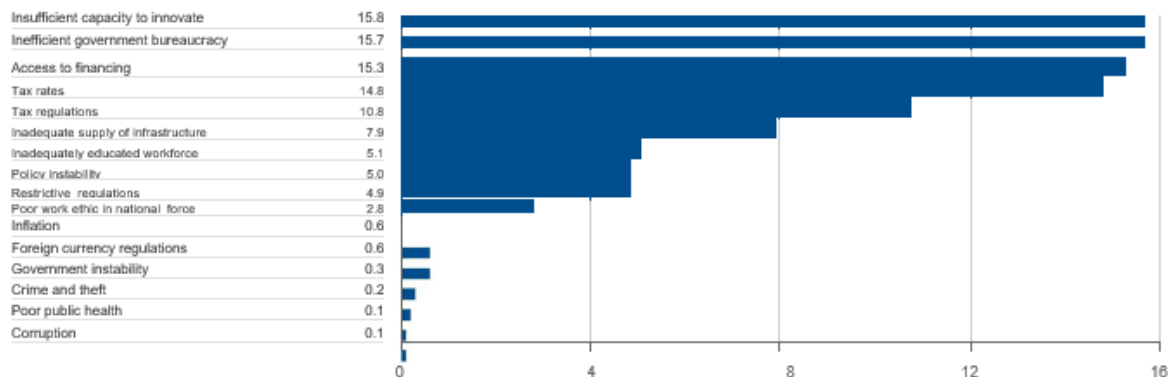
Population (millions)	35.8	GDP per capita (US\$)	43332.0
GDP (US\$ billions)	1552.4	GDP (PPP)% world GDP	1.44

Performance overview



Most problematic factors for doing business

Source: World Economic Forum, Executive Opinion Survey 2016



Source: International Monetary Fund; World Economic Outlook Database (April 2016)

Note 1: From the list of factors, respondents to the World Economic Forum's Executive Opinion Survey were asked to select the five most problematic factors for doing business in their country and to rank them between 1 (most problematic) and 5. The score corresponds to the responses weighted according to their rankings.

Note 2: Values are on a 1-to-7 scale unless indicated otherwise. Trend lines depict evolution in values since the 2012-2013 edition (or earliest edition available). For detailed definitions, sources, and periods, consult the interactive Country/Economy Profiles and Rankings at <http://gcr.weforum.org/>




Canada 150 and Beyond: The Role of Human Resources in Canada's Prosperity

The Global Competitiveness Index in detail

	Rank / 138	Value	Trend		Rank / 138	Value	Trend
1st pillar: Institutions	18	5.4		6th pillar Goods market efficiency	17	5.1	
1.01 Property rights	14	5.9		6.01 Intensity of local competition	32	5.4	
1.02 Intellectual property protection	15	5.9		6.02 Extent of market dominance	28	4.2	
1.03 Diversion of public funds	21	5.3		6.03 Effectiveness of anti-monopoly policy	21	4.7	
1.04 Public trust in politicians	20	4.7		6.04 Effect of taxation on incentives to invest	46	3.9	
1.05 Irregular payments and bribes	21	5.9		6.05 Total tax rate % profits	16	21.1	
1.06 Judicial independence	13	6.1		6.06 No. of procedures to start a business	3	2	
1.07 Favoritism in decisions of government officials	31	4.0		6.07 Time to start a business days	3	1.5	
1.08 Wastefulness of government spending	23	4.1		6.08 Agricultural policy costs	21	4.5	
1.09 Burden of government regulation	40	3.8		6.09 Prevalence of non-tariff barriers	63	4.5	
1.10 Efficiency of legal framework in settling disputes	20	5.0		6.10 Trade tariffs % duty	40	2.8	
1.11 Efficiency of legal framework in challenging regs	19	4.8		6.11 Prevalence of foreign ownership	15	5.5	
1.12 Transparency of government policy making	16	5.4		6.12 Business impact of rules on FDI	48	4.9	
1.13 Business costs of terrorism	67	5.3		6.13 Burden of customs procedures	28	5.0	
1.14 Business costs of crime and violence	36	5.3		6.14 Imports % GDP	94	34.3	
1.15 Organized crime	44	5.4		6.15 Degree of customer orientation	22	5.5	
1.16 Reliability of police services	10	6.3		6.16 Buyer sophistication	19	4.4	
1.17 Ethical behavior of firms	18	5.5		7th pillar: market efficiency	8	5.3	
1.18 Strength of auditing and reporting standards	8	6.2		7.01 Cooperation in employer relations	20	5.2	
1.19 Efficacy of corporate boards	16	5.9		7.02 Flexibility of wage determination	38	5.4	
1.20 Protection of minority shareholders' Interests	10	5.3		7.03 Hiring and firing practices	12	4.8	
1.21 Strength of investor protection 0-10 (best)	6	7.7		7.04 Redundancy costs weeks of salary	32	10.0	
2nd pillar: Infrastructure	15	5.7		7.05 Effect of taxation on incentives to work	32	4.4	
2.01 Quality of overall infrastructure	21	5.2		7.06 Pay and productivity	13	4.9	
2.02 Quality of roads	22	5.3		7.07 Reliance on professional management	14	5.8	
2.03 Quality of railroad infrastructure	18	4.8		7.08 Country capacity to retain talent	16	4.8	
2.04 Quality of port infrastructure	19	5.4		7.09 Country capacity to attract talent	10	5.1	
2.05 Quality of air transport infrastructure	16	5.8		7.10 Female participation in the force ratio to men	25	0.91	
2.06 Available airline seat kilometers millions/week	11	3831.3		8th pillar: Financial market development	7	5.3	
2.07 Quality of electricity supply	16	6.5		8.01 Financial services meeting business needs	26	5.0	
2.08 Mobile-cellular telephone subscriptions /100 pop.	119	81.9		8.02 Affordability of financial services	25	4.7	
2.09 Fixed-telephone lines /100 pop.	14	44.3		8.03 Financing through local equity market	14	5.1	
3rd pillar: Macro economic environment	41	5.2		8.04 Ease of access to loans	24	4.7	
3.01 Government budget balance % GDP	39	-1.7		8.05 Venture capital availability	33	3.4	
3.02 Gross national savings % GDP	67	20.5		8.06 Soundness of banks	3	6.5	
3.03 Inflation annual % change	1	1.1		8.07 Regulation of securities exchanges	7	6.0	
3.04 Government debt % GDP	120	91.5		8.08 Legal rights index 0-10 (best)	13	9	
3.05 Country credit rating 0-100 (best)	8			9th pillar Technological readiness	21	5.8	
4th pillar: Health and primary education	9	6.6		9.01 Availability of latest technologies	15	6.1	
4.01 Malaria incidence cases/100,000 pop.	n/a	S.L.		9.02 Firm-level technology absorption	31	5.3	
4.02 Business impact of malaria	NI-Appl	NI-Appl		9.03 FDI and technology transfer	20	5.1	
4.03 Tuberculosis incidence cases/100,000 pop.	8	5.2		9.04 Internet users % pop.	14	88.5	
4.04 Business impact of tuberculosis	20	6.6		9.05 Fixed-broadband Internet subscriptions /100 pop.	13	36.4	
4.05 HIV prevalence % adult pop.	60	0.3		9.06 Internet bandwidth kb/s/user	24	135.5	
4.06 Business impact of HIV/AIDS	27	6.3		9.07 Mobile-broadband subscriptions /100 pop.	60	56.3	
4.07 Infant mortality deaths/1,000 live births	32	4.3		10th pillar: Market size	15	5.4	
4.08 Life expectancy years	13	82.0		10.01 Domestic market size index	15	5.3	
4.09 Quality of primary education	13	5.5		10.02 Foreign market size index	24	5.8	
4.10 Primary education enrollment rate net %	9	99.5		10.03 GDP (PPP) PPP \$ billions	15	1631.9	
5th pillar: Higher education and training	19	5.5		10.04 Exports % GDP	79	31.2	
5.01 Secondary education enrollment rate gross %	18	109.9		11th pillar Business sophistication	24	4.9	
5.02 Tertiary education enrollment rate gross %	45	58.9		11.01 Local supplier quantity	29	4.8	
5.03 Quality of the education system	15	5.2		11.02 Local supplier quality	13	5.4	
5.04 Quality of math and science education	13	5.3		11.03 State of cluster development	20	4.7	
5.05 Quality of management schools	8	5.7		11.04 Nature of competitive advantage	39	4.1	
5.06 Internet access in schools	15	5.8		11.05 Value chain breadth	46	4.2	
5.07 Local availability of specialized training services	9	5.8		11.06 Control of international distribution	25	4.5	
5.08 Extent of staff training	29	4.6		11.07 Production process sophistication	18	5.5	
				11.08 Extent of marketing	25	5.0	
				11.09 Willingness to delegate authority	11	5.1	
				12th pillar: Innovation	24	4.6	
				12.01 Capacity for innovation	26	5.0	
				12.02 Quality of scientific research institutions	17	5.6	
				12.03 Company spending on R&D	29	4.2	
				12.04 University-industry collaboration in R&D	23	4.6	
				12.05 Gov't procurement of advanced tech products	67	3.3	
				12.06 Availability of scientists and engineers	6	5.4	
				12.07 PCT patent applications applications/million pop.	19	90.1	

Appendix C

Programme for International Student Assessment (PISA) - Snapshot of performance in math, reading and science

-  Countries/economies with a mean performance/share of top performers above the OECD average
 Countries/economies with a share of low achievers below the OECD average
-  Countries/economies with a mean performance/share of low achievers/share of top performers not statistically significantly different from the OECD average
-  Countries/economies with a mean performance/share of top performers below the OECD average
 Countries/economies with a share of low achievers above the OECD average

	Mathematics				Reading		Science	
	Mean score in PISA 2012	Share of low achievers in mathematics (Below Level 2)	Share of top performers in mathematics (Level 5 or 6)	Annualised change in score points	Mean score in PISA 2012	Annualised change in score points	Mean score in PISA 2012	Annualised change in score points
OECD average	494	23.1	12.6	-0.3	496	0.3	501	0.5
Shanghai-China	613	3.8	55.4	4.2	570	4.6	580	1.8
Singapore	573	8.3	40.0	3.8	542	5.4	551	3.3
Hong Kong-China	561	8.5	33.7	1.3	545	2.3	555	2.1
Chinese Taipei	560	12.8	37.2	1.7	523	4.5	523	-1.5
Korea	554	9.1	30.9	1.1	536	0.9	538	2.6
Macao-China	538	10.8	24.3	1.0	509	0.8	521	1.6
Japan	536	11.1	23.7	0.4	538	1.5	547	2.6
Liechtenstein	535	14.1	24.8	0.3	516	1.3	525	0.4
Switzerland	531	12.4	21.4	0.6	509	1.0	515	0.6
Netherlands	523	14.8	19.3	-1.6	511	-0.1	522	-0.5
Estonia	521	10.5	14.6	0.9	516	2.4	541	1.5
Finland	519	12.3	15.3	-2.8	524	-1.7	545	-3.0
Canada	518	13.8	16.4	-1.4	523	-0.9	525	-1.5
Poland	518	14.4	16.7	2.6	518	2.8	526	4.6
Belgium	515	18.9	19.4	-1.6	509	0.1	505	-0.8
Germany	514	17.7	17.5	1.4	508	1.8	524	1.4
Viet Nam	511	14.2	13.3	m	508	m	528	m
Austria	506	18.7	14.3	0.0	490	-0.2	506	-0.8
Australia	504	19.7	14.8	-2.2	512	-1.4	521	-0.9
Ireland	501	16.9	10.7	-0.6	523	-0.9	522	2.3
Slovenia	501	20.1	13.7	-0.6	481	-2.2	514	-0.8
Denmark	500	16.8	10.0	-1.8	496	0.1	498	0.4
New Zealand	500	22.6	15.0	-2.5	512	-1.1	516	-2.5
Czech Republic	499	21.0	12.9	-2.5	493	-0.5	508	-1.0
France	495	22.4	12.9	-1.5	505	0.0	499	0.6
United Kingdom	494	21.8	11.8	-0.3	499	0.7	514	-0.1
Iceland	493	21.5	11.2	-2.2	483	-1.3	478	-2.0
Latvia	491	19.9	8.0	0.5	489	1.9	502	2.0
Luxembourg	490	24.3	11.2	-0.3	488	0.7	491	0.9
Norway	489	22.3	9.4	-0.3	504	0.1	495	1.3
Portugal	487	24.9	10.6	2.8	488	1.6	489	2.5
Italy	485	24.7	9.9	2.7	490	0.5	494	3.0
Spain	484	23.6	8.0	0.1	488	-0.3	496	1.3
Russian Federation	482	24.0	7.8	1.1	475	1.1	486	1.0
Slovak Republic	482	27.5	11.0	-1.4	463	-0.1	471	-2.7
United States	481	25.8	8.8	0.3	498	-0.3	497	1.4
Lithuania	479	26.0	8.1	-1.4	477	1.1	496	1.3
Sweden	478	27.1	8.0	-3.3	483	-2.8	485	-3.1
Hungary	477	26.1	9.3	-1.3	488	1.0	494	-1.6
Croatia	471	29.9	7.0	0.6	485	1.2	491	-0.3
Israel	466	33.5	9.4	4.2	486	3.7	470	2.8
Greece	453	35.7	3.9	1.1	477	0.5	467	-1.1
Serbia	449	38.9	4.6	2.2	446	7.6	445	1.5
Turkey	448	42.0	5.9	3.2	475	4.1	463	6.4
Romania	445	40.8	3.2	4.9	438	1.1	439	3.4
Cyprus ^{1,2}	440	42.0	3.7	m	449	m	438	m
Bulgaria	439	43.8	4.1	4.2	436	0.4	446	2.0
United Arab Emirates	434	46.3	3.5	m	442	m	448	m
Kazakhstan	432	45.2	0.9	9.0	393	0.8	425	8.1
Thailand	427	49.7	2.6	1.0	441	1.1	444	3.9
Chile	423	51.5	1.6	1.9	441	3.1	445	1.1
Malaysia	421	51.8	1.3	8.1	398	-7.8	420	-1.4
Mexico	413	54.7	0.6	3.1	424	1.1	415	0.9
Montenegro	410	56.6	1.0	1.7	422	5.0	410	-0.3
Uruguay	409	55.8	1.4	-1.4	411	-1.8	416	-2.1
Costa Rica	407	59.9	0.6	-1.2	441	-1.0	429	-0.6
Albania	394	60.7	0.8	5.6	394	4.1	397	2.2
Brazil	391	67.1	0.8	4.1	410	1.2	405	2.3
Argentina	388	66.5	0.3	1.2	396	-1.6	406	2.4
Tunisia	388	67.7	0.8	3.1	404	3.8	398	2.2
Jordan	386	68.6	0.6	0.2	399	-0.3	409	-2.1
Colombia	376	73.8	0.3	1.1	403	3.0	399	1.8
Qatar	376	69.6	2.0	9.2	388	12.0	384	5.4
Indonesia	375	75.7	0.3	0.7	396	2.3	382	-1.9
Peru	368	74.6	0.6	1.0	384	5.2	373	1.3

1. Source: OECD, PISA 2012 Database; Tables I.2.1a, I.2.1b, I.2.3a, I.2.3b, I.4.3a, I.4.3b, I.5.3a and I.5.3b.

Selected References

Andrew J. Oswald, Eugenio Proto, and Daniel Sgroi, *Happiness and Productivity JOLE 3rd Version: 10 February 2014* Accessed online (October 7, 2016): (<http://www2.warwick.ac.uk/fac/soc/economics/staff/eproto/workingpapers/happinessproductivity.pdf>)

Bank of Canada, *The Virtue of Productivity in a Wicked World*(Remarks by Mark Carney Governor of the Bank of Canada, 24 March 2010, Ottawa, Ontario) Accessed online(September 14,2016): (<http://www.bankofcanada.ca/wp-content/uploads/2010/05/sp240310.pdf>)

Canadian Infrastructure Report Card, *Informing The Future 2016* Accessed online (September20, 2016): (<http://canadianinfrastructure.ca/en/index.html>)

Deloitte, *The Future of Productivity in Canada, 2012*. Accessed online (September21, 2016): (<https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/insights-and-issues/ca-en-future-of-productivity-092812-aoda.pdf>)

Fraser Institute, *Waiting Your Turn Wait Times for Health Care in Canada, 2015 Report* Accessed online (September 23,2016): (<https://www.fraserinstitute.org/sites/default/files/waiting-your-turn-2015-exec-summary.pdf>)

Government of Canada, *SME Regulatory Compliance Cost Report Results from the 2011 Statistics Canada Survey of Regulatory Compliance Costs September 2013* Accessed online(October 17,2016): ([http://www.reducingpaperburden.gc.ca/eic/site/pbri-iafp.nsf/vwapj/09-2013_eng.pdf/\\$file/09-2013_eng.pdf](http://www.reducingpaperburden.gc.ca/eic/site/pbri-iafp.nsf/vwapj/09-2013_eng.pdf/$file/09-2013_eng.pdf))

Statistics Canada, *Capital and Repair Expenditures Survey, 2014 (revised), 2015 (preliminary) and 2016 (intentions) The Daily, Tuesday, May 10, 2016* Accessed online (October 19, 2016): (<http://www.statcan.gc.ca/daily-quotidien/160510/dq160510a-eng.pdf>)

Statistics Canada, *Job-related training of older workers by Jungwee Park April 20, 2012* Accessed online (October 24, 2016): (<http://www.statcan.gc.ca/pub/75-001-x/2012002/article/11652-eng.pdf>)

Statistics Canada, *Portrait of Canada's Labour Force National Household Survey, 2011* Accessed online (September 10, 2016): (<http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/99-012-x2011002-eng.pdf>)

Statistics Canada, *Public confidence in Canadian institutions December 7, 2015* Accessed online (September 12, 2016): (<http://www.statcan.gc.ca/pub/89-652-x/89-652-x2015007-eng.pdf>)

Statistics Canada, *Recent Developments in the Canadian Economy: Fall 2016* Accessed online (September 17, 2016): (<http://www.statcan.gc.ca/pub/11-626-x/11-626-x2016061-eng.pdf>)

Statistics Canada, *Satisfaction with work-life balance: Fact sheet April 14, 2016* Accessed online (October 16, 2016):
(<http://www.statcan.gc.ca/pub/89-652-x/89-652-x2016003-eng.pdf>)

Statistics Canada, *Spending on research and development, 2015 (intentions) The Daily, Wednesday, September 23, 2015* Accessed online (September 25, 2016):
(<http://www.statcan.gc.ca/daily-quotidien/150923/dq150923b-eng.pdf>)

Statistics Canada, *Study: The impact of Canada's firm-size disadvantage on the productivity gap between Canada and the United States, January 8, 2014*. Accessed online (October 26, 2016):
(<http://www.statcan.gc.ca/daily-quotidien/140108/dq140108a-eng.pdf>)

Statistics Canada, *2016 Census Program release schedule* Accessed online (September 29, 2016):
(<http://www12.statcan.gc.ca/census-recensement/2016/ref/release-dates-diffusion-eng.cfm>)

TD Bank Financial Group, *The Productivity Puzzle: Why is the Canadian record so poor and what can be done about it, June 3, 2010*. Accessed online (September 30, 2016):
(<https://www.td.com/document/PDF/economics/special/td-economics-special-ab0610-productivity.pdf>)

The Conference Board of Canada, *How Canada Performs > Provincial and Territorial Ranking > Innovation > ICT Investment September 2015*. Accessed online (September 30, 2016):
(<http://www.conferenceboard.ca/hcp/provincial/innovation/ict.aspx>)

The Globe and Mail, *Waning Productivity Set to Sap Canadian Growth, Globe & Mail, and October 29, 2013* Accessed online (September 3, 2016):
(<http://www.theglobeandmail.com/report-on-business/waning-productivity-set-to-sap-growth-economist-says/article15146145/>)

The Organisation for Economic Co-operation and Development (OECD) *Education At a Glance (Canada), 2016* Accessed online (October 27, 2016):
(http://gpseducation.oecd.org/Content/EAGCountryNotes/EAG2016_CN_CAN.pdf)

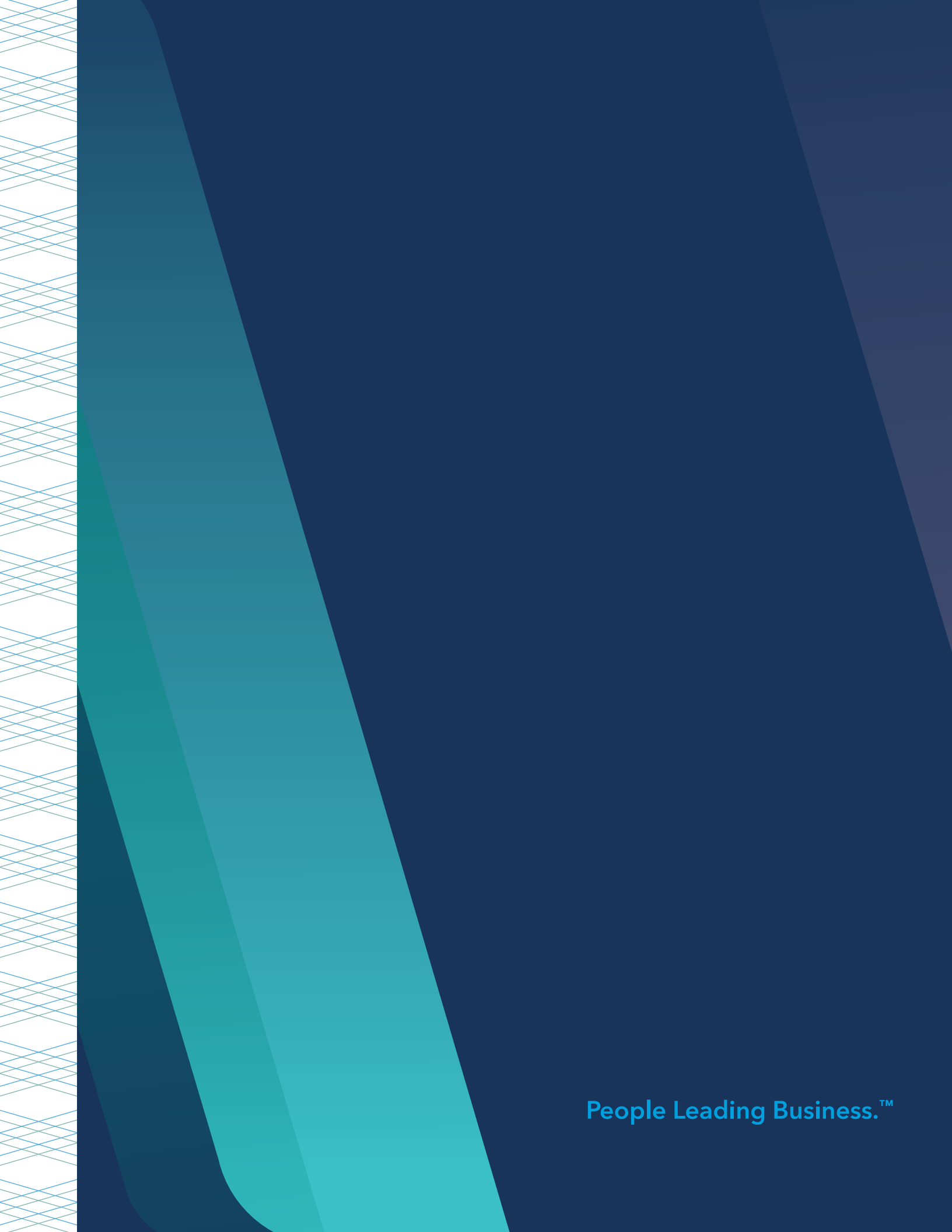
The Organisation for Economic Co-operation and Development (OECD) *Society at a Glance 2014 OECD Social Indicators* Accessed online (October 28, 2016):
(<http://www.oecdilibrary.org/docserver/download/8113171e.pdf?expires=1479931939&id=id&accname=guest&checksum=74EBAD49238979E68B93C86709968E2D>)

The Organisation for Economic Co-operation and Development (OECD), *Health at a Glance 2015: OECD Indicators* Accessed online (October 21, 2016):
(<http://www.oecd.org/health/health-at-a-glance.htm>)

The Organisation for Economic Co-operation and Development (OECD), *Compendium of Productivity Indicators 2015* Accessed online (October 23, 2016):
(<http://ifuturo.org/documentacion/productivity%20indicators.pdf>)

The World Economic Forum, *The Global Competitiveness Report 2016-2017* Accessed online (September 2, 2016):

(http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf)



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