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Employment Trends, Seasonality and Cycles in Canada

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André Léonard

Economics, Resources and International Affairs Division
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Employment Trends, Seasonality and Cycles in Canada
(Background Paper)

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EMPLOYMENT TRENDS, SEASONALITY AND CYCLES IN CANADA

1 INTRODUCTION

In 1976, there was a total of 9.7 million full- and part-time jobs in Canada. Nearly 40 years later, in 2014, there were 17.9 million jobs – almost double that number. This increase is largely attributable to population growth and a higher participation rate – that is, a greater proportion of the population that is either employed or looking for work – especially among women (since 1976) and among those 55 and over (since 1995). Meanwhile, the unemployment rate remained fairly stable (7.1% in 1976, compared with 6.9% in 2014).[1]

However, employment has not increased at the same rate in all industries because of the way the industries have been affected by changes in technology, demographics and consumer preferences, by international competition and by the value of the Canadian dollar.

This paper looks at employment by industry. It analyzes job growth in Canada by separating the industries that experienced slower growth, or even a decline, from those that experienced faster growth. The paper also examines the seasonal and cyclical nature of employment by industry.

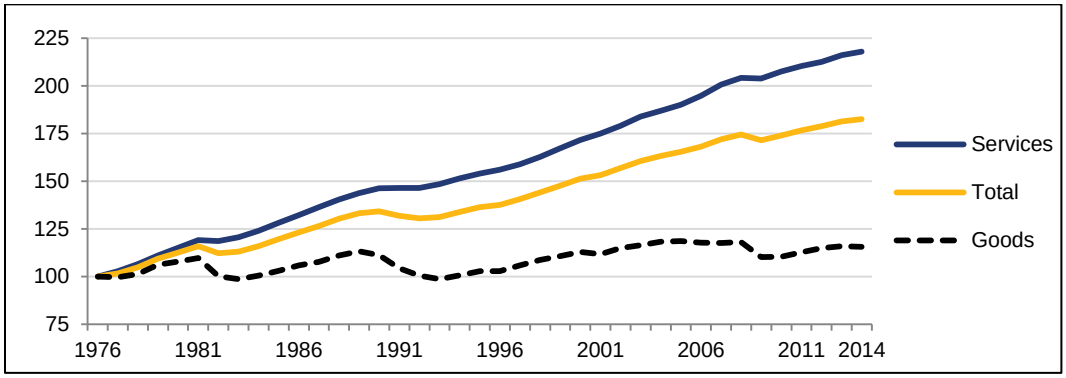
It is important to note that a decrease in the number of jobs in an industry does not necessarily mean that the industry is in decline. Indeed, productivity growth and the use of new technologies can lead to a decrease in the number of jobs while maintaining production at a similar or higher level.

2 LONG-TERM TRENDS

As Figure 1 illustrates, total employment in Canada increased by 83% between 1976 and 2014. However, employment in the goods sector increased by only 16%, while employment in the services sector increased by 118%. The proportion of total employment in the services sector increased from 65% in 1976 to 78% in 2014. This represents an average annual change of 0.4% in the goods sector and 2.1% in the services sector.

These changes can be broken down further by examining the various components of these two broad categories of industries; however, data at a more disaggregated level have been available only since 1987. From 1987 to 2014, the average annual change in employment was 1.4% for the whole economy, 0.3% for the goods sector and 1.8% for the services sector.

Figure 1 – Index of Number of Jobs by Sector (Goods or Services), 1976–2014, Canada (1976 = 100)



Source: Figure prepared by the author using data obtained from Statistics Canada, "Table 282-0008: Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual (persons)," CANSIM (database), accessed 2 February 2015.

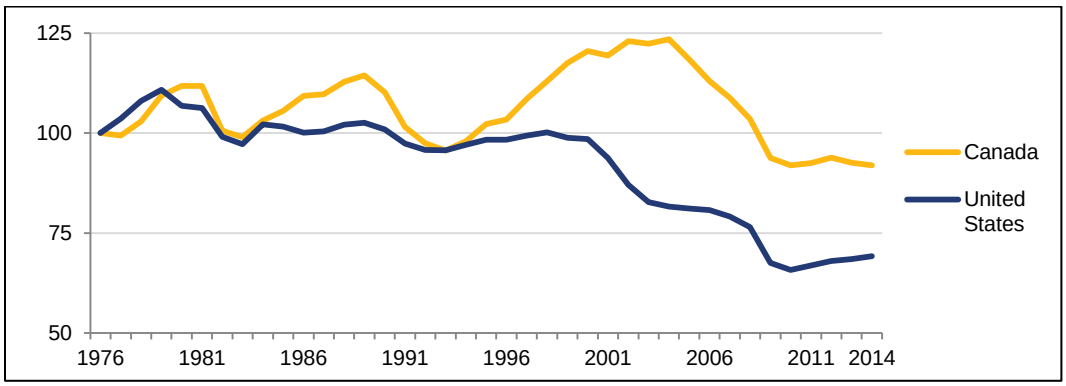
2.1 Goods Sector

The poorer job performance in the goods sector is primarily attributable to the 8% decline in employment in the manufacturing industry[2] and the 34% decline in employment in agriculture. Agriculture accounts for less than 10% of jobs in the goods sector, while manufacturing accounts for about 50% of jobs.

2.1.1 Manufacturing

As Figure 2 shows, employment in the manufacturing industry followed the recessions and recoveries of the 1980s and 1990s in Canada and then experienced a 26% decline between 2004 and 2010, after which it stagnated.

Figure 2 – Index of Number of Jobs, Manufacturing Industry, 1976–2014, Canada and United States (1976 = 100)



Source: Figure prepared by the author using data obtained from Statistics Canada, "Table 282-0008: Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual (persons)," CANSIM (database); and United States Department of Labor, Bureau of Labor Statistics, *Data Retrieval: Employment, Hours, and Earnings (Current Employment Survey)*, Series CEU3000000001, accessed 2 February 2015.

In the United States, following a period of relative stability between 1976 and 1998, employment in the manufacturing industry experienced a sharp decline, dropping by 34% between 1998 and 2010, after which it increased slightly.

Moreover, employment in the manufacturing industry accounted for no more than 9.6% of total jobs in Canada in 2014, compared with 19.1% in 1976.

Table 1 shows the average annual change in employment in certain manufacturing subsectors, and during certain periods.

Table 1 – Average Annual Growth Rate in Employment in Manufacturing, by Period and Selected Subsector (%), 1987–2014, Canada

Subsector	1987–1993	1993–2004	2004–2010	2010–2014	1987–2014
Machinery manufacturing	-5.1	6.3	-4.7	5.9	1.1
Food manufacturing	-1.1	2.3	-2.2	1.6	0.4
Transportation equipment manufacturing	-0.5	3.0	-6.5	3.4	0.1
Primary metal manufacturing	-2.6	-1.1	-5.7	1.7	-2.1
Paper manufacturing	-0.3	-1.4	-5.7	-1.4	-2.1
Electrical equipment, appliances and components manufacturing	-8.6	0.9	-0.9	-5.7	-2.7
Clothing manufacturing	-2.6	-1.8	-11.5	-8.6	-5.2
Manufacturing	**-2.3**	**2.4**	**-4.8**	**0.0**	**-0.7**

Source: Table prepared by the author using data obtained from Statistics Canada, "Table 282-0008: Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual (persons)," CANSIM (database), accessed 2 February 2015; and LFS data obtained directly from Statistics Canada.

From 1987 to 2014, employment increased in a very few subsectors of the Canadian manufacturing industry. For example, in the machinery manufacturing subsector (agricultural, industrial or other), employment experienced an average annual growth of 1.1% between 1987 and 2014. This subsector accounted for 8% of manufacturing jobs in 2014 and did especially well between 1993 and 2004, and after 2010. The only two other major manufacturing subsectors that recorded positive average annual growth between 1987 and 2014 were food manufacturing (0.4%) and transportation equipment manufacturing (0.1%).

By contrast, employment in the clothing manufacturing subsector declined at an average annual rate of 5.2% between 1987 and 2014. While 115,900 individuals were employed in that subsector in 1987, the figure had dropped to 27,200 by 2014. The lion's share of this decline occurred between 2004 and 2014 (from 81,300 jobs to 27,200 jobs).

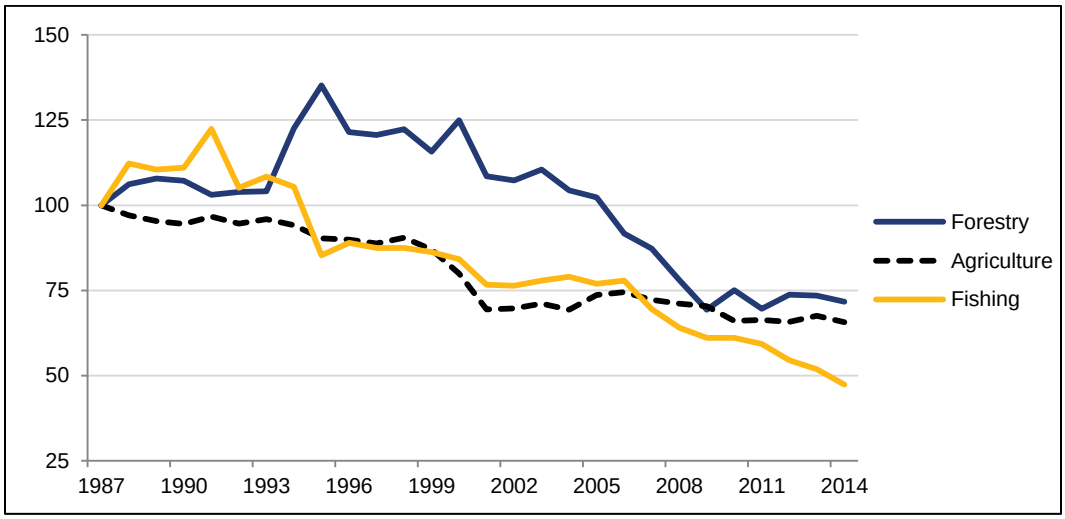
Between 1987 and 2014, there was a fairly significant drop in average annual employment in other manufacturing subsectors, including primary metal manufacturing (-2.1%), paper manufacturing (-2.1%) and electrical equipment, appliances and components manufacturing (-2.7%).

Other smaller subsectors (not shown in Table 1) experienced an even sharper decline, namely, textile products mills (-3.5%), textile mills (-3.9%)[3] and leather products manufacturing (-7.3%).

2.1.2 Agriculture, Fishing and Forestry

As Figure 3 illustrates, the forestry,[4] agriculture and fishing industries experienced similar trends between 1987 and 2014. However, unlike employment in the two other industries, employment in the forestry industry rose sharply in 1994 and 1995.

Figure 3 – Index of Number of Jobs, Selected Industries, 1987–2014, Canada (1987 = 100)



Source: Figure prepared by the author using Labour Force Survey data obtained directly from Statistics Canada.

Between 1987 and 2014, employment in the fishing industry fell by an average of 2.7% per year, the decline being most pronounced starting in 1991. During the same period, employment in agriculture[5] experienced an average annual decline of 1.5%. During the short but difficult period between 1998 and 2001, employment in the agriculture industry fell by 23% in three years, but this has been followed by a more stable period. Between 1987 and 2014, the average annual decline was especially pronounced in the cattle subsector (-2.1%) and the grain and oilseed subsector (-2.3%), although the latter has turned around since 2007, posting an average annual growth rate of 3.9%.

The forestry industry experienced two different periods in terms of employment: during the first, from 1987 to 1995, employment grew by an average of 3.8% per year, and during the second, from 1995 to 2014, there was an average annual decline of 3.3%. The overall result was an average annual reduction in employment of 1.2% between 1987 and 2014.

2.1.3 Mining, Oil and Gas

Some goods-producing industries, including mining, quarrying, and oil and gas extraction, experienced strong employment growth during the period that was reviewed, posting average annual employment growth of 1.9% from 1987 to 2014, compared with 1.4% in the total economy and 0.3% in the goods sector.

This strong performance is entirely attributable to two subsectors, namely oil and gas extraction (average annual growth of 3%) and support activities for mining and oil and gas extraction (average annual growth of 4.9%).[6] During that period, employment in the non-metallic mineral mining subsector (e.g., stone, marble and potash) increased by 1.6% per year, that is, slightly less than the industry average.

Some industry subsectors, however, underperformed. For example, between 1987 and 2014, employment declined by 1.7% per year on average in the metal ore mining subsector (iron, nickel, silver, copper, etc.) and by 2% per year on average in the coal subsector.

2.1.4 Utilities

Between 1987 and 2014, employment in the utilities industry increased at an average annual growth rate of 0.7%, which was higher than the overall average annual growth rate for all goods-producing industries (0.3%).

This industry is mainly composed of the electric power generation, transmission and distribution subsector, which accounted for more than three quarters of the industry's jobs in 2014. Between 1987 and 2014, employment in this subsector increased at an average annual rate of 0.5%. During this period, the natural gas distribution subsector posted an average annual decline in employment of 0.5%, and the water and sewer networks subsector posted an average annual increase in employment of 3.3%.

2.1.5 Construction

Employment in the construction industry also experienced strong average annual growth (2.4%) between 1987 and 2014. This growth, which was higher than that in the total economy and in the goods-producing industries, is primarily attributable to the average annual growth in utility system construction (3.3%), residential building construction (3.2%) and building services (2.9%), such as plumbing, electrical and heating. However, the highway, street and bridge construction industry, experienced a very slight average annual growth in employment (0.1%) during the period that was reviewed.

2.2 Services Sector

As mentioned earlier, employment in the services sector accounted for 78% of total employment in 2014, compared with 65% in 1976. Employment in the services-producing industries increased by 118% overall during the period that was reviewed. This represents an average annual growth rate of approximately 2.1%.

This strong growth is primarily attributable to two industries: professional, scientific and technical services, and business and building services, which saw their combined number of jobs increase fivefold between 1976 and 2014. This represents an average annual growth rate of 4.3%. These two industries accounted for 15% of employment in the services sector in 2014. Two other industries – accommodation and food services, and health care and social assistance – experienced strong

average annual growth at a rate of approximately 2.8% between 1976 and 2014. These industries accounted for 25% of jobs in the services sector in 2014.

2.2.1 Wholesale and Retail Trade

Together, the wholesale and retail trade industries accounted for approximately 20% of jobs in the services sector in 2014. These two industries posted lower average annual growth in employment than the services sector (1.8%), that is, 1.1% per year in retail trade and 1.5% in wholesale trade.

With the exception of 1999, employment increased at about the same rate in both industries. From 1998 to 1999, while employment in the retail trade industry increased at the usual pace (15,900 jobs), employment in wholesale trade experienced a rapid rate of growth of 16.4% (75,100 jobs).

In addition, new subsectors frequently emerge and rapidly develop within these two industries. For example, online shopping and mail-order businesses, which employed fewer than 1,000 people in 1995, employed 14,000 in 2014.

2.2.2 Transportation and Warehousing

Between 1987 and 2014, the transportation and warehousing industry posted a somewhat lower growth rate in employment than the growth rate for the services sector as a whole (1.3% versus 1.8%).

Table 2 shows the level of employment in 1987 and in 2014 and the percentage change for the main transportation and warehousing subsectors. During this period, some subsectors experienced strong average annual employment growth; these include warehousing (4.2%); support activities for transportation (3.8%), which includes port and harbour operations and airport operations; and couriers (2.7%). By contrast, average annual growth for subsectors such as rail transport and postal services declined (-3.3% and -1.1% respectively).

Table 2 – Employment in the Transportation and Warehousing Industry, 1987 and 2014, and Average Annual Percentage Change, 1987–2014, by Selected Subsector

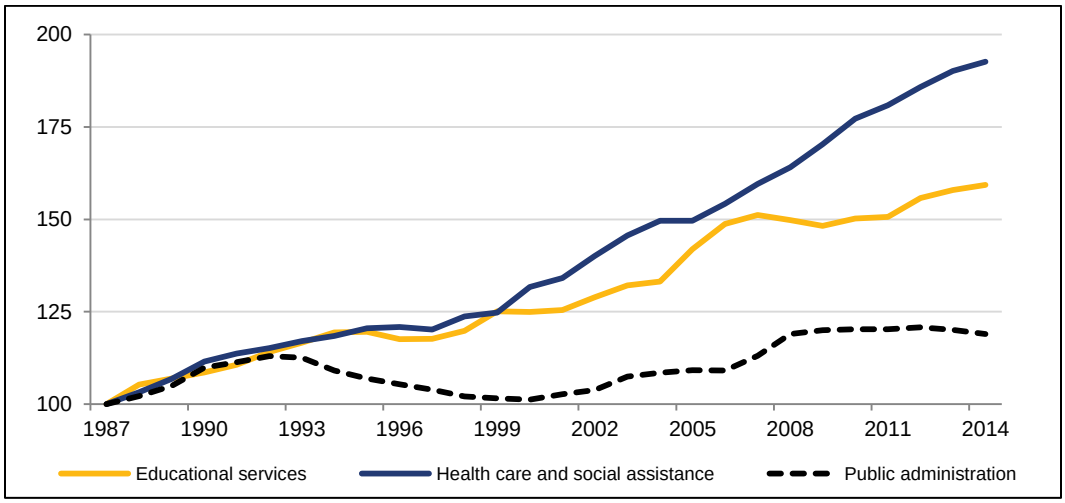
Subsector	1987	2014	Average Annual Change
Rail transportation	90,700	36,700	-3.3
Warehousing	18,500	56,200	4.2
Air transportation	54,000	59,500	0.4
Postal services	83,400	62,700	-1.1
Couriers	35,400	72,400	2.7
Support activities for transportation	43,300	117,400	3.8
Public transportation	108,400	170,300	1.7
Truck transportation	179,700	293,900	1.8
Transportation and warehousing	**634,000**	**896,800**	**1.3**

Source: Table prepared by the author using data obtained from Statistics Canada, "Table 282-0008: Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual (persons)," CANSIM (database), accessed 2 February 2015, and from data obtained directly from Statistics Canada.

2.2.3 Education, Health and Public Administration

Figure 4 shows job growth since 1987 in the major industries of educational services (1.2 million jobs in 2014), health care and social assistance (2.2 million jobs in 2014), and public administration (911,000 jobs in 2014).

Figure 4 – Index of Number of Jobs, Selected Industries, 1987–2014, Canada (1987 = 100)



Source: Figure prepared by the author using data obtained from Statistics Canada, "Table 282-0008: Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual (persons)," CANSIM (database), accessed 4 February 2015.

Over the course of the period that was reviewed, employment in the health care and social assistance industry grew at a steady, rapid pace (2.5% annually), which was greater than the average annual growth in the services sector (1.8%). This could have been the result of a number of factors, including population growth and aging.[7]

Employment increased at an average annual rate of 2.3% in the health care subsector: 3.6% in ambulatory health care services (physicians' and practitioners' offices, medical laboratories), 2.7% in nursing care facilities, and 1.7% in hospitals. There was also strong growth in practitioners' offices other than physicians and dentists (6.2%) and other ambulatory care services, such as ambulances (5.7%) and home health care services (4.9%).

In the social assistance subsector (527,800 jobs in 2014), average annual growth was also higher (3.2%). This industry includes primarily daycare services (average annual growth of 3.3%) and individual and family services (average annual growth of 3.6%), which include services for children and seniors, as well as psychological consultations.

Employment growth in educational services (1.7% annually) was similar to growth in the services sector (1.8%) over the course of the period that was reviewed. Growth was fairly well distributed among the subsectors of primary and secondary schools (1.4%), colleges and CEGEPs (1.6%) and universities (1.8%). The subsector of other educational and training institutions, which includes language, fine arts and athletics

schools, but not trade or management schools, saw strong average annual growth (5.2%) and accounted for 120,000 jobs in 2014.

Employment in public administration increased by 0.6% per year on average over the course of the period that was reviewed, which is lower than total employment growth (1.4%) and total growth in the services sector (1.8%). Annual employment growth in municipal administration (0.9%) was stronger than in federal administration (0.6%) and provincial administration (0.4%).

2.2.4 Other Services

There are a multitude of other services, which are covered in this section. The largest subsectors (at least 40,000 employees in 2014) that are of the greatest interest, either in terms of strong or weak annual employment growth or in terms of a change in trend, are presented in Table 3.

It is no surprise that certain subsectors, such as wired telecommunications and broadcasting (except Internet) are declining or experienced weak growth, as a result of the technological changes that have made them less important or obsolete.

Table 3 – Employment in the Other Services Industry, 1987 and 2014, and Average Annual Percentage Change, 1987–2014, by Selected Subsector

Subsector	1987	2014	Average Annual Change
Newspaper, periodical, book and directory publishers	81,700	59,100	-1.2
Broadcasting (except Internet)	46,200	40,200	-0.5
Wired telecommunications	131,100	131,600	0.0
Insurance carriers	144,600	147,400	0.1
Scientific research and development services	13,200	43,800	4.5
Waste management and remediation services	11,700	43,200	5.0
Management, scientific and technical consulting services	37,800	153,700	5.3
Gambling and recreation industries	10,700	46,500	5.6
Other financial investment activities	23,200	102,200	5.6
Business support services	20,600	98,800	6.0
Computer systems design and related services	48,200	327,400	7.4
Services	**8,699,200**	**13,905,100**	**1.8**

Source: Table prepared by the author using data obtained from Statistics Canada, "Table 282-0008: Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual (persons)," CANSIM (database), accessed 5 February 2015, and from data obtained directly from Statistics Canada.

By contrast, employment in certain subsectors experienced strong growth for similar reasons. For example, in computer systems design and related services, growth was 7.4%, which means that employment in this subsector increased sevenfold in 27 years. Another example (which is not in Table 3) is the software publishers subsector, in which there were, strictly speaking, no employees in 1998, but in which there were 15,700 employees in 2014.

3 SEASONALITY

Seasonality refers to recurring variations in employment data – an increase or decrease at the same time of year. A good example of the seasonal effect is the annual increase in the retail sales industry in the period leading up to Christmas.

With the help of statistical techniques, it is possible to make seasonal adjustments for a series of data by removing the specific effect of one month of the year in order to compare different months from the same year or from different years and to observe trends, without having the trends influenced by seasonal aspects.[8]

Some industries are more seasonal than others. Table 4 shows the average difference, in percentages and in absolute terms, between the raw data and seasonally adjusted data, for certain chosen industries.

For the total economy, the peak of the seasonal component is in July, with the raw data 3.4% higher on average than the seasonally adjusted data. This is primarily explained by the weather, tourism and the higher number of students working.

Table 4 – Mean Deviation, Minimum and Maximum (%), Between the Raw Series and the Seasonally Adjusted Series (%), Selected Industries, 1987–2014

Industry	Minimum		Maximum		Mean
	Month	%	Month	%	Deviation
Greenhouse, nursery and floriculture production	January	-31.8	May	27.4	18.0
Fishing, hunting and trapping	January	-20.6	August	22.6	15.9
Crop production	February	-20.1	August	22.7	14.9
Heavy and civil engineering construction	February	-19.4	August	20.7	14.2
Forestry and logging	April	-27.6	August	16.9	12.5
Information industry	September	-2.5	July	2.5	1.1
Metal ore mining	April	-1.9	July	1.8	1.1
Finance and insurance	November	-1.3	August	2.2	1.1
Professional services	September	-1.6	July	1.2	0.9
Health care and social assistance	September	-1.3	July	2.0	0.9
Total economy	**January**	**-2.9**	**July**	**3.4**	**2.0**

Source: Table prepared by the author using data from the Labour Force Survey, obtained directly from Statistics Canada. The data were seasonally adjusted by the author using the X-12 methodology in EViews software.

4 ECONOMIC CYCLES

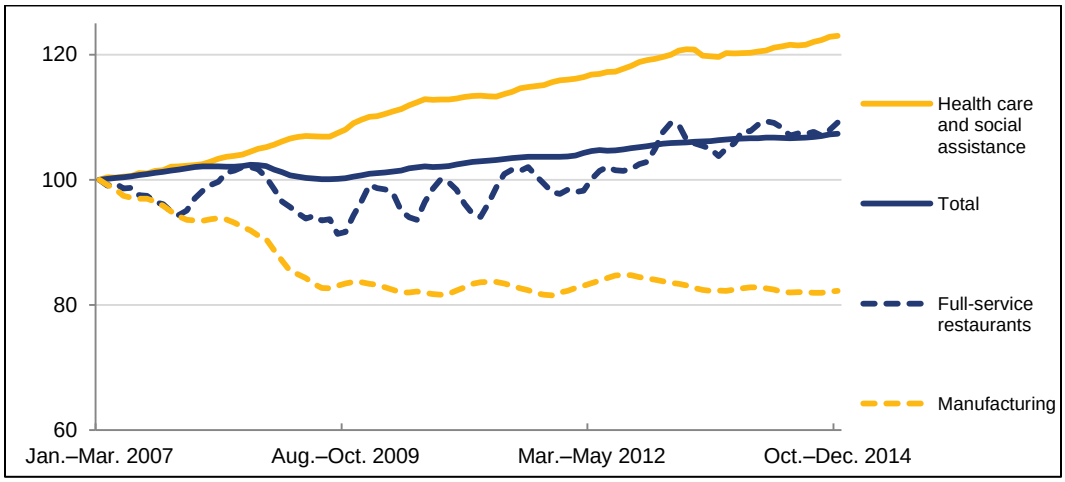
Some industries are more affected than others by recessions. For example, during an economic downturn, consumers generally continue to purchase basic necessities (food, drink), students continue to go to school and the public continues to use government services. However, people may postpone the purchase of a new car, or they may visit restaurants less frequently. That is why industries such as health care and education are generally less affected by recessions than manufacturing and other so-called less essential services.

The industries, then, can be divided into four categories with respect to employment trends since 2007:

- Industries that experienced little or no effect from the recession and that have rapidly continued their growth. These are industries experiencing long-term growth or that are relatively immune to economic fluctuations. These would include industries such as health care, as well as professional, scientific and technical services.
- Industries that reacted in a way resembling that of the total economy, with a moderate decline in employment and a slow, steady recovery. For example, in the administrative services industry, employment saw a 6.4% decline from January–March 2008 to October–December 2009, but its level at the end of 2014 was 7.6% higher than it had been at the beginning of 2007.
- Industries in which employment had a more dramatic decline, which may have been experienced in two or three periods, just like the recovery. For example, in the support activities for the mining and oil and gas extraction industry, employment was 6.9% higher at the end of 2014 than at the beginning of 2007, although it experienced many more ups and downs than the total economy.
- Industries in decline over the long term, which the recession affected more or less than the others, but that continue to decline. A number of manufacturing subsectors belong to this category, as well as the fishing, hunting and trapping industry, which lost approximately one third of its jobs between 2007 and 2014.

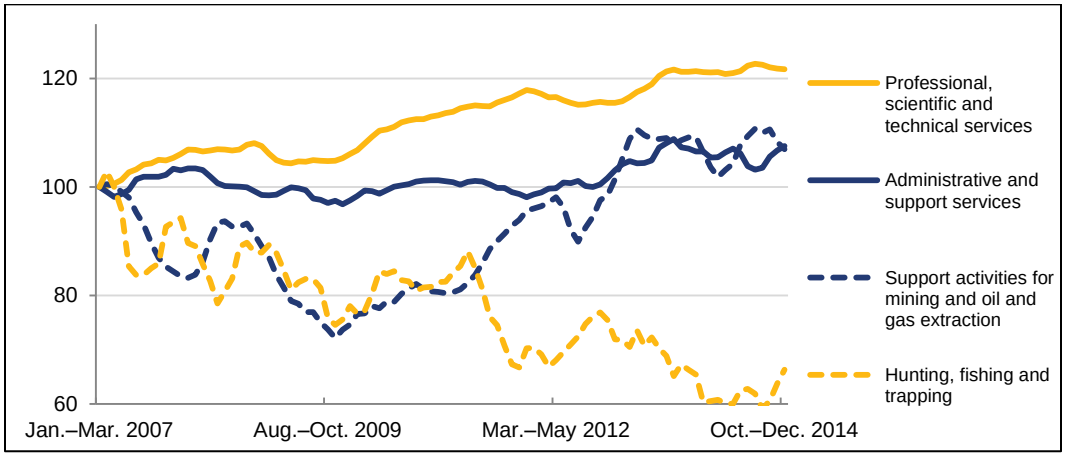
Figures 5 and 6 show employment for certain industries, from 2007 to 2014.[9]

Figure 5 – Index of Number of Jobs, Selected Industries, 2007–2014, Canada (January to March 2007 = 100)



Source: Figure prepared by the author using data from the Labour Force Survey, obtained directly from Statistics Canada. The data were seasonally adjusted by the author using the X-12 methodology in EViews software. The data also represent an average over three months.

Figure 6 – Index of Number of Jobs, Selected Industries, 2007–2014, Canada (January to March 2007 = 100))



Source: Figure prepared by the author using data from the Labour Force Survey, obtained directly from Statistics Canada. The data were seasonally adjusted by the author using the X-12 methodology in EViews software. The data also represent an average over three months.

NOTES

1. The Canadian employment figures in this paper are based on Statistics Canada's *Labour Force Survey (LFS)*, CANSIM (database), tables 282-0008 and 282-0088 (accessed 29 January 2015, following publication of the revised LFS), and on other LFS data obtained directly from Statistics Canada.
2. For additional information on the decline of the Canadian manufacturing sector in terms of GDP, see Mathieu Frigon, *Exchange Rate Fluctuations and the Competitiveness of the Canadian Manufacturing Sector*, Publication no. 2013-19-E, Parliamentary Information and Research Service, Library of Parliament, Ottawa, 22 April 2013.
3. The textile mills subsector includes fabrics, textiles and fabric coatings, while the textile product mills subsector covers carpets and rugs, curtains and textile bags.
4. The forestry sector includes forestry, logging and support activities for forestry. Among other things, the sector includes the gathering of forest products, timber tract operations, forestry nurseries, cutting and transporting timber, and the production of hewn and rough wood.
5. Agriculture includes crop production, animal production, support activities for agriculture and a subsector called "agriculture, not elsewhere classified."
6. The support activities for the mining and oil and gas extraction sector includes exploration for minerals, and oil and gas contract drilling.
7. See Canadian Institute for Health Information, *Health Care Cost Drivers: The Facts*, Ottawa, October 2011.
8. The technique involves eliminating or distributing the seasonal effect of one or more months over the period of a year in order to compare various periods in the year and avoid spikes. The adjustment factor is different for each month within the year (as a result of its specific nature), but is constant for the same month from one year to the next.

9. Figures 5 and 6 use the seasonally adjusted data and also show the averages of three consecutive months, in order to be more reliable and to ensure that the data is less volatile, especially with respect to the smaller sectors.