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Insights on Canadian Society

Employment changes across industries during the downturn and recovery

by Sharanjit Uppal and Sébastien LaRoche-Côté

April 2013



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|----------------|--|
| . | not available for any reference period |
| .. | not available for a specific reference period |
| ... | not applicable |
| 0 | true zero or a value rounded to zero |
| 0 ^s | value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded |
| P | preliminary |
| r | revised |
| X | suppressed to meet the confidentiality requirements of the <i>Statistics Act</i> |
| E | use with caution |
| F | too unreliable to be published |
| * | significantly different from reference category ($p < 0.05$) |

Corrections have been made to this product

The publication has been reloaded on April 25, 2013

Please take note of the following change(s):

The article "Employment changes across industries during the downturn and recovery" was reloaded on April 25th, 2012. A classification error was notified in Table 2, which mainly affected the distribution of 'pro-cyclical' industries during the last three downturn and recovery periods (with little variation in the results for the latest downturn). These revisions affect data in Table 2 and the associated text.

We regret any inconvenience this may have caused.

Employment changes across industries during the downturn and recovery

by Sharanjit Uppal and Sébastien LaRoche-Côté

Overview of the study

During downturns and the subsequent recovery periods, not all industries follow a cyclical pattern of job losses followed by sustained growth. Some industries may lose ground in the downturn and remain stagnant during the recovery, while others register net gains during both the downturn and the recovery. This study examines employment changes across industries over the course of the last three downturns and subsequent recoveries. It also examines the sectors that have been drivers of job growth since the end of the most recent recovery period.

- After the recent downturn, during which employment declined by 431,000 (from October 2008 to July 2009), the labour market took 18 months (until January 2011) to recover all jobs that had been lost.
- In October 2008—when the downturn began—23% of employed individuals were in industries—like health care services—that expanded during both the downturn and the recovery. Another 47% were in industries—like professional, technical and scientific services—that either expanded during the recovery, significantly recovered from their losses, or did not experience large employment fluctuations.
- Conversely, 20% were in industries that declined during both the downturn and the recovery, or did not recover from their losses during the recovery (like manufacturing). The rest (11%) were in industries that followed a countercyclical pattern—growing during the downturn and downsizing during the recovery.
- In the 1990s, 448,000 jobs were lost during the downturn and the labour market took 25 months to recover. In April 1990, when the downturn began, more workers (31%) were employed in industries that either declined both during the downturn and the recovery or did not fully recover after the downturn.
- Since the end of the recent recovery period (from January 2011 to February 2013), employment increased by 463,000. Nearly three-quarters of employment gains were in accommodation and food services, health care and social assistance, educational services, and construction.

Introduction

In the late 2000s, most of the world's economies experienced a slowdown. The global economic decline began in December 2007 and took a sharp turn in September 2008. Canada itself was not immune from this slowdown. Output in Canada started to decline in the third quarter of 2008 and reached a low point in the second quarter of 2009.¹ Similarly, employment started declining in the third quarter of 2008 and reached a low point in the third quarter of 2009.²

During recovery periods, employment gains do not always move in tandem with output gains. Following the recession of the early 1990s, for example, employment growth resumed a year and a half after output started expanding, giving rise to a period of 'jobless recovery.'

Following the more recent recession, employment and output recovered at almost the same pace—output growth resumed in the second quarter of 2009 and was followed by employment growth the following quarter, suggesting that conditions faced by the labour market were different in the late 2000s.

Employment changes across industries during the downturn and recovery

One hypothesis to explain the longer recovery in the 1990s is that job changes were more transformative or 'structural' during that period. Structural changes are labour market changes that imply a shift of resources across industries, requiring many workers to retrain or develop new skills. In contrast, 'cyclical' flows are less transformative in nature, with workers more likely to return to their former jobs or find comparable employment in similar industries.³ Information about the nature and extent of such changes is therefore important, especially for policy makers and central bankers.

One key indicator of labour market transformation during recessions is the degree of employment changes across industries.⁴ On one hand, if most employment flows that occur within industries are driven by cyclical factors, fewer changes are likely affecting the labour market. On the other hand, if employment declines in some industries have been followed by gains in others, more fundamental changes are probably taking place in the labour market.

Using data from the most recent Labour Force Survey (see *Data sources, methods and definitions*), this report examines employment patterns across industries during the recent recession, and provides comparisons with the recessions of the early 1980s and early 1990s. It also looks at the drivers of employment growth during the most recent post-recovery period.

Employment levels recovered faster in the 2000s

Before looking at job flows across industries, it is useful to examine the number of months from when employment losses first began to when employment levels reached

their low point (i.e., the duration of the employment downturn) and the number of months from the employment low point to when employment levels returned to pre-recessionary levels (i.e., the duration of the recovery).

During the recent downturn, employment levels started falling in October 2008 and hit a low point 9 months later, in July 2009 (Table 1). In total, employment declined by 431,000, or 2.5% of the workforce. It took 18 months to reach pre-recessionary employment levels—meaning that employment had climbed back to its pre-downturn level by January 2011.

In contrast, the downturns of the early 1980s and 1990s were more severe and prolonged. Starting in June 1981, the economy shed 5.4% of its workforce over a period of 17 months, and took another 23 months to recover the losses. The downturn of the 1990s was even more prolonged as it took 28 months to reach a low point and another 25 months to regain the 3.4% decline in employment.

The more severe job losses of the 1980s and the protracted recovery period of the 1990s raise the possibility that the Canadian economy faced a higher degree of transformation at the time. While

cyclical changes within industries may be less transformative (laid-off workers may be recalled to their old jobs or may find comparable employment with similar firms), employment changes resulting from changes in the industrial structure bring a different set of labour market challenges as more workers may need to develop new skills and competencies.

Employment changes across industries

Changes in the industrial structure can be studied by tracking employment patterns across industries during the downturn and the subsequent recovery.⁵ Cyclical changes in employment are evident when employment losses in an industry occur during recessionary periods but are reversed during the subsequent recovery. In contrast, structural changes may be evident when employment losses (or gains) occur during both the recessionary and the recovery periods of the business cycle.

Industries can be grouped into four categories based on the percent change in employment during the downturn period (from October 2008 to July 2009) and during the subsequent recovery period (from July 2009 to January 2011):⁶

Table 1 Duration of downturns and recoveries (in months)

	Duration of downturn	Duration of recovery	Employment losses during the downturn		
			Total	thousand	percentage
Beginning of downturn					
October 2008	9	18	27	431.3	2.5
April 1990	28	25	53	447.6	3.4
June 1981	17	23	40	611.5	5.4

Source: Statistics Canada, Labour Force Survey, 1981 to 1984, 1990 to 1994, 2008 to 2011. CANSIM table 282-0088.

Employment changes across industries during the downturn and recovery

1. pro-cyclical industries—declining during the downturn and growing during the recovery
2. countercyclical industries—growing during the downturn and declining during the recovery
3. industries declining during both the downturn and the recovery
4. industries growing during both the downturn and the recovery.

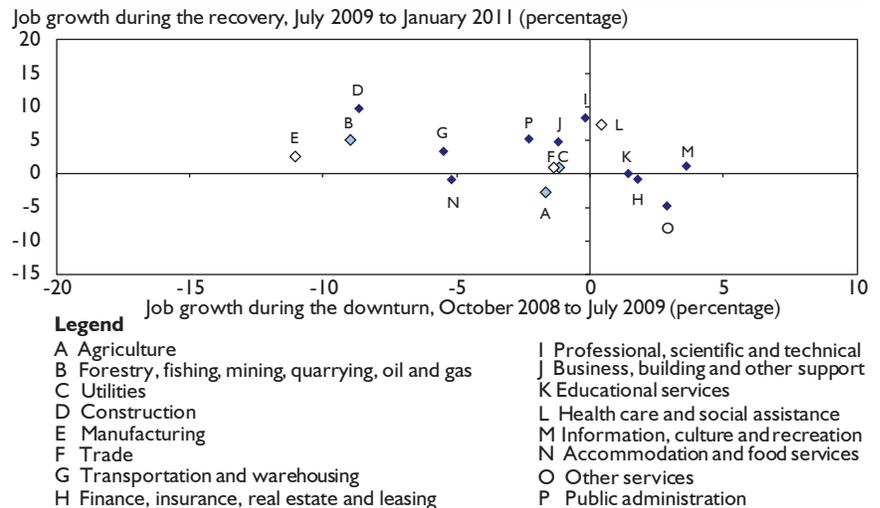
Using this classification, more than half of the industries (located in the upper left quadrant of Chart 1) were pro-cyclical, as they recouped jobs lost during the downturn. However, there was a lot of cross-industry variation among pro-cyclical industries.

Pro-cyclical industries can be further divided into three categories:

1. those that did not recover as much employment as they lost (losses at least two times the level of gains)
2. industries that eventually expanded after the downturn (gains at least two times the level of losses)
3. industries that experienced a significant degree of recovery or did not experience large employment fluctuations (less than 2% growth or decline).

During the recent downturn and recovery period, the only industry that clearly did not recover from its losses was manufacturing, which employed one-tenth of the entire workforce. During the downturn, manufacturing industries declined significantly (-11%) and recovered only slightly during the recovery (+3%).⁷

Chart 1 Employment change by industry, October 2008 to January 2011



Note: Industries shown in white represent employment shares of 10% to 15%, those in dark blue, shares of 4% to 7%, and those in light blue, shares of 1% to 2%.

Source: Statistics Canada, Labour Force Survey, October 2008 to January 2011. CANSIM table 282-0088.

Pro-cyclical industries that expanded faster during the recovery included professional, scientific and technical services; business, building and other support services; and public administration (which collectively employed more than 15% of the workforce). Employment in professional, scientific and technical services fell by less than 1% during the downturn but grew by more than 8% during the recovery period. Public administration contracted by 2% and was followed by a 5% growth.

The industries that regained comparable employment numbers after the downturn or experienced some degree of recovery included construction (a 9% loss followed by 10% gain); transportation and warehousing (a 5% loss followed by a 3% gain); and natural resources. Other industries, like utilities and

trade, did not experience major employment fluctuations over the period.⁸

Industries in the upper right quadrant are those that expanded during both the downturn and the recovery. This applied to three industries—educational services; health care and social assistance; and information, culture and recreation. Health care and social assistance, in particular, grew modestly during the downturn but by 7% during the recovery period—a trend consistent with the aging of the population and the rising demand for health services.⁹ In October 2008, nearly one-quarter of all workers were in industries that would eventually expand during both the downturn and the recovery.

Countercyclical industries are those that gained employment during the downturn and lost some during the recovery (lower right quadrant). In fact, two industries representing

Employment changes across industries during the downturn and recovery

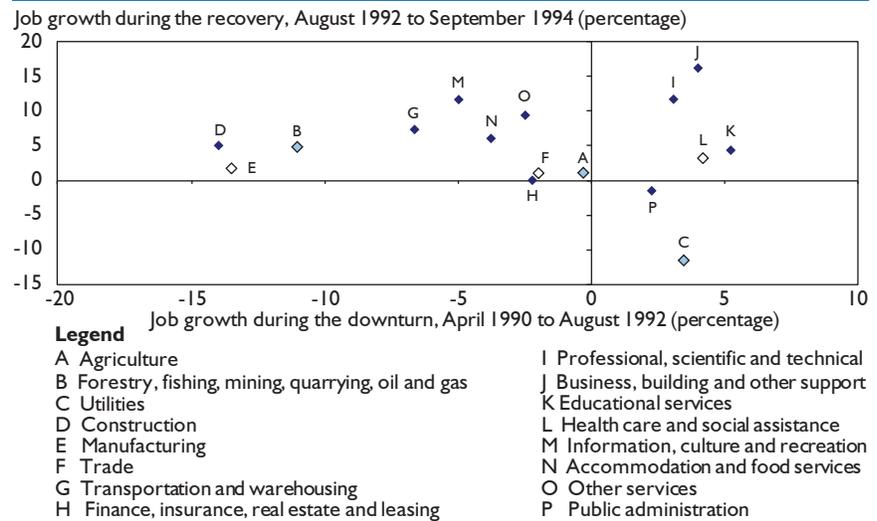
about 10% of the total workforce—finance, insurance, real estate and leasing and 'other' services (such as repair and maintenance, personal, religious) were countercyclical. Other services—which have high rates of self-employment—saw a 3% job gain during the downturn but lost nearly 5% as the labour market picked up steam. Such results are not necessarily a surprise because self-employment generally increases during recessions.¹⁰ Real estate—another sector with many self-employed workers—also picked up substantially during the recent downturn, hence explaining the growth in finance and real estate industries.

Finally, industries that were in the lower left quadrant declined during both the downturn and the recovery. In the late 2000s, two industries were categorized this way: agriculture, and accommodation and food services.¹¹ About 8% of the workforce was employed in these industries at the onset of the downturn.

More workers employed in industries that did not fully recover in the 1990s

How do these results compare with the previous two downturns? In the early 1990s, three industries experienced large declines in employment: manufacturing (-14%), construction (-14%) and natural resources (-11%), but employment did not fully recover in these industries (Chart 2). The 1990s, however, were characterized by significant employment growth in business, building, and other support services; and professional, scientific and technical services. Both sectors posted double-digit increases of 16% and 12%, respectively, during the recovery period.

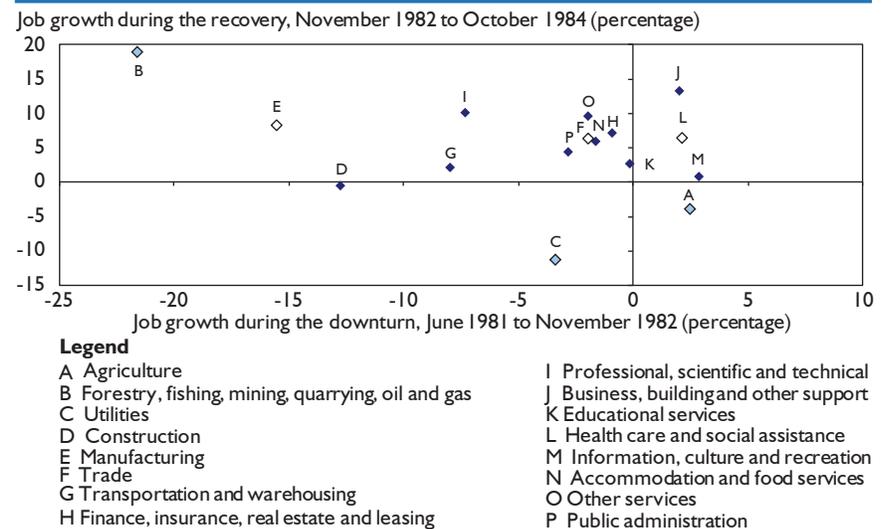
Chart 2 Employment change by industry, April 1990 to September 1994



Note: Industries shown in white represent employment shares of 10% to 15%, those in dark blue, shares of 4% to 7%, and those in light blue, shares of 1% to 2%.

Source: Statistics Canada, Labour Force Survey, April 1990 to September 1994. CANSIM table 282-0088.

Chart 3 Employment change by industry, June 1981 to October 1984



Note: Industries shown in white represent employment shares of 10% to 15%, those in dark blue, shares of 4% to 7%, and those in light blue, shares of 1% to 2%.

Source: Statistics Canada, Labour Force Survey, June 1981 to October 1984. CANSIM table 282-0088.

In the early 1980s, natural resources, manufacturing and construction

also recorded the largest declines: 22%, 16%, and 13%, respectively

Employment changes across industries during the downturn and recovery

(Chart 3). Contrary to the 1990s and 2000s, however, both natural resources and manufacturing industries recouped a large number of job losses during the recovery. Construction and utilities declined during both the downturn and the recovery—utilities, in particular, registered losses during the downturn (-3%) that extended well into the recovery (-11%). As was the case in the 1990s, business, building, and other support services experienced sustained growth, but to a lesser degree. However, professional, scientific and technical services had more of a cyclical pattern, losing 7% during the downturn but quickly expanding during the recovery (+10%).

During all three downturns, more workers were employed in industries that would eventually show pro-cyclical behaviour (Table 2). At the onset of the 1990s downturn, however, a larger percentage of employed people (25%) were in industries that did not recoup their losses, and another 7% were in constantly declining industries. In addition, many (23%) were employed in constantly growing industries, thereby suggesting that a large percentage of the Canadian workforce was exposed to significant changes during that period.

In comparison, in October 2008, more workers (47%) were employed in pro-cyclical industries that either made gains during the recovery, significantly recovered, or did not experience large fluctuations over the period. A large portion of the workforce was also employed in industries that gained employment both during the downturn and recovery (23%). In the 1980s, many people were employed in pro-cyclical industries that remained stable or expanded (more than 50%), but fewer were employed in industries that made gains during both the downturn and recovery (14%).

Such results are not necessarily a surprise, given that the Canadian economy took a lot more time to recover in the early 1990s than during the last recession, and that employment growth did not immediately follow output growth.¹² The protracted employment growth, the long recovery and the higher degree of industrial change all suggest that labour market changes in the 1990s were more fundamental.^{13,14}

What happened during the recent post-recovery period?

After reaching pre-downturn levels, employment continued increasing. Between January 2011 and February 2013, employment increased by 463,000 or 2.7% (Table 3).

Of the 463,000 increase in employment during the post-recovery period, 112,000 jobs were in accommodation and food services, followed by health care and social assistance (93,000).¹⁵ Educational services (65,000) and construction (64,000) also grew significantly over the period. Together these four industries accounted for nearly three-quarters of all employment gains in the 25 months that followed the recovery. The relatively strong growth in health care and social assistance and in educational services suggests that non-business industries played a prominent role in employment growth in the aftermath of the downturn.

Conversely, three industries recorded negative growth rates over the period—manufacturing contracted the most (-52,000), followed by utilities (-12,000) and public administration (-2,000). Changes were also unevenly distributed across occupations (see *Occupational changes*).

Table 2 More workers were employed in industries that did not recover in the early 1990s

	Beginning of the downturn		
	June 1981	April 1990	October 2008
	percentage		
Distribution of employment when the downturn began	100.0	100.0	100.0
Declining during the downturn, growing during the recovery (pro-cyclical)	74.8	63.2	58.5
Gains more than 2 times the level of losses	37.5	8.6	16.4
Recovery, near-recovery or stable employment variation	13.2	30.0	30.7
Losses more than 2 times the level of gains	24.2	24.5	11.4
Growing during both the downturn and the recovery	13.9	22.8	22.5
Growing during the downturn, declining during the recovery (countercyclical)	3.8	7.5	10.7
Declining during both the downturn and the recovery	7.4	6.5	8.3

Note: Industries that experienced less than 2% employment gains or losses over the period automatically qualified as 'stable.'

Source: Statistics Canada, Labour Force Survey, 1981 to 1984, 1990 to 1994, 2008 to 2011. CANSIM table 282-0088.

Employment changes across industries during the downturn and recovery

Table 3 Accommodation and food services, health care and social assistance, and educational services have accounted for a large portion of the increase since the recovery

	January 2011	February 2013	Change	
		thousand		percentage
Total employed, all industries	17,233.5	17,696.4	462.9	2.7
Agriculture	308.7	319.6	10.9	3.5
Forestry, fishing, mining, quarrying, oil and gas	333.3	351.1	17.8	5.3
Utilities	145.4	133.6	-11.8	-8.1
Construction	1,245.9	1,309.4	63.5	5.1
Manufacturing	1,791.8	1,740.0	-51.8	-2.9
Trade	2,663.0	2,703.1	40.1	1.5
Transportation and warehousing	833.7	861.4	27.7	3.3
Finance, insurance, real estate and leasing	1,083.3	1,108.0	24.7	2.3
Professional, scientific and technical	1,290.0	1,326.7	36.7	2.8
Business, building and other support	698.3	706.0	7.7	1.1
Educational services	1,215.9	1,280.8	64.9	5.3
Health care and social assistance	2,072.5	2,165.6	93.1	4.5
Information, culture and recreation	779.8	785.6	5.8	0.7
Accommodation and food	1,031.1	1,143.3	112.2	10.9
Other services	753.5	777.2	23.7	3.1
Public administration	987.4	985.0	-2.4	-0.2

Source: Statistics Canada, Labour Force Survey, 2011 and 2013. CANSIM table 282-0088.

Table 4 Distribution of employment across industries at the onset of the downturn (October 2008) and more than two years after the recovery (February 2013)

	October 2008	February 2013
	percentage	
Total employed, all industries	100.0	100.0
Agriculture	1.9	1.8
Forestry, fishing, mining, quarrying, oil and gas	2.0	2.0
Utilities	0.9	0.8
Construction	7.2	7.4
Manufacturing	11.4	9.8
Trade	15.6	15.3
Transportation and warehousing	5.0	4.9
Finance, insurance, real estate and leasing	6.2	6.3
Professional, scientific and technical	6.9	7.5
Business, building and other support	3.9	4.0
Educational services	7.0	7.2
Health care and social assistance	11.2	12.2
Information, culture and recreation	4.3	4.4
Accommodation and food	6.4	6.5
Other services	4.5	4.4
Public administration	5.6	5.6

Source: Statistics Canada, Labour Force Survey, 2008 and 2013. CANSIM table 282-0088.

Employment changes that took place during the downturn, the recovery and the two years that followed the recovery had an impact on the distribution of jobs across industries (Table 4). The proportion of employed individuals in manufacturing, for instance, declined from 11.4% to 9.8%, effectively extending a long-term

decline that began in the early 2000s.¹⁶ The proportion employed in health care and social assistance rose by a similar margin, from 11.2% to 12.2%, as did the shares of those employed in professional, scientific and technical services (from 6.9% to 7.5%). These two industries also expanded during the years that preceded the recent downturn.

Conclusion

The labour market is perpetually in a state of flux, with many jobs shifting away from some industries to others—a process that typically accelerates during recessions.¹⁷ As in past recessions, not all industries followed a cyclical pattern of employment loss and creation during the latest employment downturn and recovery. In October 2008, more than 20% of workers were employed in industries that would eventually grow on a constant basis (especially health care); another 20% were in industries that either declined all the time or could not recoup their losses (manufacturing), while nearly 50% were in industries that either fluctuated little over the period or created significantly more employment than they lost (such as professional, scientific and technical industries). During the 1990s, more workers (31%) had been employed in industries that either declined all the time or did not fully recover after the downturn.

In the two years corresponding to the most recent post-recovery period, job growth was concentrated in four industries: accommodation and food services;

health care and social assistance; educational services; and construction. Occupational data also indicated a relative concentration of growth in specific occupations, such as natural and applied sciences occupations; and trades, transport, equipment operators and related occupations (see Occupational changes). These newly created occupations require a fair degree of skill, with most of the newly created jobs requiring at least some college education training—particularly in trades and in engineering.

However, a good deal of reallocation also typically happens within industries (across firms of the same industry) to a greater extent than across industries. With the development of new administrative data sources, it will be interesting to see whether intra-industry labour reallocation was also a key feature of the recent downturn and subsequent recovery.

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Data sources, methods and definitions

This study uses data from the Labour Force Survey (LFS). The LFS is conducted every month to collect information about the labour market activities of the population at least 15 years of age, excluding residents of collective dwellings, persons living on reserves and other Aboriginal settlements, and full-time members of the Canadian Forces. Employed individuals are defined as those who had a job during the reference week of the survey.

According to the LFS, employment peaked in October 2008 in Canada, bottomed out in July 2009 and fully recovered in January 2011. Not all occupation estimates are seasonally adjusted—therefore results by skill level are based on non-seasonal data over a 2-year period (from January 2011 to January 2013). By definition, employment variations based on the same month are less likely to be affected by seasonal variations.

Occupational changes

Another way to analyze employment changes during the downturn and the subsequent recovery period is to study employment variations across occupations, again by looking at pro-cyclical, countercyclical, expanding during both the downturn and the recovery, and declining during both the downturn and the recovery.¹

Most occupation categories were pro-cyclical. Although losses occurred in occupations unique to processing, manufacturing and utilities; and trades, transport and equipment operators and related occupations (Chart A.1), both categories were able to recoup about 50% of the job losses during the recovery that followed. Similarly, management occupations shed 4% of their jobs and recovered 1% during the recovery. Other pro-cyclical occupations gained more during the

recovery compared with their losses during the recession. Employment in health occupations declined by less than 1% during the downturn, but was followed by a relatively strong growth of 9% during the recovery period.

Occupations in social science, education, government service and religion grew by almost 3% during both the recession and the recovery. None of the occupational groups went through a sustained decline over the period and there was one countercyclical occupational group—occupations in art, culture, recreation and sport.

Since January 2011, occupational groups have recorded varying increases in employment levels. (Table A.1). Natural and applied sciences and related occupations benefited the most by gaining 114,000 jobs. This group was followed by

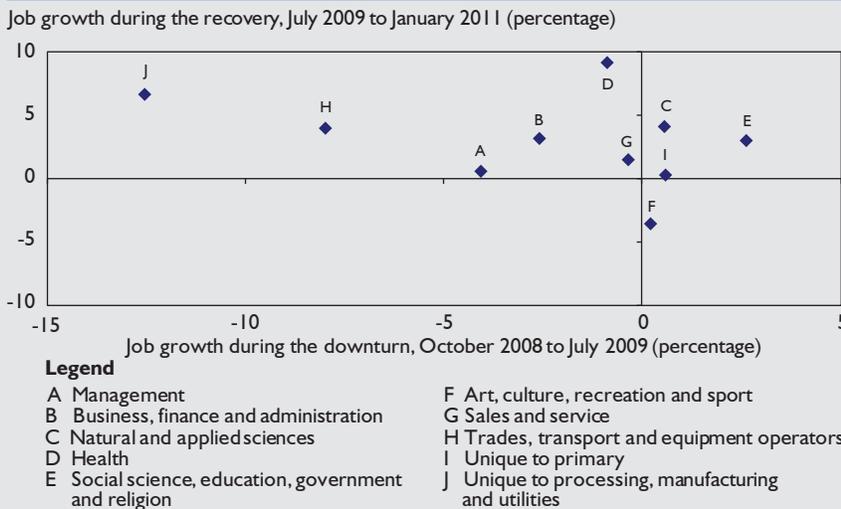
trades, transport, equipment operators and related occupations at 105,000. Natural and applied sciences were mostly concentrated in professional, scientific and technical industries. However, firms in this industry also shed many administrative jobs (business, finance and administrative occupations) at the same time, which explains why employment varied little over the period in professional, scientific and technical industries.

Finally, knowing the required skill levels of occupations with the greatest growth can be helpful to identify which skills are currently in demand. Human Resources and Skills Development Canada (HRSDC) classifies occupations into the following four groups based on required level of education:

1. management occupations
2. occupations that usually require a university education
3. occupations requiring a college education or apprenticeship training
4. occupations for which a high school education and/or occupation-specific training is sufficient, and occupations where on-the-job training is usually provided.

In the two years that followed the recovery (January 2011 to January 2013), occupations requiring a college education or apprenticeship training recorded the largest gains in employment—both in terms of level (267,000) and percentage (5%).² Occupations requiring a university education also grew by 120,000 (4%) over the period. Growth was more mitigated among occupations requiring a high school diploma or less (62,000 or 1%), whereas the number of management occupations declined slightly over the period (-1% or 18,000 individuals).

Chart A.1 Employment change by occupation, October 2008 to January 2011



Source: Statistics Canada, Labour Force Survey, October 2008 to January 2011. CANSIM table 282-0093.

Notes

1. Since data on comparable occupational categories are not available before 1991, it was not possible to derive similar statistics based on occupations for the early 1990s and the early 1980s.
2. This analysis could not be extended to February 2013 because seasonally adjusted data from which the four categories of skills were derived are not available. Consequently, the discussion on employment changes across skill categories is based on seasonally unadjusted data over the 2-year period from January 2011 to January 2013.

Employment changes across industries during the downturn and recovery

Occupational changes (continued)

Table A.1 Employment changes by occupation, January 2011 and February 2013

	January 2011	February 2013	Change	
	thousand	thousand	thousand	percentage
Total employed, all occupations	17,233.5	17,696.4	462.9	2.7
Management	1,509.2	1,502.9	-6.3	-0.4
Business, finance and administration	3,154.4	3,157.4	3.0	0.1
Natural and applied sciences	1,243.5	1,357.2	113.7	9.1
Health	1,137.7	1,183.3	45.6	4.0
Social science, education, government and religion	1,599.1	1,659.2	60.1	3.8
Art, culture, recreation and sport	525.0	595.2	70.2	13.4
Sales and service	4,178.3	4,261.6	83.3	2.0
Trades, transport and equipment operators	2,529.5	2,634.0	104.5	4.1
Unique to primary	539.9	557.4	17.5	3.2
Unique to processing, manufacturing and utilities	817.0	788.2	-28.8	-3.5

Source: Statistics Canada, Labour Force Survey, 2011 and 2013. CANSIM table 282-0093.

Notes

- See Cross 2011.
- See LaRochelle-Côté and Gilmore 2009.
- See Groshen and Potter (2003).
- Groshen and Potter (2003) examine layoff trends and job gains across industries during the 2001–2003 recession in the United States.
- A method largely inspired by Groshen and Potter (2003) was used to classify 2-digit NAICS industries based on employment variations during the downturn and the subsequent recovery. Employment changes at the 3-digit level could not be examined in the absence of seasonally adjusted data at that level. However, employment reallocation across firms within industries (i.e., intra-industry labour reallocation) is much larger than employment reallocation across industries (see Davis and Haltiwanger 1992). For a recent example using Canadian data, see Morissette et al. 2013.
- This is based on seasonally adjusted Labour Force Survey data by industry (see Statistics Canada 2013).
- The declines and increases in employment levels are calculated using the employment level at the start of the respective periods as the base. Hence, for example, a 1% increase in employment during the recovery does not fully offset a 1% decline in employment during the downturn.
- Interestingly, employment levels varied little across trade industries, which employed about 15% of the total Canadian workforce and remains one of the largest industrial groups.
- Health expenditures typically increase with age. A recent cost-driver analysis from the Canadian Institute for Health Information (2011) estimated that total per capita health expenditures were rising exponentially after age 65, from about \$5,000 (in 2008) per person age 65 to 69 to \$18,000 per person age 85 to 89. Furthermore, between 1998 and 2008, health care expenditures rose by 7.4% on average on a constant basis, with increases especially concentrated among older individuals.
- See LaRochelle-Côté 2010.
- Data were verified using the Survey of Employment, Payroll and Hours (SEPH), although the SEPH and LFS differ markedly in terms of reference period, data collection period, and population studied. For instance, the SEPH does not include self-employed workers. However, trends in labour market reallocation were mostly the same in industries that had a low proportion of self-employed individuals. Comparisons with industries that have higher portions of self-employed workers could not be made because self-employment is generally countercyclical, as shown in LaRochelle-Côté 2010.
- See Aaronson et al. 2004.
- The extent of industrial reallocation can also be quantified by the Lilien sectoral shift measure (see Lilien 1982; Leung and Cao 2009). A calculation using the Lilien measure from the month that

marked the beginning of the employment downturn to the month that marked the return to the pre-downturn level produced the following results: 0.072 in 1981–1984, 0.081 in 1990–1994, and 0.050 in 2008–2011, confirming the higher degree of industrial reallocation in the early 1990s.

14. The sources of structural changes in the labour market during the mid-1990s generated a good deal of commentary. At the time, the Canadian economy faced growing competition induced by trade agreements (see, for instance, Trefler 2004) and rising human capital growth that could have been fostered by labour market specialization and technological change (see Heisz et al. 2002). The labour market was also affected by high interest rates and sluggish product demand.
15. Recall that employment declined both during the downturn and the recovery in food and accommodation services.
16. See Bernard 2009. Between 1976 and 2012, the proportion of the workforce employed in manufacturing declined, even during periods of economic growth, from 19% in 1976 to 10% in 2012. On the other hand, some industries experienced continuous increases—professional, scientific and technical services, which employed less than 3% of the workforce in 1976 and more than 7% in 2012; and health care and social services, whose share increased from 8% in 1976 to nearly 12% in 2012.
17. See Figura 2002.

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