# Understanding the Literacy Market in Alberta: A Segmentation Analysis

**Authors**

**T. Scott Murray**

**Richard Shillington**

## Foreword

The following report has been produced by DataAngel Policy Research Incorporated under contract to Alberta's Advanced Education and Technology.

The report compares estimates of the demand for literacy skill to estimates of the available supply of literacy skill to provide estimates of literacy skill surpluses and shortages by detailed industry and occupation for Canada and each jurisdiction.

The report also provides an overview of what instruction would be required to eliminate the revealed literacy skill shortages, first order approximations of what such instruction would cost and estimates of the direct economic benefits that might be precipitated if the requisite investments were to be made.

For questions or matters of clarification readers are invited to contact:

T. Scott Murray

DataAngel Policy Research Incorporated
19 McIntosh Way
Kanata, Ontario
Canada K2L 2N9
Telephone: 1 613 240 8433
Email: dataangel@mac.com

## Executive Summary

Evidence is mounting that Canada's future economic success will depend upon finding ways to raise the average level of literacy in the adult population (DataAngel, 2009). Alberta's high level of dependence on inter-provincial and international trade in commodities implies that literacy skills will influence Alberta's economic prospects more than other jurisdictions.

Higher levels of literacy will help to support higher levels of adult learning and will increase the rate at which firms can adopt more knowledge and information- intense technologies of production and work organization.

Higher literacy levels can also be expected to reduce the incidence and costs of workplace injury and accident.

The resultant productivity growth will help maintain the competitiveness of Canada's firms in what is becoming a fiercely competitive global economy.

On a positive note Canada's overall average level of adult literacy skill is high relative to many of its trading partners (Statistics Canada and OECD, 2005)

Nevertheless a large proportion of Canada's adults do not appear to possess the level of skills that is needed for satisfactory job performance (HRSDC, 2008).

To make matters worse recent analysis suggests that the proportion of adults with less than adequate skill levels will remain more or less unchanged over the coming decades (CCL, 2008).

Raising average literacy skill levels, and reducing the proportion of adults with skills below that needed to do their jobs, will require higher levels of investment and participation in adult literacy programs.

This report attempts to shed light on the economic dimensions of the literacy problem in Canada.

The report does so by providing estimates of:

- the labour market demand for prose literacy by industry and occupation
- how the demand for prose literacy skill is projected to evolve over the coming decades in response to shifts in the occupational distribution of employment
- the supply of prose literacy that is available to the Canadian labour market
- the supply of prose literacy skill that is being utilized by industry and occupation
- the prose literacy skill shortages, balances and surpluses by industry, occupation and selected demographic groups
- the cost of eliminating prose literacy skill shortages through the provision of remedial instruction designed to raise them to the level of prose literacy skills associated with satisfactory job performance
- the direct economic benefits that could be precipitated by the elimination of prose literacy skill shortages
- the implied rates of return on investment by industry and occupation

The results of the analysis are striking.

Among other things the findings documented in this report confirm that:

### Literacy demand in Alberta

The labour market demand for literacy in Alberta is high.

At peak demand levels the Alberta economy generates a demand for 529.2 million points, or 12% of the total peak demand in Canada. Thus, the Alberta economy is responsible for a sizeable fraction of the total demand for literacy skill in Canada.

Ontario aggregate peak demand for literacy skill is a staggering 580 times larger than demand in Nunavut and is 1.65 times larger than the level of demand in Quebec, the second largest literacy market in Canada.

Alberta generates the fourth highest level of peak aggregate demand.

Jurisdictions differ in their levels of peak prose literacy skill demand. In most provinces peak aggregate demand exceeds the level of typical demand by typical by 8%.

Alberta aggregate peak demand is 7.4% higher than typical demand.

The average level of literacy skill demand per worker in Alberta is also average. Judged on a per employed worker basis, the Alberta economy demands an average literacy of 287 points at peak demand.

The Alberta demand for literacy skill by level under typical and peak demand conditions mirrors the national distribution:

> 54% of Alberta's peak literacy demand is at Level 3.
>
> At peak demand 15% of Alberta's jobs demand Level 2 prose literacy skill and 31% require Levels 4 and 5.

### How the demand for literacy skill is likely to change

National forecasts of projected employment growth suggest that it will be highly concentrated in occupations that demand high levels of literacy skill. This finding implies that employers will have difficulty in recruiting employees with the required skill levels and competition among provinces for inter-provincial migrants and immigrants will be fierce.

Further, the forecasts suggest that projected employment losses are highly concentrated in occupations that demand low levels of skill. This implies that the available pool of unemployed workers that will be shed by employers will have relatively low skills, well below the level needed by the newly created jobs.

### The impact of recent changes in employment on the demand for literacy skill in Alberta

Changes in Alberta's occupational distribution of employment observed between May, 2006 and September, 2008 appear to be positively skill-biased. Whether expressed in absolute terms, or as a proportion of 2006 employment, gains have been concentrated in jobs that demand higher average prose literacy skills and job losses have been concentrated in jobs that require lower average literacy skill. This pattern differs from New Brunswick where the skill intensity of employment has been falling sharply.

### The supply of literacy in Alberta

The supply of literacy skill in Alberta is large with Alberta residents having 11% of the total aggregate prose literacy supply in Canada.

The literacy levels of Alberta's employed workers compare favourably to other jurisdictions. Fully 763,760 adults, or 41% of employed workers, possess prose literacy skills at Levels 1 and 2, and 663,362 or 34% have Levels 4 or 5.

An estimated 108,209 Alberta adults in the experienced labour force (i.e. those who are either currently employed or who worked in the 5 years prior to the Census), or 46%, have prose literacy skills at Levels 1 and 2. This proportion is slightly more than is evident in the employed population in Alberta, a fact that suggests that the experienced labour force that is not currently in employment is slightly less skilled than their employed peers.

One measure of economic efficiency is the rate at which the economy utilizes the supply of experienced labour. At 89% Alberta has an average aggregate literacy utilization ratio, a fact that suggests that there is room for Alberta employers to rely upon drawing new entrants into the labour market as a means to meet rising demand for literacy skill.

### How literacy supply is expected to change over the medium term

In Alberta the absolute numbers of adults with skills below Level 3 is projected to grow by 181,587 from 1,051,413 to 1,233,000 from 2006 to 2016, or 17%. The Alberta population is forecast to grow by 43% over the same period.

Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 3%.

The absolute number of low skilled adults in Calgary is expected to grow by 91,000 from 317,000 to 408,000.

In Calgary the proportion of adults with Levels 1 and 2 skill is expected to shrink by 1% by 2016.

The absolute number of low skilled adults in Edmonton is expected to grow by 67,000 from 329,000 to 396,000.

In Edmonton the proportion of adults with Levels 1 and 2 skill is expected to shrink by 3% by 2016 from 44% to 41%.

These findings imply that the Alberta economy will not be able to depend on domestic supply to meet the rising literacy skill intensity of employment in Alberta implied in the COPS projections. Unless rising skill demands can be met through international and inter-provincial migration of workers, or through remedial literacy training, literacy skill shortages are bound to grow.

### The efficiency of the Alberta market for literacy

At the Canada level an average of only 66 percent of the available labour supply was being used in 2006. The fact that the Alberta economy currently makes use of 71% of the available supply of literacy skill implies that the Alberta economy is one of the most efficient in Canada at putting the available stock of labour to use. Thus, Alberta would have difficulty in realizing large GDP gains by making more effective use of the available pool workers without large increases in skill demand and more efficient labour market matching.

The Alberta economy demands 97% of the available supply of literacy skill possessed by employed workers. This suggests that the macro-economic performance of the Alberta economy could be improved if the economy made full use of the available supply.

Together these findings suggest a need for policies and programs that would serve to increase both the supply and the demand for literacy skill in Alberta.

When worker skills are matched to job demands by level Alberta has an aggregate literacy skill surplus of 13,409,350 points, or roughly 20 points per worker.

There is no aggregate shortage for jobs demanding Level 1 prose literacy skills in Alberta because, under peak demand, all jobs require level 2 or above.

The aggregate supply of literacy skill exceeds the peak demand for workers in Level 2 jobs in Alberta. Alberta workers in Level 2 jobs possess 14,359,050 more points of literacy than required under peak demand. This represents an average surplus of 12 literacy points per worker in Level 2 jobs, an amount associated with roughly half a year of education.

The aggregate supply of literacy skill exceeds the peak demand for workers in Level 3 jobs in Alberta. Alberta workers in Level 3 jobs possess 18,945,850 more points of literacy than required under peak demand. This represents an average surplus of 22 literacy points per worker in Level 3 jobs, an amount associated with slightly less than one year of education.

Alberta workers in Level 4 jobs lack a total of -10,611,900 literacy points, an average shortage of 45 points, roughly equal to the literacy skill gain associated with almost two additional years of education.

Alberta workers in Level 5 jobs lack a total of -9,283,650 literacy points, a skill deficit that represents an amount of 68 points per employee, roughly equivalent to the additional literacy normally gained through two and three quarters additional years of education.

Overall 46% of employed Alberta workers are in literacy skill shortage.

18 Alberta industries function with 50% or more of their employees with literacy levels below that demanded by their jobs at peak level.

### The social dimension of skill shortages in Alberta

Men and women in Alberta face roughly the same level of risk of being in skill shortage. Roughly half of both groups have prose literacy skills than are notionally required by their occupation under peak demand conditions 48% v.s. 45%.

Women have a higher probability of being in skill surplus, a fact that can be attributed to the fact that, as a group, women have higher average literacy skill levels. 32% of employed women in Alberta have surplus literacy skills v.s. 29% for men.

Immigrants in Alberta face a 16% higher risk of being in skill shortage than their non-immigrant peers. 59% of immigrants in the experienced labour force are in skill shortage compared to 43% of their non-immigrant peers.

Literacy skill shortages in the Alberta employed population are high for all age groups, ranging from a low of 40% to a high of 59%.

The rate of skill shortage rises steadily with age, a fact that largely mirrors the underlying relationship of literacy skill to educational attainment.

Employed youth aged 16 to 24 face the lowest level of risk of being in shortage but over a third of this group (40%) are judged to be in shortage.

Employed seniors aged 65 years of age and over face the highest risks of being in literacy skill shortage (59%). This finding suggests that the seniors who remain in the labour force have a very high probability of having low skills.

A large proportion, 44%, of employed aboriginal adults in Alberta are in skill shortage.

Employed Aboriginal adults in Alberta face a slightly lower risk of being in skill shortage than their non-Aboriginal peers – 44% v.s. 46%.

Non-official language adults face much higher levels of risk of being in literacy skill shortage than their official language peers. For example, 60% of these “other language” adults in the employed labour force are in skill shortage v.s. 43% of their English-speaking peers.

Without adjustment for differences in background characteristics Albertan workers are more likely than their peers in British Columbia and Saskatchewan to be in literacy skill shortage but are less likely than workers in other provinces.

With adjustment Albertan workers are 16% more likely to be in literacy skill shortage than the reference group of multi-lingual B.C. workers aged 65 and over with a degree.

### Size of literacy market segments in Alberta

The literacy market in Alberta, defined by the number of employed workers that do not possess the level of literacy required by their occupation, includes 959,000 potential learners.

The English language literacy market in Alberta includes the following market segments:

Table 5.1 Market shares by cost shares, English market in 48-Alberta, 2006

| Language and market segment | Number of potential learners | **Cost of remedial instruction ($M)** | **Share of cost by market segment** | **Proportion of literacy shortage by market segment** |
|---|---|---|---|---|
| **English** | | | | |
| Latent A1 | 64,250 | $303 | 19% | 7% |
| Latent A2 | 53,650 | $121 | 8% | 6% |
| Latent B1 | 29,050 | $143 | 9% | 3% |
| Latent B2 | 25,550 | $154 | 10% | 3% |
| Latent C | 280,750 | $534 | 33% | 29% |
| Latent D | 303,750 | $261 | 16% | 32% |
| Latent E | 161,500 | $68 | 4% | 17% |
| Latent F | 39,800 | $13 | 1% | 4% |
| | 958,300 | $1,597 | | |

The French language literacy market in Alberta includes the following market segments:

| | | | | |
|---|---|---|---|---|
| **French** | - | | | |
| Latent A1 | - | $- | 0% | 0% |
| Latent A2 | - | $- | 0% | 0% |
| Latent B1 | - | $- | 0% | 0% |
| Latent B2 | 550 | $- | 0% | 0% |
| Latent C | 450 | $1 | 0% | 42% |
| Latent D | 300 | $1 | 0% | 35% |
| Latent E | - | $0 | 0% | 23% |
| Latent F | | $- | 0% | 0% |
| | 1300 | $2 | | |

53% of workers in English literacy skill shortage in Alberta are classified in literacy market segments D, E and F. These learners display no evidence of weakness in the mechanics of reading i.e. they have adequate decoding and comprehension skills.

47% of workers in English literacy skill shortage in Alberta have discernible weakness in their decoding and comprehension skill.

9% of the English literacy market in Alberta is classified in market segments A2 and B2, the two classes dominated by immigrant women.

### Estimated cost of eliminating literacy shortages

An investment of $1.6 billion would be required to eliminate literacy skill shortages in the Alberta economy.

The English market shares in Alberta are asymmetrically distributed by remedial cost and market share.

Segment A1, which is dominated by Canadian-born men with less than high school education, represents 7% of the potential English learners in the Alberta literacy market but account for 19% of the estimated remedial costs

Segments C and D represent 61% of the potential English learners in the Alberta literacy account for an estimated 49% of the estimated remedial costs.

The following occupations in Alberta would require the largest investments:

| | |
|---|---|
| Sales & Service Occupations N.E.C. | $119 |
| Clerical Occupations | $116 |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | $111 |
| Retail Salespersons and Sales Clerks | $90 |
| Occupations Unique to Agriculture Excluding Labourers | $71 |
| Construction Trades | $57 |
| Machine Operators in Manufacturing | $51 |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | $48 |
| Mechanics | $46 |
| Professional Occupations in Natural and Applied Sciences | $41 |
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | $39 |
| Teachers and Professors | $39 |
| Professional Occupations in Business and Finance | $37 |
| Other Managers N.E.C. | $37 |
| Nurse Supervisors and Registered Nurses | $36 |
| Technical Occupations Related to Natural and Applied Sciences | $36 |
| Machinists, Metal Forming, Shaping and Erecting Occupations | $35 |
| Chefs and Cooks | $35 |
| Childcare and Home Support Workers | $31 |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | $31 |

The following 10 Alberta industries would require the largest investments:

| | |
|---|---|
| Retail Trade | $1 |
| Food Services and Drinking Places | $ |
| Mining and Oil and Gas Extraction | $ |
| Transportation | $ |
| Trade Contracting | $ |
| Crop Production | $ |
| Prime Contracting | $ |
| Wholesale Trade | $ |
| Primary and Secondary Education | $ |
| Hospitals | $ |
| Ambulatory Health Care Services | $ |
| Architectural, Engineering and Design Services | $ |
| Repair and Maintenance | $ |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | $ |
| Building Services | $ |
| Food Manufacturing | $ |
| Social Assistance | $ |
| Nursing and Residential Care Facilities | $ |
| Personal and Laundry Services | $ |
| Federal Government Public Administration (including Defence Services) | $ |

### The benefits of remediation and rates of return on investment

Were the Alberta economy able to absorb all of the newly created literacy skill and put it to good use then a $1.6 billion investment would precipitate a $9.7 billion increase in the earnings of employed Alberta workers. This increase represents an average rate of return on investment of over 500%.

Rates of return vary considerably by industry and occupation.

### Ability to workers to self-finance required level of remedial instruction

The proportion of low-income adults in Alberta varies considerably by English market segment, from a high of 14% (A2 and B2 – the two segments dominated by immigrants) to a low of 3% (F).

Over all English market segments in Alberta in literacy skill shortage 8% have low incomes, a low enough proportion to suggest that government finance may not be needed to precipitate high enough levels of participation and investment.

The low income French market segments in Alberta are too small to report.

### Conclusion

This report provides new evidence on the state of Alberta's markets for literacy.

Several important conclusions may be drawn from this evidence.

The labour market demand for literacy skill in Alberta is high and projected to grow rapidly over the coming decade.

The supply of literacy skill in Alberta is large but the proportion of workers with literacy skills at Levels 1 and 2 is projected to be stable in absolute terms and to remain virtually unchanged in proportional terms.

Unless new sources of literacy supply are tapped literacy skill shortages will grow.

The Alberta economy appears to be relatively inefficient in the sense that it does not make full use of the available supply of literacy skill. The Alberta economy uses 71% of the aggregate supply but the current distribution of employment demands only 97% of the literacy skill possessed by Alberta workers. These surpluses represent a huge untapped economic potential and argues for policies to increase the level of literacy skill demand in the Alberta economy, particularly in jobs that currently demand Level 2 literacy skill.

The economic potential of the Alberta economy is also constrained by the fact that an average of 46% of workers have literacy skill levels below those needed to do their jobs well.

Eliminating literacy skill shortages in Alberta would be expensive - an estimated $1.6 billion would be needed.

Such an investment would, however, generate an estimated $9.7 billion per year in additional earnings - an implied one-year return on investment of over 500%.

These benefits would flow from improved productivity associated with less worker error and material wastage, the adoption of more efficient work organization and production methods and lower rates of worker illness and accident.

The simple magnitude of these potential returns justify public investment in literacy despite the fact that most workers have incomes that are sufficiently high to self-finance the required literacy upgrading.

The real case for public literacy investment in Alberta rests, however, on the dire economic consequences associated with trying to compete in fiercely competitive global markets with large numbers of low skilled workers. Individuals and their employers might chose to invest but almost certainly not rapidly enough to avoid a lot of short-term economic pain. Faced with large numbers of low-skilled workers Alberta firms will chose to outsource production, will try to reduce labour costs or will simply be unable to compete. So realizing Alberta's full economic potential will depend critically on rapid and massive public investment in adult literacy.

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# Chapter 1: Introduction

This chapter provides readers with an overview of the issues that motivated the production of the report, how the report is organized and who might benefit from reading the report.

## The motivation for the report

Evidence is mounting that Canada's future economic success will depend upon finding ways to raise the average level of literacy in the adult population (DataAngel, 2009). Alberta's higher level of dependence on inter-provincial and international trade in commodities implies that literacy skills will influence Alberta's economic prospects more than other jurisdictions.

Higher levels of literacy will help to support higher levels of adult learning and will increase the rate at which firms can adopt more knowledge and information- intense technologies of production and work organization.

Higher literacy levels can also be expected to reduce the incidence and costs of workplace injury and accident. The resultant productivity growth will help maintain the competitiveness of Alberta's firms in what is becoming a fiercely competitive global economy.

Improved literacy levels are also expected to precipitate other benefits, including higher levels of population health and social and democratic participation and reductions in current levels of social inequality.

On a positive note Canada's overall average level of adult literacy skill is high relative to many of its trading partners (Statistics Canada and OECD, 2005)

Nevertheless a large proportion of Canada's adults do not appear to possess the level of skills that is needed for satisfactory job performance (HRSDC, 2008).

To make matters worse recent analysis suggests that the proportion of adults with less than adequate skill levels will remain more or less unchanged over the coming decades (CCL, 2008).

Raising average literacy skill levels, and reducing the proportions of adults with skills below that needed to do their jobs, will require higher levels of investment and participation in adult literacy programs.

Achieving higher levels of investment and participation will depend, in turn, on engaging Canada's employers. The fact that most adults with what are judged to be inadequate levels of literacy skill are working creates incentives for their employers to invest and suggests that instructional programs need to be tailored for the workplace.

There is reason to believe that failing to eliminate prose literacy skill shortages rapidly will seriously constrain the rate at which firms can adopt more productive technologies of production and work organization. Thus, a failure to invest rapidly could force Alberta firms to either reduce wages and benefits or outsource production to lower cost locales, both business strategies that would reduce employment and income levels in the province.

The recent economic turmoil in Alberta confirms many of the assumptions that underlie this line of reasoning. Job losses have been concentrated in sectors with low literacy levels, including the manufacturing and automotive sectors. If the arguments set out in this volume prove to be true then the processes of economic disruption and displacement have only just begun – reason enough for policy makers to pay attention to literacy.

### Who should use this report

This report seeks to improve the efficiency of Alberta's market for literacy goods and services by providing market intelligence to key industry players. More specifically, the report is designed to serve the information needs of six audiences.

First, the analyses will serve the needs of firms in the literacy "industry" by providing them with a nuanced portrait of the learning needs and characteristics of different groups of potential learners over the full range of industries and occupations. Armed with a clearer idea of the size of each of the important market segments and their revenue potential, institutions offering literacy goods and services can make better investment and marketing decisions.

Second, the analyses should help adult educators to engineer their products and services to better meet the specific needs of different groups of adult learners.

Third, the report provides politicians, and their policy advisors, with a clearer set of policy options related to adult literacy. The efficiency and effectiveness of Canada's current remedial literacy investments are limited by the fact that current data provides little insight into the learning needs of different groups of adult Canadians with limited literacy skill nor how these skill deficits are likely to influence the prospects of various industry sectors. The available data have not provided a clear sense of which groups of learners need government support and where individuals and their employers should support skill upgrading.

Fourth, the report is designed to provide adults with low literacy skills with a better sense of what their learning needs might be, what kinds of programs would be best suited to their needs, what level of investment would be required for them to reach the level needed to do their jobs and what economic benefits they might expect as a result.

Fifth, the report is designed to serve the needs of Alberta's employers, including the industry associations, sector councils and other groups that focus on the collective needs of their members. Armed with a clear idea of the magnitude of the literacy challenge within their respective industries and what level of investment would be required to eliminate any prospective skill shortages.

Finally, the report has been designed to meet the needs of the voting public. Despite the overwhelming evidence to the contrary, literacy has not been high on the public or private agenda. It is only once the voting public understands how much our economic future depends upon raising adult literacy levels that politicians will be willing to invest more public resources in the problem.

In meeting the needs of these audiences the report offers answers to a series of fundamental questions, including:

- What groups of Alberta adults need what kinds of help to raise their literacy levels?
- What kinds of literacy programs would best meet the needs of the different kinds of learners in Alberta?
- Which industries and occupations have the highest proportions of workers with inadequate literacy skills?
- Which groups of Alberta adults have the financial resources to help themselves?
- Which groups of adults have employers who could, and should, bear the cost of upgrading their skills?

### The organization of the report

To meet the objectives set out above this volume has been divided into six chapters.

**Chapter 1** introduces the report's objectives and organization.

**Chapter 2** draws on Human Resources and Skills Development Canada's Essential Skills Profiles by occupation to provide a profile of the current demand for literacy skill in Alberta. The analysis uses the distribution of employment by industry and occupation observed in the 2006 Census of Population. The chapter also uses data from the Canadian Occupational Projection System (COPS) to provide a sense of how expected shifts in the distribution of employment are likely to transform demand over the coming decade. Finally the chapter employs data from the monthly Labour Force Survey to explore how recent shifts in the distribution of employment by occupation have influenced the demand for literacy skill in the Alberta economy.

**Chapter 3** uses data from the 2003 International Adult Literacy and Skills Survey (IALSS) and the 2006 Census of Population to provide a profile of the current supply of literacy skill in Alberta by industry and occupation. The chapter also summarizes how the supply of literacy skill is likely to change over the coming decade based upon a set of literacy projections developed by DataAngel Policy Research for the Canadian Council for Learning.

**Chapter 4** compares current literacy supply and demand with a view to identifying the numbers of workers within each industry and occupation with skills at, below or above the desired level of literacy skill. Results are presented by occupation group and industry for the employed, the unemployed and those who worked in the past 5 years. These data will identify those sectors whose skill levels place them most at risk.

**Chapter 5** draws upon data from the 2003 International Adult Literacy and Skills Survey (IALSS), the International Survey of Reading Skill (ISRS) and the 2006 Census of Population to provide a more nuanced profile of the learning needs of adults with inadequate levels of literacy skill. The chapter presents first order approximations of the cost of raising skills to the desired levels for each industry.

**Chapter 6** summarizes the study's main findings and provides readers with an interpretation of what the findings imply for individuals, firms, literacy organizations, developers of literacy products and services and public policy.

The report is supported by four annexes.

**Annex A** provides the statistical tables upon which the figures are based.

**Annex B** provides full references for publications that are cited in the body of the document.

**Annex C** documents the methods that were used to generate the profiles of learning needs by industry and occupation.

**Annex D** acknowledges the individuals that contributed to the report.

#### Notes to readers

The interpretation of the estimates presented in this report depends on the following notes to readers. Readers are encouraged to read them carefully before proceeding.

1. The estimates of literacy skill demand by occupation included in this report are based upon the HRSDC's Essential Skills Profiles by occupation. The ES Profiles include two literacy skills – reading text and using documents. The report uses the reading text profile data. Analyses based upon document use would give roughly the same results because of the high correlation between the two skill domains. At the time of writing ES Profiles were only available for a subset of occupations, mostly occupations from the lower end of the skill distribution. For those occupations that have yet to be profiled the level of prose literacy demand was set to be the average level possessed by workers employed as of May, 2006, the Census reference period.
2. The ES profiles are of varying vintages and reflect skill demand at the point at which the occupation was profiled. Skill demand in particular occupations may have increased or decreased since the profile was undertaken in response to changes in technology, work organization or re-distributions of duties. It is generally assumed that the overall level of skill demand is rising in Canada. If this is the case then the

estimates of skill shortages presented in this report should be interpreted as the minimum level needed to eliminate literacy-based constraints on labour productivity. Nevertheless, literacy skill demand is falling in some industries and occupations, a fact that would tend to bias the estimates of skill demand upward. Since the balance between these two trends is unknown the currency of the ES profiles will have an unknown effect on the reliability of the demand estimates used in this report.

3. The ES profiles identify two levels of prose literacy proficiency that are associated with satisfactory job performance – the level typically demanded by the job and a level needed on an occasional basis. In the ES schema this latter level is known as the complex level. For the purposes of this analysis skill shortages are defined using the more demanding complex level. This is also referred to as the peak level in this report.

4. The estimates of literacy skill supply by industry and occupation were based upon prose literacy data derived from the 2003 International Adult Literacy and Life Skills Survey (IALSS). Prose literacy scores were imputed onto individual records from the 2006 Census of Population for each adult aged 16 and over that was administered the 2B long form using the relationships observed between proficiency and individual characteristics in the 2003 International Adult Literacy and Skills Survey (IALSS) assessment. These relationships are known to change slowly so the fact that the relationships are as observed in 2003 and applied to the distribution of characteristics observed in the 2006 Census of Population is expected to have little impact on the estimates of skill supply.

5. The definition of reading text and prose literacy derived from the ES Profiles and the Census are identical and, in principle, the two data sources share the same proficiency levels. The IALSS, however, uses an explicit level of mastery of 80% i.e. to be placed at a particular proficiency level one must have an 80% or better probability of getting test items of that level of difficulty correct. The ES Profiles do not impose an explicit mastery level.

6. The estimates of the cost of raising literacy skill are based on increasing prose literacy skill to the lower bound of the "complex" proficiency level identified by the ES profiles. Thus, the cost estimates represent the minimum condition that satisfies the skill constraint.

7. The estimates of prose literacy skill supply presented in this report are based on the population aged 16 and over observed in the 2006 Census of Population. These estimates differ from 2003 IALSS estimates previously published by Statistics Canada. Most of the observed differences are associated with the fact that the Census-based estimates include several population subgroups that were excluded from IALSS by design, including residents of Indian Reserves, Members of the Armed Forces and inmates of institutions.

8. The ES profiles depend on very small purposive samples of jobs in each occupation. As such they were not designed to provide statistically representative estimates. In addition, the assignment of the levels of literacy skill demand in ES profiling exercise are based upon task descriptions that have not been empirically validated. Thus, the estimates of literacy skill demand, and associated estimates of skill shortages, should be interpreted as indicative, rather than definitive.

9. The estimates of literacy skill demand produced for this report ignore skill demand associated with job vacancies and thus may under-estimate the true level of literacy demand.

## Chapter 2: The economic demand for literacy skill in Alberta

Literacy – the ability to understand and apply information gleaned from the printed word – has been shown to exert a profound impact on a range of social and economic outcomes.

Differences in average adult literacy level have been shown to exert a significant influence on key indicators of economic success, explaining as much as 55% of differences in the long term growth rate of GDP per capita and productivity growth at the national and international level (Coulombe, Tremblay and Marchand, 2004; Coulombe and Tremblay, 2006; Coulombe and Tremblay, 2006). The same research also suggests that the distribution of adult literacy skill has also influenced the long term economic success of Canada and its economic peers. Specifically, the higher the proportion of adults with very low literacy skill, the lower overall rates of long term GDP growth.

Research has also established a strong relationship between literacy and a range of outcomes at the individual level.

Differences in literacy skill are associated with large differences in employability, wage rates, income and reliance on social transfers, such as social assistance. Adults with higher literacy skills work more, experience less unemployment, earn more, spend less time unemployed and rely less on government transfers (Osberg, 2000; Green and Riddell, 2001; Green and Riddell 2003; Green and Riddell 2007; Raudenbush and Kasim 2002, Statistics Canada and the OECD, 2005).

Literacy has been shown to have an impact on the success of firms. Literacy contributes to effective communication and increases overall productivity. Literacy skill has been shown to influence the acquisition and application of information and communication technologies in daily life, including the workplace. Adults with high levels of literacy are much more likely to become proficient users of these technologies, and are much more likely to find themselves in high wage stable jobs, a clear sign of literacy's economic value to firms (ETS, 2003). Higher levels of literacy increase employee retention and reduce the incidence and severity of workplace illness and accident (Murray and McCracken, 2008).

It has also been suggested that higher literacy levels would reduce the cost of delivering public goods and services such as health and education, or at least would make existing tax expenditures more productive.

Literacy is also intimately related to the efficiency and effectiveness of the learning process itself. Students who acquire sufficient literacy skills are able to become independent learners and hence increase the productivity of the educational process enormously. Differences in literacy skill have also been shown to have a profound influence on various aspects of educational success including the probability of dropping out of high school, the probability of high school completion, post-secondary participation, the level of post-secondary participation, the probability of graduation and the level and intensity of participation in formal adult education and training (Willms, 2003; Knighton and Bussiere, 2006; Rubensson and Desjardins, 2007).

Literacy has also been linked to individual health outcomes including the probability of experiencing illness, the length of recovery, the cost of treatment and the age at death. Individuals with low literacy skill get ill more often, experience more workplace illnesses and accidents, take longer to recover, experience more mis-medications and die younger (Rudd, Kirsch, Yamamoto, 2004).

Finally, literacy has been shown to have a strong impact on the degree of engagement in the broader society. Adults with lower literacy skill levels participate less in community activities, volunteer less and are less likely to vote (Statistics Canada and OECD, 2005; HRSDC and OECD 2000).

Level 3 has been identified as the proficiency level needed by students to support independent learning and by adults to compete fully and fairly in the emerging global knowledge economy and information society (Statistics Canada and OECD, 1995).

Level 3 skills are known to be associated with satisfactory job performance in the overwhelming majority of Canadian occupations, with the effective use health information and with full and active participation in the community and the overall society (HRSDC, 2006; Murray, Rudd, Kirsch, Yamamoto, Clermont and Grenier, 2006; Statistics Canada and OECD, 2005).

This evidence leaves little doubt that literacy is socially and economically important. Canada's labour markets, education system, health system and social system recognize and reward individuals with higher skills – so much so that one can think of these markets as engines for creating inequality in some of the things Canadian's value most – wealth, health, learning, self reliance and belonging.

The evidence also suggests that literacy skill will become increasingly important in the future (Murray and McCracken, 2008; Canadian Council for Learning, 2007).

The global supply of literacy is rising rapidly in response to massive educational investments. Access to a skilled and literate workforce allows firms in the developing world to compete on both price and quality. This places intense price pressure on Canadian firms and creates significant financial incentives for firms to move production to lower cost countries.

Markets for goods and services are increasingly global, offering huge opportunity and economies of scale to those firms able to compete.

Markets for key inputs – financial capital, technology and high end human capital – have gone global, effectively increasing the relative importance of the skills of the workforce for both competitiveness and public policy.

Confronted with rapidly rising competition, Canadian firms have few options. One of the few ways in which they can remain competitive is by adopting more efficient work organizations and technologies. By definition, these work organizations are more knowledge and information-intense and, thus, demand workers with much higher levels of essential skills, most notably higher literacy levels.

Canada is one of the few countries in the world that has a statistical system for establishing the level of literacy skill that is needed to support satisfactory job performance. The system provides an estimate of the skill demand for nine "essential" skills, including reading text and document use, for each of the 576 occupations identified in Canada's National Occupation Classification (NOC).

This chapter begins by presenting estimates of the level of literacy skill demand by industry and occupation based upon the Essential Skills Profiles (ESP) (see text box) and the distribution of employment by industry and occupation revealed by Statistics Canada's 2006 Census of Population.

### The Essential Skill Profiles

Human Resources and Skills Development Canada (HRSDC) has funded the Essential Skills Research Program (ESRP). One of the key products produced under the program are a set of Essential Skills Profiles, a statistical system designed to provide estimates of skill demand for each of the 576 occupations identified in Canada's National Occupational Classification (NOC). Each profile reveals the level of nine "essential" skills is associated with satisfactory job performance in that occupation. Reading text and document use are two of the essential skills included in the profiles. The ES profiles provide two proficiency levels that are associated with satisfactory job performance – a usual level and an occasional level.

Interested readers may see http://www.hrsdc.gc.ca/es/ESprofiles.aspx for more detailed information on the ESRP and the Essential Skills Profiles.

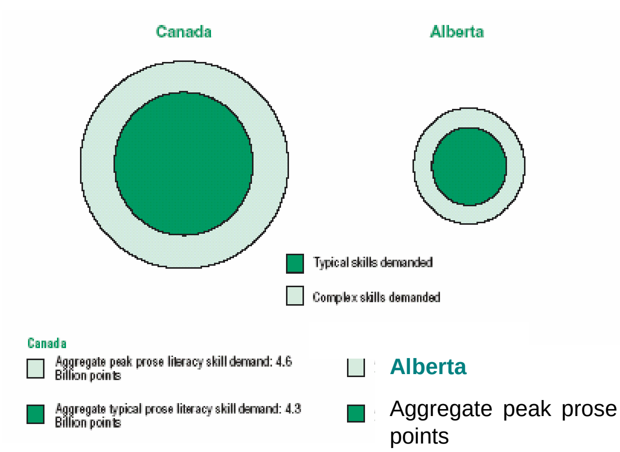
The chapter then draws on data from the Canadian Occupational Projection System (COPS) and from the monthly Labour Force Survey to provide readers with a sense of how the demand for literacy skill by occupation is likely to evolve over the coming decade.

## 2.1 The labour market demand for literacy skill in Alberta

Figure 2.1 presents two estimates of the aggregate level of literacy skill demand for reading text at the Canada and Alberta levels. The first estimate is based upon the usual level of prose literacy skill that the ES profiles indicate is required for satisfactory job performance. The second estimate indicates the demand for prose literacy skill based on the skill level that the ES profile says is needed occasionally. In both cases the aggregate demand is calculated using the score at the lower threshold of the proficiency level. Thus, the two estimates represent the minimum demand for prose literacy skill that prevails in the Canadian labour market.

**Figure 2.1**

**The implied aggregate economic demand for prose literacy skills, adults aged 16 and over, Canada and Alberta, 2006** Error! Bookmark not defined.




**Alberta**

Aggregate peak prose literacy skill demand: 529.2 million points

The figure reveals several important facts, including:

The typical economic demand for prose literacy skill in Canada is relatively high. In total the Canadian economy typically demands an estimated 4.3 billion literacy points, a level that implies an average skill level of 267 points on the 500 point prose literacy scale.

To put the demand in perspective the average skill level of the working age population in Canada in 2006 was estimated to be 273. Thus, Canada has a literacy skill surplus at the aggregate level of roughly 6 points. This difference is equivalent to the additional literacy skill gained through three additional months of education at the mean education level.

Occasionally workers are required to apply a much higher level of skill. The ES profiles suggest that peak demand increases the demand for prose literacy skill by roughly 328 million points to 4.6 billion, an increase of 8%. Peak demand implies a need for an average prose literacy skill of an estimated 287.5 points. Thus peak demand shifts Canada from a literacy skill surplus to a deficit of an average of 13.5 points, an amount equivalent to roughly 6 months of additional schooling.

Peak demand in Alberta increases the implied average skill level to 284 points.

At peak demand levels the Alberta economy generates a demand for 529.2 million points, or 12% of the total peak demand in Canada. Thus, the Alberta economy is responsible for the fourth largest demand for literacy skill in Canada.

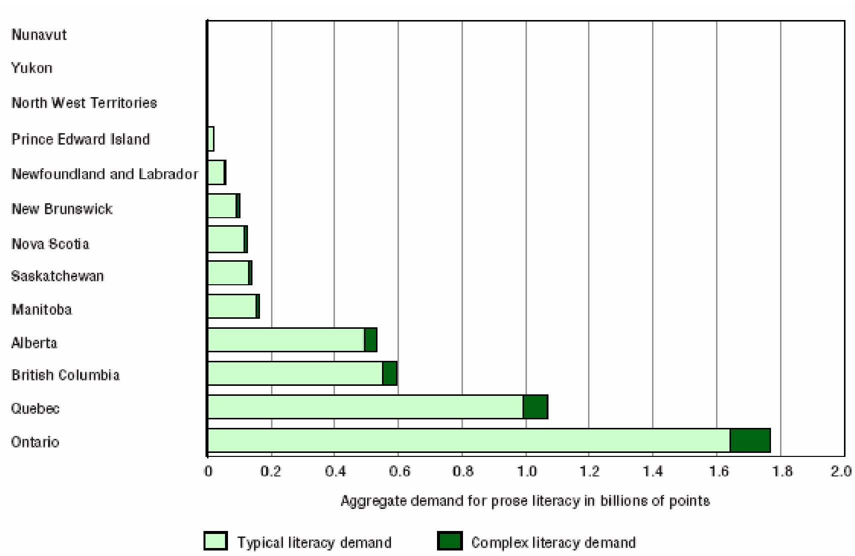
The average level of literacy skill demand per worker in Alberta is also average. Judged on a per employed worker basis, the Alberta economy demands an average literacy of 287 points at peak demand, 1 point below the national average.

It is important to note that these estimates represent the current minimum level of prose literacy skill demand. These estimates are based upon the lower threshold of the literacy levels identified in the Essential Skills Profiles, the minimum needed to satisfy the skill demand constraint. Workers might need skills above these levels, something that would serve to raise the implied demand for skill. The demand for prose literacy skill is expected to grow as firms adopt more knowledge- and information-intense technologies of production and work organizations. According to a recent study, raising the productivity of employees whose jobs can't be automated is the next great performance challenge facing employers (McKinsey, 2004). These workers now largely or wholly spend their time interacting with clients or co-workers. Literacy and numeracy are tools that enable these types of interactions. According to McKinsey companies that get it right will build complex competitive advantages that competitors won't be able to duplicate, if at all. Firms that don't have access to workers with these enabling tools will be forced to compete in other ways, ones that are inherently bad for the overall quality of life in Canada.

Figure 2.2 compares the usual and occasional demand for prose literacy skill among the provinces and territories.

**Figure 2.2**

**The implied aggregate economic demand for prose literacy skill by province and territory, 2006**




Jurisdictions are sorted from smallest to largest

The figure reveals several interesting facts, including:

There are enormous differences in the level of absolute demand for skill from jurisdiction to jurisdiction. Ontario exhibits by far the largest typical demand for prose literacy skill, with a demand of an estimated 1.6 billion points.

Nunavut has smallest level of aggregate literacy demand at 2.6 million points.

Ontario aggregate peak demand for literacy skill is a staggering 580 times larger than demand in Nunavut and is 1.65 times larger than the level of demand in Quebec, the second largest literacy market in Canada.

Alberta generates the fourth highest level of peak aggregate demand.

Jurisdictions differ in their levels of peak prose literacy skill demand. In most provinces peak aggregate demand exceeds the level of typical demand by typical by 8%.

In Nunavut and Yukon peak aggregate demand exceeds the level of typical demand by only 6%.

Alberta peak demand is 7.4% higher than typical demand.

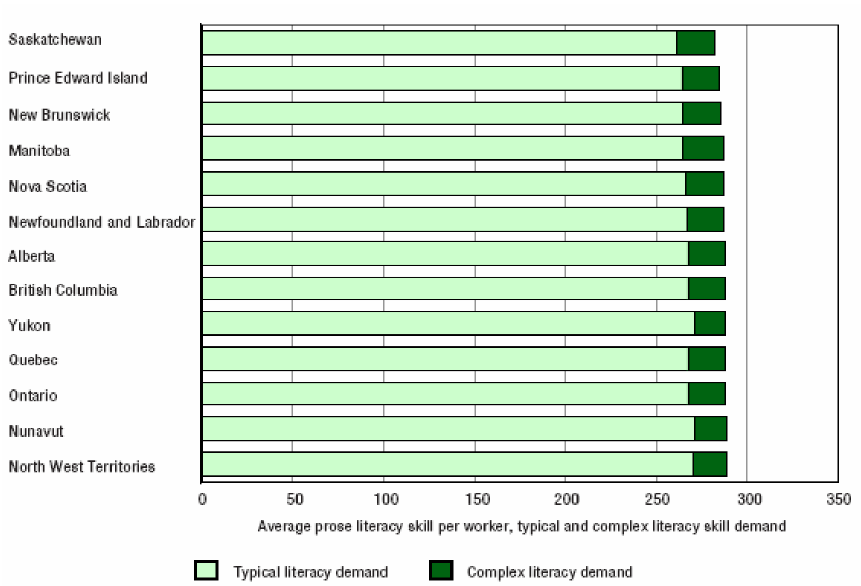
These differences reflect underlying differences in the occupational distribution of employment.

The observed differences in Figure 2.2 reflect both differences in the size of the workforce among jurisdictions and the underlying differences in the industrial and occupational structure of employment.

Figure 2.3 compares the level of demand for prose literacy skill among jurisdictions on a per worker basis. This comparison allows one to compare and contrast the skill intensity of Canada's labour markets.

**Figure 2.3**

**The implied economic demand for prose literacy skill by province and territory, per worker, 2006**



Jurisdictions are ranked by complex level of demand per worker.

The figure reveals several interesting facts, including:

The average level of reading proficiency at typical demand for the current distribution of employment by occupation falls at Level 2 on the 5 level prose literacy scale.

The average level of reading proficiency at peak demand for the current distribution of employment by occupation falls at Level 3 on the 5 level prose literacy scale

No jurisdiction has an average per capita peak literacy skill demand in Level 4, a level that requires workers to deal with conditional information and to draw inference from complex, unfamiliar texts. Given that most jobs in the knowledge economy demand Level 3 or better literacy skill no Canadian jurisdiction can claim to depend on the knowledge economy for a living.

The level of peak literacy skill demand per employed worker in Alberta is just below the national average.

### Levels of proficiency in reading

Proficiency on the IALSS prose literacy scale is estimated on a 500 point scale. This allows average proficiency levels to be computed for different groups of adults. The 500 point prose literacy scale has also been divided into five proficiency levels. The cut points between these levels are theoretically justified in that they represent points at which one observes shifts in the underlying skills needed to perform at a satisfactory level. The levels are also empirically justified in the sense that each level is associated with marked shifts in the impact of skill upon outcomes such as wages and employability. Individuals are placed at a level by having an 80% or better probability of getting tasks of that level of difficulty correct.

Both the demand-side ES profiles and the supply-side IALSS incorporate a scale of reading proficiency that is divided into 5 levels as shown in the table below

**Five levels of difficulty for the prose and document literacy scales**

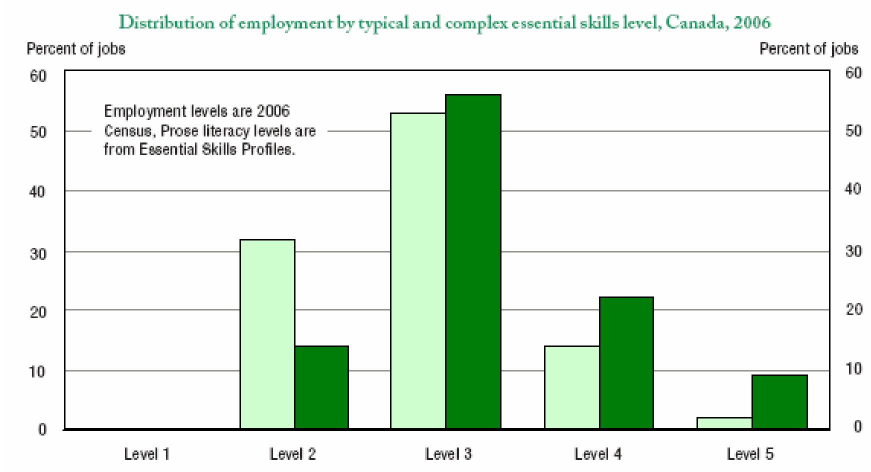
| Levels | Prose | Document |
|---|---|---|
| **Level 1 (0-225 points)** | Most of the tasks in this level require the respondent to read relatively short text to locate a single piece of information that is identical to or synonymous with the information given in the question or directive. If plausible but incorrect information is present in the text, it tends not to be located near the correct information. | Tasks in this level tend to require the respondent either to locate a piece of information based on a literal match or to enter information from personal knowledge onto a document. Little, if any, distracting information is present. |
| **Level 2 (226-275 points)** | Some tasks in this level require respondents to locate a single piece of information in the text; however, several distractors or plausible but incorrect pieces of information may be present, or low-level inferences may be required. Other tasks require the respondent to integrate two or more pieces of information or to compare and contrast easily identifiable information based on a criterion provided in the question or directive. | Tasks in this level are more varied than those in Level 1. Some require the respondents to match a single piece of information; however, several distractors may be present, or the match may require low-level inferences. Tasks in this level may also ask the respondent to cycle through information in a document or to integrate information from various parts of a document. |

| | | |
|---|---|---|
| **Level 3 (276-325 points)** | Tasks in this level tend to require respondents to make literal or synonymous matches between the text and information given in the task, or to make matches that require low-level inferences. Other tasks ask respondents to integrate information from dense or lengthy text that contains no organizational aids such as headings. Respondents may also be asked to generate a response based on information that can be easily identified in the text. Distracting information is present, but is not located near the correct information. | Some tasks in this level require the respondent to integrate multiple pieces of information from one or more documents. Others ask respondents to cycle through rather complex tables or graphs containing information that is irrelevant or inappropriate to the task. |
| **Level 4 (326-375 points)** | These tasks require respondents to perform multiple-feature matches and to integrate or synthesize information from complex or lengthy passages. More complex inferences are needed to perform successfully. Conditional information is frequently present in tasks at this level and must be taken into consideration by the respondent. | Tasks in this level, like those at the previous levels ask respondents to perform multiple-feature matches, cycle through documents, and integrate information; however, they require a greater degree of inference. Many of these tasks require respondents to provide numerous responses but do not designate how many responses are needed. Conditional information is also present in the document tasks at this level and must be taken into account by the respondent. |
| **Level 5 (376-500 points)** | Some tasks in this level require the respondent to search for information in a dense text that contains a number of plausible distractors. Others ask respondents to make high-level inferences or use specialized background knowledge. Some tasks ask respondents to contrast complex information. | Tasks in this level require the respondent to search through complex displays that contain multiple distractors, to make high-level text-based inferences, and to use specialized knowledge. |

Figures 2.4.A and 2.4.B provide two profiles of the national distribution of typical and complex literacy skill demand by proficiency level implied by the distribution of employment by occupation observed in the 2006 Census of population.

**Figure 2.4.A**

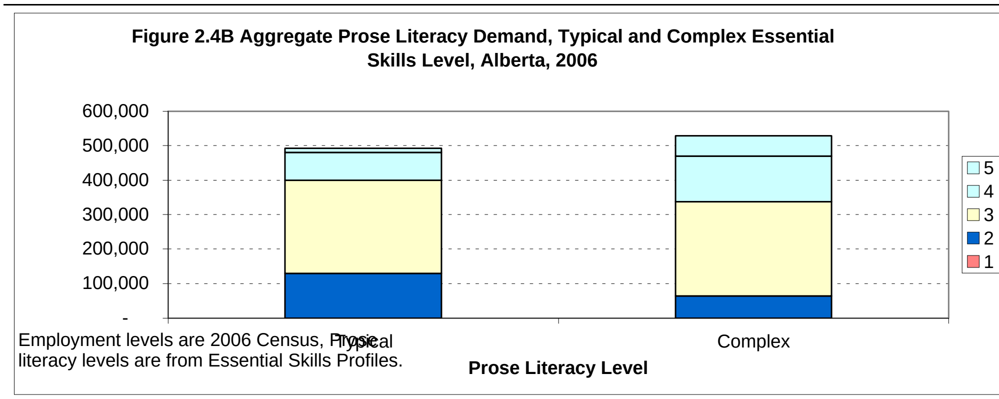
**The distribution of aggregate literacy skill demand by proficiency level, typical and complex, Canada and Alberta, 2006**




**Note:** Employment levels are 2006 Census, Prose literacy levels are from Essential Skills Profiles.
**Source:** HRSDC Essential Skills Profiles 2008, and the 2006 Census of Population.

**Figure 2.4.**

**The distribution of aggregate literacy skill demand by proficiency level, typical and complex, Canada and Alberta, 2006**




**Source:** HRSDC Essential Skills Profiles 2008, and the 2006 Census of Population.

These figures provide additional insight into the demand for literacy skill at the national level, including that:

- jobs that usually require Level 1 face no increase in skill demand under peak demand conditions.
- the aggregate demand for literacy skill at level 2 fall dramatically under peak demand.
- The demand for Levels 3, 4 and 5 rises significantly.
- Proportionally, peak demand increases the most in the most in Level 5 jobs.
- The distribution of typical literacy skill demand at the national level is heavily skewed towards the Levels 2 and 3. 11,091,550 jobs require skill at these two levels, a total that represents approximately 70% of total employment.
- A relatively small proportion of both aggregate typical literacy demand and employment requires Level 1 skills. This represents 39,150 jobs or a vanishingly small proportion of the 15,934,000 jobs in the Canadian economy.
- Very small proportions of total employment require Level 5 skill. There are only 247,450 Level 5 jobs in Canada, a number that represents approximately 2% of total employment.
- Peak skill demand shifts the distribution of employment by proficiency level.
- The proportion of employment in Level 1 drops to zero – no jobs require skill at this level under complex or peak demand.
- The proportion of employment at Level 2 drops by 55% or 2,790,950 jobs.
- The proportions of Level 4 jobs climb by 59%.
- The proportion of jobs requiring Level 5 jobs rises 1,138,300 jobs, an astounding increase of 460%. This number represents 8.7% of total employment.
- The Alberta demand for literacy skill by level under typical and peak demand conditions mirrors the national distribution.
  - 54% of Alberta's peak literacy demand is at Level 3.
  - At peak demand 15% of Alberta's jobs demand Levels 1 and 2 prose literacy skill and 31% require Levels 4 and 5.

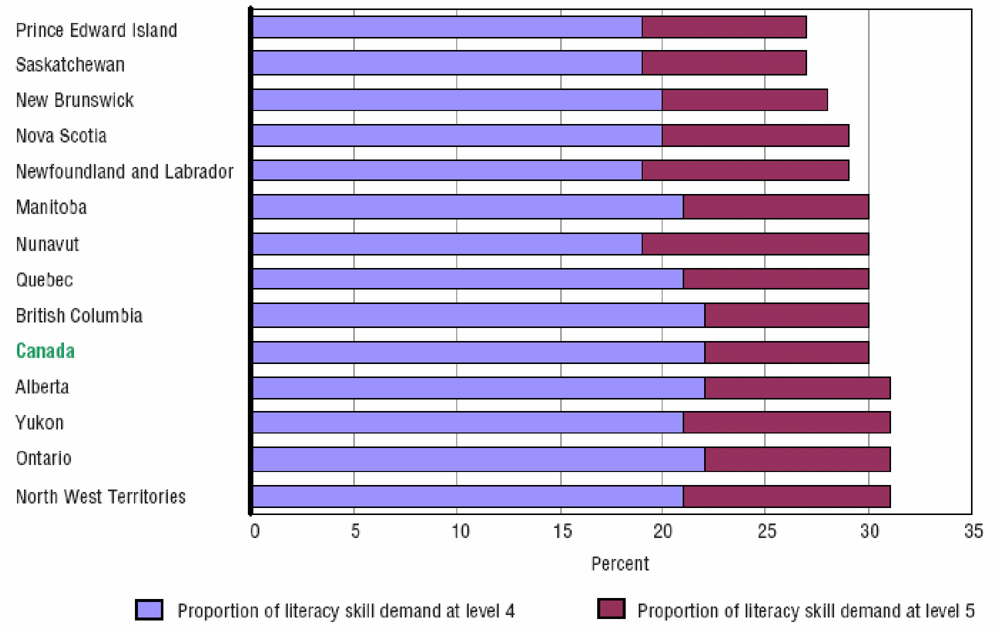
These findings raises interesting questions for policy including the degree to which having such a large proportion of employment below Level 3 might be constraining GDP growth and what might be done to increase the level of skill demand in the economy.

Figures 2.5 and 2.6 explore the differences in the distribution of literacy skill demand among provinces and territories.

Figure 2.5 compares the proportion of total employment that requires high skills by province and territory using the distribution of employment by occupation observed in the 2006 Census of Population. This comparison allows one to reflect on the degree to which different jurisdictions depend upon employment in the knowledge economy as a source of economic output.

**Figure 2.5**

**Proportion of total employment demanding Level 4 or 5 literacy skill, peak demand by jurisdiction, 2006**




Jurisdictions are ranked from highest to lowest proportion.

The figures reveal that:

30% of jobs at the national level require Level 4 and 5 prose literacy skill under peak demand conditions.

The figure reveals the presence of small differences among jurisdictions.

At 31% the Ontario economy demands the highest proportion of jobs with Level 4 and 5 literacy skill.

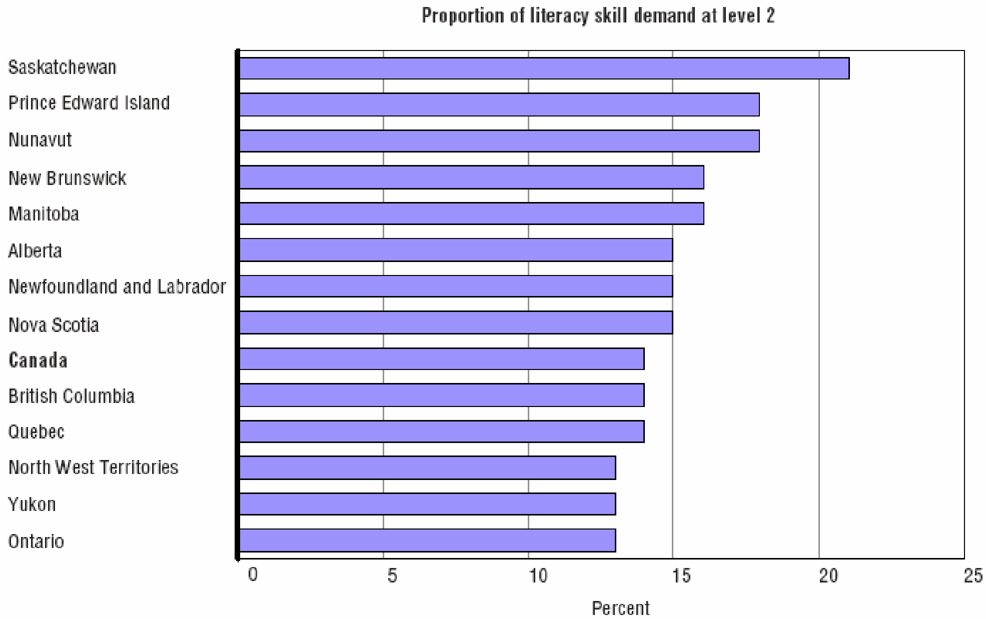
The Yukon and North West Territories also demand the same proportion of jobs with Levels 4 and 5 skills. As noted above this finding can be attributed to the relatively high proportions of public administration, health, education and social service employment in the territories. Somewhat surprizingly, the commodity-dependent Alberta economy demands the same level of Level 4 and 5 jobs.

Prince Edward Island and Saskatchewan have the lowest level of demand for Level 4 and 5 skills (27%).

Figure 2.6 compares the proportion of total employment that demands literacy skill at Levels 1 or 2 among provinces and territories.

**Figure 2.6**

**Proportion of total employment demanding Level 1 or 2 literacy skill, peak demand by jurisdiction, 2006**




**Source:** HRSDC's ES Profiles and the 2006 Census of Population.

The figure reveals a significant level of differences among jurisdictions. Judged by this standard NWT and the Yukon have the lowest proportion of low skilled employment (13%), Saskatchewan (21%) the highest.

The Alberta economy is at the national average, with 85% of employment demanding literacy at Levels 2 and 3 under typical demand.

Figure 2.7 compares the proportion of total employment at the national level by literacy level by occupation for occupation levels. The National Occupational Classification (NOC) defines four skill levels:

Level A occupations generally require a university degree at the bachelor's, master's or doctorate level.

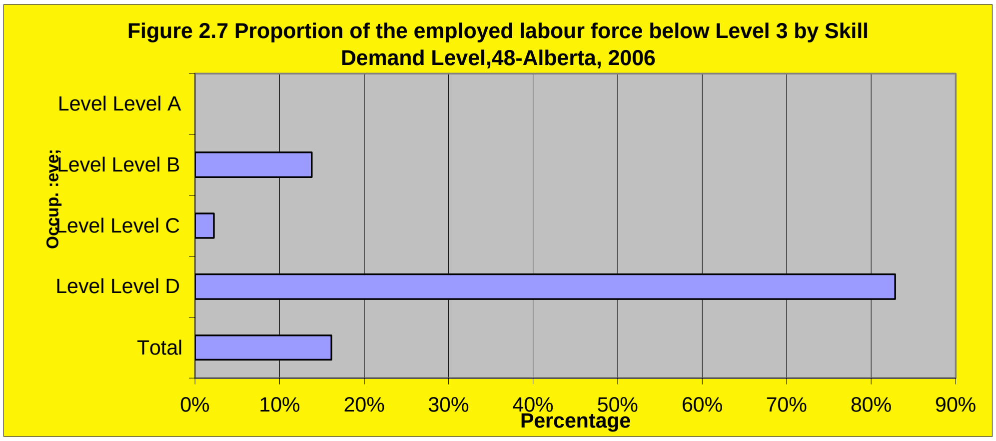
Level B occupations generally require two to three years of post-secondary education at a community college, institute of technology or CEGEP *or* two to five years of apprenticeship training *or* three to four years of secondary school and more than two years of on-the-job training, specialized training courses or specific work experience. Occupations with supervisory responsibilities and occupations with significant health and safety responsibilities, such as firefighters, police officers and registered nursing assistants are all assigned the Skill Level B.

Level C occupations generally require one to four years of secondary school education *or* up to two years of on-the-job training, specialized training courses or specific work experience.

Level D occupations generally require short work demonstration or on-the-job training *or* no formal educational requirements.

**Figure 2.7**

**Proportion of the employed labour force by skill Level below prose literacy Level 3, Alberta, 2006**




**Source:** HRSDC ES Profiles 2008 and the 2006 Census of Population.

Occupation levels are sorted by the proportion of employment at Levels 3 or above.

As expected the data confirm that occupations in those levels that require higher levels of formal education generally require higher levels of literacy.

Notwithstanding this general observation, however, the relationship is far from perfect. One sees a significant proportion of total employment requiring low literacy levels even in occupations that require post-secondary education. Conversely, some occupations that require little or no formal education require high levels of literacy skill.

The figure reveals several facts, including that:

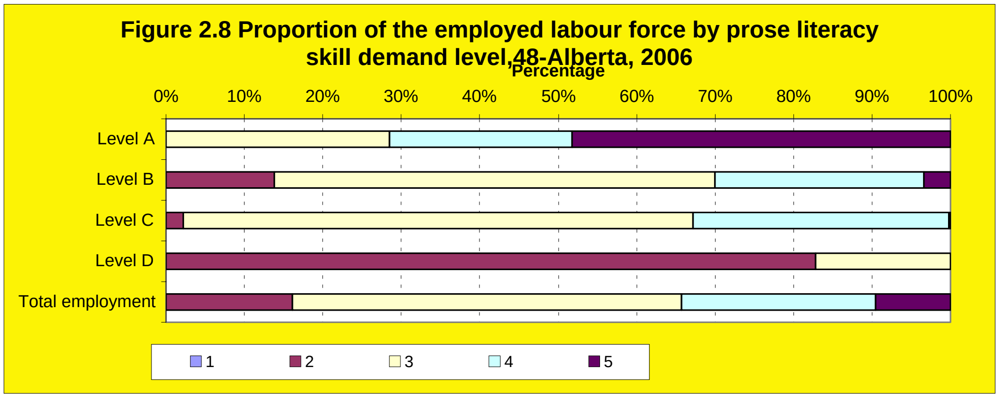
83% of Alberta occupation level D jobs demand literacy skills below prose literacy Level 3

Roughly 83% of occupation Levels B and 98% of Level C jobs in Alberta demand skills at or below prose literacy Level 3.

100% of occupation Level A jobs in Alberta, those that normally require a university degree, demand a skills at Levels 3 or higher.

Figure 2.8 presents the same distribution of prose literacy skill demand by proficiency level for each of the occupation levels.

**Figure 2.8**
**Proportion of the employed labour force by prose literacy skill demand level,Alberta, 2006**

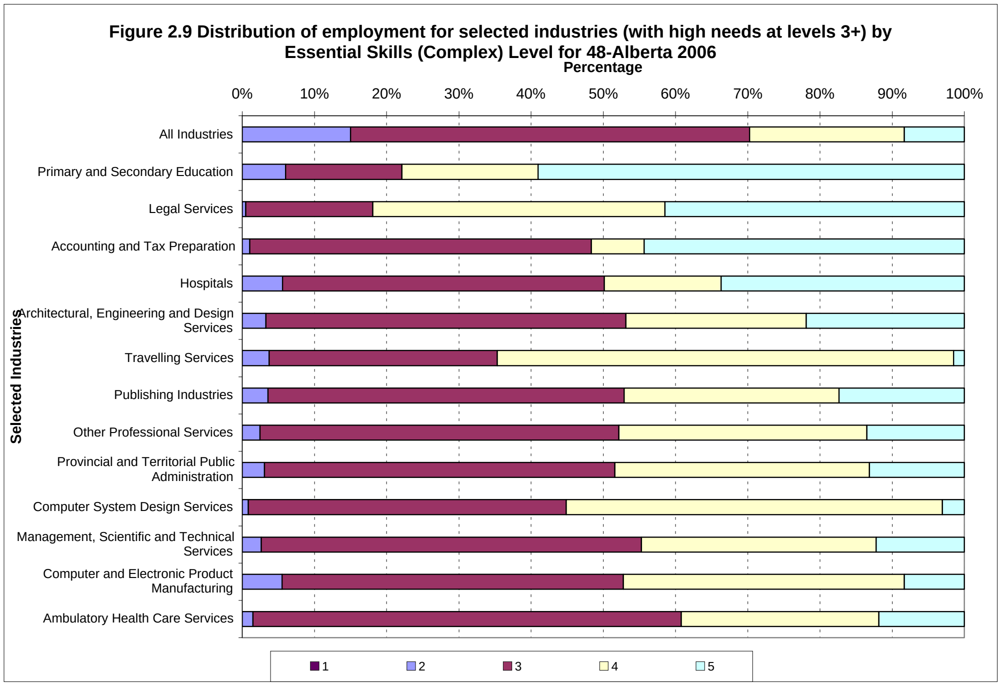



**Source:** HRSDC ES Profiles 2008 and the 2006 Census of Population.

The figures reveal interesting differences in the distribution of literacy skill demand by occupational level. Figure 2.9 presents equivalent results for selected high literacy demand industries for Alberta.

**Figure 2.9**

**Proportion of total employment by literacy skill demand level, selected high demand industries, Alberta, 2006**




**Source:** HRSDC's ES Profiles and the 2006 Census of Population.

Note: Industry groups are sorted by the proportion of total employment at Level 3 and above.

The figure reveals that Alberta's industries differ markedly in their distributions of literacy skill demand.

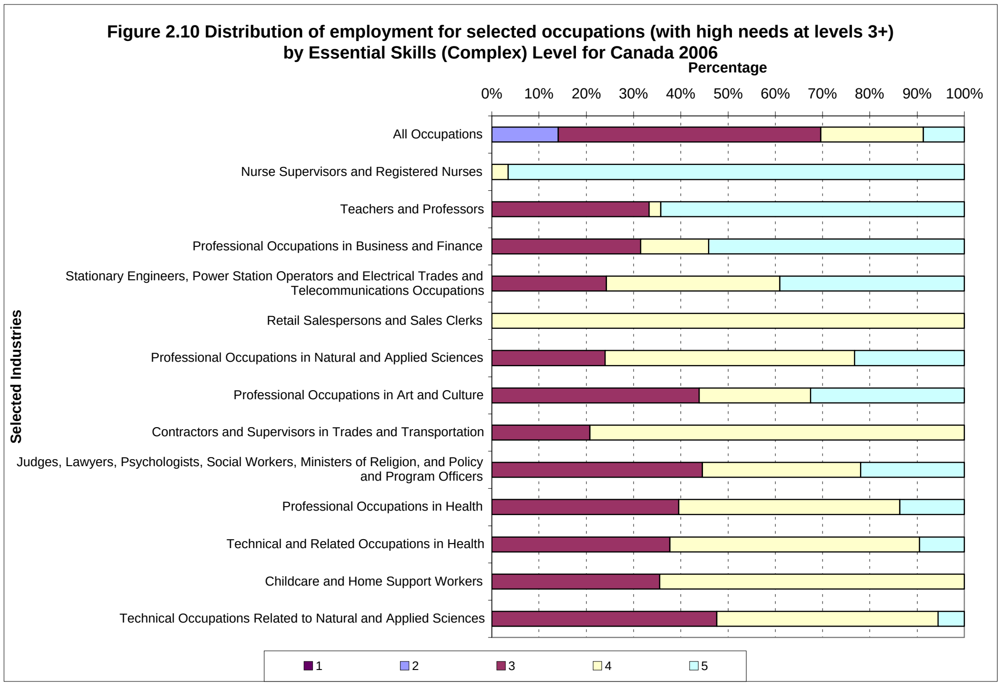
Some industry groups, including those plotted above, demand relatively large proportions of workers with Level 3 or higher skills.

Similarly, some industry groups demand relatively small proportions of workers with Level 3 or higher skills.

Figure 2.10 presents equivalent results for selected high literacy skill demand occupations for Alberta.

**Figure 2.10**

**Proportion of total employment by literacy skill demand level, selected occupations, Alberta, 2006**




**Source:** COPS, 2006 Census of Population and HRSDC ES Profiles.

The figure reveals two findings of interest, including that:

Among occupations nurse supervisors and registered nurses and teachers and professors require the highest level of literacy skill.

Several Alberta occupations demand high proportions of workers with level 4 prose literacy skill, well above the average skill level in the population.

### 2.2 How the demand for literacy skill is likely to change

The forgoing analysis is based upon the distributions of employment by industry and occupation observed in the 2006 Census. The analysis now turns to explore the relationship between the demand for literacy skill and projected growth in employment estimated by the Canadian Occupational Projection System (COPS) for the coming decade.

This information carries important implications for how easily individuals and firms will be able to adjust to the changing structure of Canada's employment.

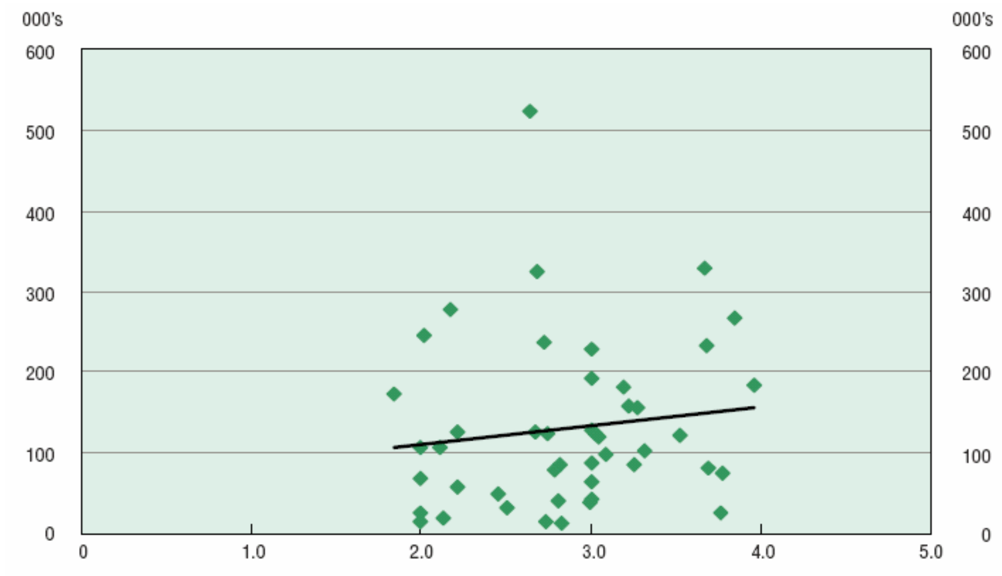
If job gains are concentrated in occupations that demand high levels of literacy skill then employers in the industries that employ those occupations will have difficulty finding workers. Job gains in low skill demand occupations will likely be relatively easy for employers to fill.

Conversely, if job losses are concentrated in occupations that demand low literacy skill levels then employers will have little difficulty in shedding workers. If job losses are concentrated in occupations that demand high literacy levels then workers will be freed up for work in other related occupations.

Figure 2.11 plots projected aggregate job gains (and losses) by occupation against the average level of skill demand in the same occupations using COPS demand projections provided by the Province of Alberta.

**Figure 2.11**

**Projected aggregate job gains by average literacy skill demand, selected occupations, Canada, 2006 - 2016**




**Source:** COPS, 2006 Census of Population and HRSDC ES Profiles.

The figure reveals two findings of interest, including that:

First, that projected employment growth is highly concentrated in occupations that demand high levels of literacy skill. This finding implies that employers will have difficulty in recruiting employees with the required skill levels.

Second, that projected employment losses are highly concentrated in occupations that demand low levels of skill. This implies that the available pool of unemployed workers that will be shed by employers will have relatively low skills, well below the level needed by the newly created jobs.

The 10 occupations that are projected to experience the largest and smallest absolute growth are listed below.

### 10 highest ranked occupations for projected growth in employment, Canada, 2006-2016

| | Projected absolute increase in employment | Level of average skill demand |
|---|---|---|
| Clerical occupations | 523,000 | 2.6 |
| Teachers and professors | 328,000 | 3.7 |
| Paralegals, social services workers and occupations in education and religion, N.E.C. | 324,000 | 2.7 |
| Sales and service occupations N.E.C. | 278,000 | 2.2 |
| Professional occupations in natural and applied sciences | 268,000 | 3.8 |
| Transportation equipment operators and related workers, excluding labourers | 246,000 | 2.0 |
| Managers in retail trade, food and accommodation services | 237,000 | 2.7 |
| Professional occupations in business and finance | 232,000 | 3.7 |
| Other managers N.E.C. | 228,000 | 3.0 |
| Retail salespersons and sales clerks | 192,000 | 3.0 |
| **Total** | **2,856,000** | **2.9** |
| **Total as a percentage of employment** | **17%** | |

### 10 lowest ranked occupations for projected growth in employment, Canada, 2006-2016

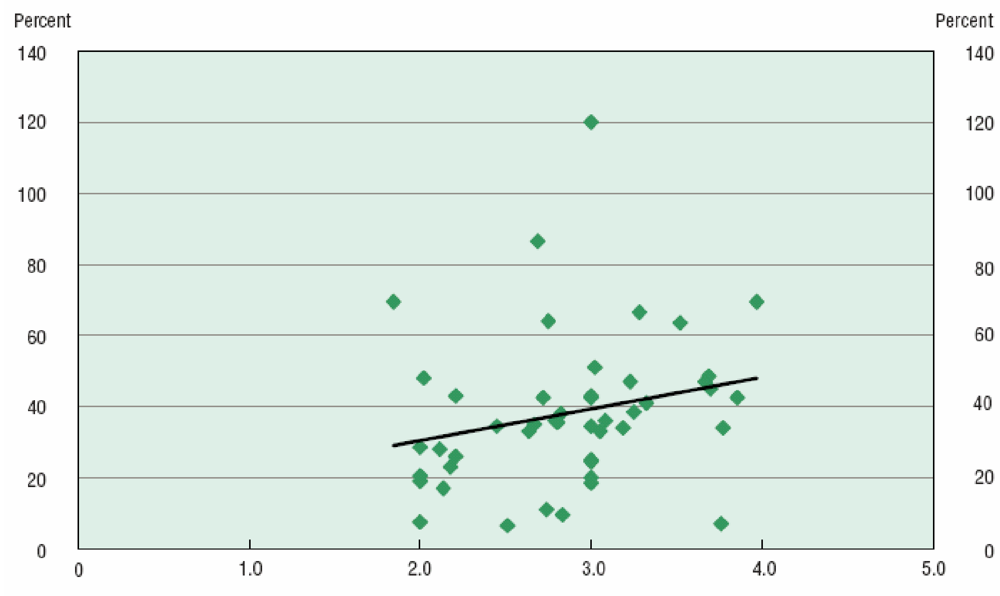
| Occupation | Projected absolute increase in employment | Level of average skill demand |
|---|---|---|
| Other trades N.E.C. | 13,000 | 2.8 |
| Supervisors in manufacturing | 15,000 | 2.7 |
| Labourers in processing, manufacturing and utilities | 15,000 | 2.0 |
| Heavy equipment and crane operators including drillers | 19,000 | 2.1 |
| Primary production labourers | 25,000 | 2.0 |
| Judges, lawyers, psychologists, social workers, ministers of religion, and policy and program officers | 25,000 | 3.8 |
| Machine operators in manufacturing | 31,000 | 2.5 |
| Machinists, metal forming, shaping and erecting occupations | 39,000 | 3.0 |
| Occupations in travel and accommodation including attendants in recreation and sport | 40,000 | 2.8 |
| Secretaries | 42,000 | 3.0 |
| **Total** | **264,000** | **2.7** |
| **Total as a percentage of employment** | **1.58%** | |

The tables reveal that the occupations that are projected to grow the most have an average prose literacy demand level of 2.9 and the occupations that are forecast to grow the least have an average prose literacy skill demand level of 2.7. The 0.2 gap between these two figures suggests that the skill intensity of employment at the national level will rise rapidly between 2006 and 2016.

Figure 2.12 plots projected aggregate job gains (and losses), expressed as a proportion of 2006 employment, by occupation against the average level of skill demand in the same occupations. This display identifies those occupations that face the highest level of relative risk based on expected job gains and losses.

**Figure 2.12**

**Actual aggregate job gains and losses as a proportion of 2006 employment levels by average literacy skill demand, selected occupations, 2006 to 2016, Canada**




The figure reveals some interesting differences from the figure that plotted aggregate changes in employment. These include that:

The slope of the regression line fitted through the percentage growth estimates is steeper than the one fitted through absolute growth. This finding implies that workers in even relatively small occupations will face a significant increase in their required skill level.

The following tables list the 10 occupations that are forecast to growth the most, and the least, in proportional terms.

| Occupation | Projected percentage increase in employment | Level of average skill demand |
|---|---|---|
| Senior management occupations | 120 | 3.0 |
| Paralegals, social services workers and occupations in education and religion, N.E.C. | 87 | 2.7 |
| Occupations in food and beverage service | 70 | 1.8 |
| Nurse supervisors and registered nurses | 69 | 4.0 |
| Technical and related occupations in health | 67 | 3.3 |
| Childcare and home support workers | 64 | 2.7 |
| Professional occupations in health | 64 | 3.5 |
| Finance and insurance administrative occupations | 51 | 3.0 |
| professional occupations in business and finance | 48 | 3.7 |
| Transportation equipment operators and related workers, excluding labourers | 48 | 2.0 |

**10 lowest ranked Industries for percentage projected growth in employment, Canada, 2006-2016**

| Occupation | Projected percentage increase in employment | Level of average skill demand |
|---|---|---|
| Machine operators in manufacturing | 6 | 2.5 |
| Judges, lawyers, psychologists, social workers, ministers of religion, and policy and program officers | 7 | 3.8 |
| Labourers in processing, manufacturing and utilities | 7 | 2.0 |
| Other trades N.E.C. | 10 | 2.8 |
| Supervisors in manufacturing | 11 | 2.7 |
| Heavy equipment and crane operators including drillers | 17 | 2.1 |
| Machinists, metal forming, shaping and erecting occupations | 19 | 3.0 |
| Cashiers | 19 | 2.0 |
| Secretaries | 20 | 3.0 |
| Primary production labourers | 21 | 2.0 |

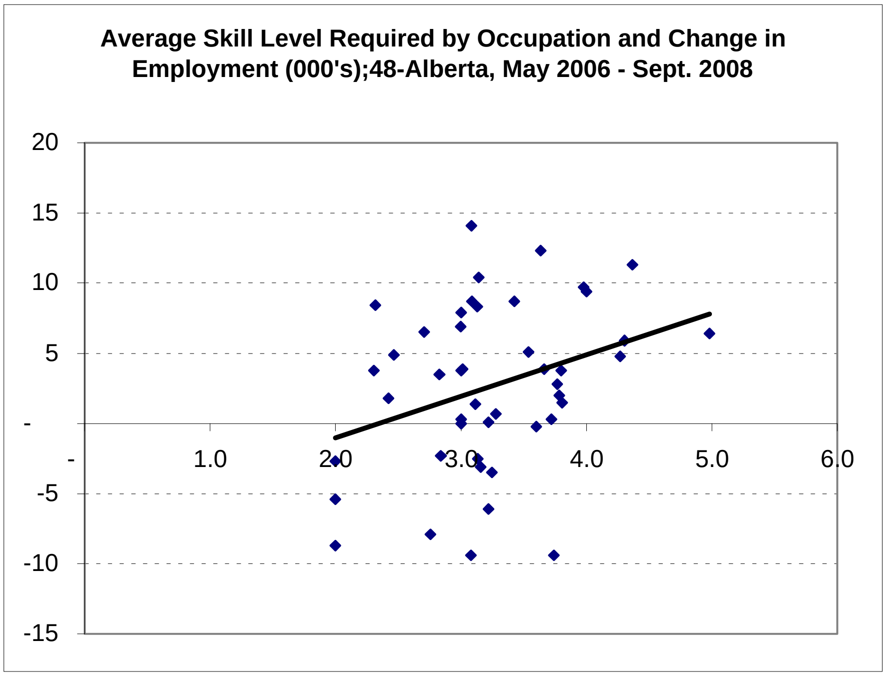
### 2.3 The impact of recent changes in employment on the demand for literacy skill in Alberta

The COPS estimates employed in the forgoing analysis are somewhat dated and are generally available only at the national level. Thus, the projected distributions of employment by occupation derived from COPS can only provide a rough approximation of likely trends.

It is also possible that recent turmoil in Canada's labour markets have altered the demand for literacy skill in significant ways. Figures 2.13 and 2.14 plot the actual changes in employment by occupation observed since May 2006, the reference date of the 2006 Census, using data from the monthly Labour Force Survey (LFS). Recent longitudinal research confirms that low skilled workers are disproportionately affected in periods of high unemployment (Reder, 2009). In periods of strong employment growth all workers seem to experience wage gain. In sharp contrast, in periods of employment loss workers with low levels of literacy skill experience wage loss and are at much higher risk of becoming unemployed.

**Figure 2.13A**

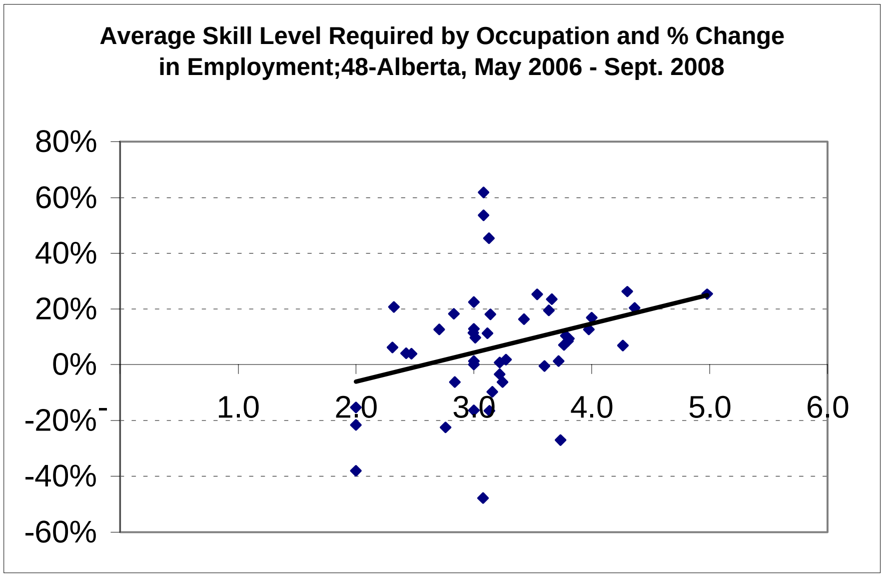
**Actual aggregate job gains and losses by average literacy skill demand, selected occupations, May 2006 to September 2008, Alberta**




**Source:** LFS.

**Figure 2.13B**Error! Bookmark not defined.

**Actual aggregate job gains and losses as a proportion of 2006 employment by average literacy skill demand, selected occupations, May 2006 to September 2008, Alberta**




The figures reveal several important facts, including that:

Changes in Alberta's occupational distribution of employment observed between May, 2006 and September, 2008 appear to be significantly positively skill biased. Expressed in absolute terms job gains have been concentrated in jobs that demand higher average prose literacy skills and job losses have been concentrated in jobs that require lower average literacy skill. This pattern differs from New Brunswick where the skill intensity of employment has been falling sharply.

Expressed as a proportion of 2006 employment job gain also appear to be positively skill biased, that is, that the occupations that are growing at the fastest rates demand higher literacy skills.

The following table identifies the ten occupations that experienced the most rapid rate of growth in the period May, 2006 to September, 2008 in Alberta.

### 10 highest ranked occupations for Alberta percentage growth in employment

| | 10 Highest ranked occupations for 48-Alberta precent growth in employment | Percent increase in employment | Ave Skil Der |
|---|---|---|---|
| 1 | Sales and Service Supervisors | 62% | 3.1 |
| 2 | Heavy Equipment and Crane Operators Including Drillers | 54% | 3.1 |
| 3 | Technical Occupations in Art, Culture, Recreation and Sport | 45% | 3.1 |
| 4 | Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | 26% | 4.3 |
| 5 | Nurse Supervisors and Registered Nurses | 25% | 5.0 |
| 6 | Occupations in Protective Services | 25% | 3.5 |
| 7 | Other Trades N.E.C. | 24% | 3.7 |
| 8 | Clerical Supervisors | 22% | 3.0 |
| 9 | Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers | 21% | 2.3 |
| 10 | Professional Occupations in Business and Finance | 20% | 4.4 |

The following table identifies the ten occupations that experienced the largest growth in the period May, 2006 to September, 2008 in Alberta.

### 10 highest ranked occupations for Alberta growth in employment

| | 10 highest ranked occupations for 48-Alberta absolute growth in Employment | Absolute increase in employment |
|---|---|---|
| 1 | Sales and Service Supervisors | 14,100 |
| 2 | Technical Occupations Related to Natural and Applied Sciences | 12,300 |
| 3 | Professional Occupations in Business and Finance | 11,300 |
| 4 | Construction Trades | 10,400 |
| 5 | Professional Occupations in Natural and Applied Sciences | 9,700 |
| 6 | Retail Salespersons and Sales Clerks | 9,400 |
| 7 | Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | 8,700 |
| 8 | Heavy Equipment and Crane Operators Including Drillers | 8,700 |
| 9 | Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers | 8,400 |
| 10 | Technical Occupations in Art, Culture, Recreation and Sport | 8,300 |
| | **Total projected growth in employment** | 101,301 |
| | **Total as a perent of 2006 employment** | 27.8% |

**Source:** The Labour Force Survey, 2006 Census of Population and HRSDC ES Profiles.

The following tables identify the ten occupations that experienced the lowest growth in the period May, 2006 to September, 2008 in Alberta in proportional and absolute terms.

**10 lowest ranked occupations for Alberta percent growth in employment**

| | 10 lowest ranked occupations for 48-Alberta percent growth in employment | Percent increase in employment | Average Skill Demand |
|---|---|---|---|
| 47 | Secretaries | -48% | 3.1 |
| 46 | Labourers in Processing, Manufacturing and Utilities | -38% | 2.0 |
| 45 | Technical and Related Occupations in Health | -27% | 3.7 |
| 44 | Machine Operators in Manufacturing | -23% | 2.8 |
| 43 | Cashiers | -22% | 2.0 |
| 42 | Supervisors in Manufacturing | -17% | 3.1 |
| 41 | Senior Management Occupations | -16% | 3.0 |
| 40 | Primary Production Labourers | -15% | 2.0 |
| 39 | Machinists, Metal Forming, Shaping and Erecting Occupations | -10% | 3.2 |
| 38 | Mechanics | -6% | 3.2 |

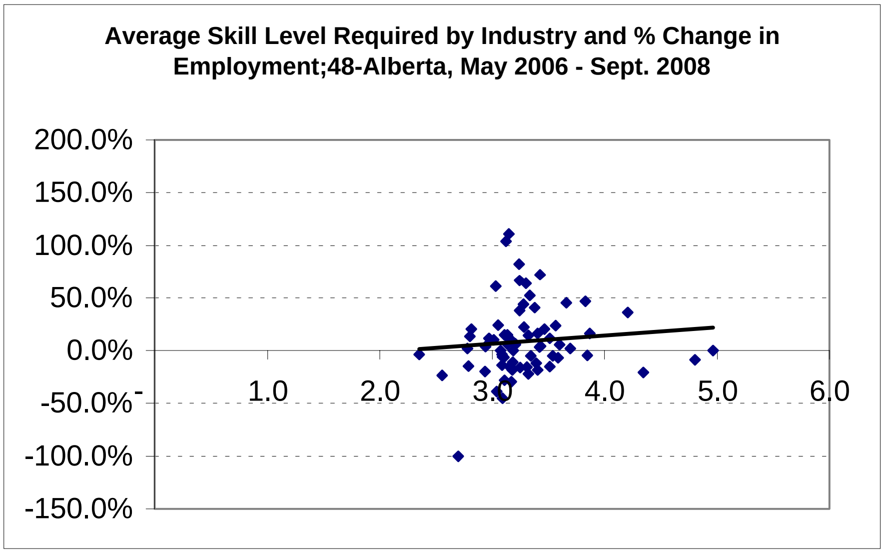
**10 lowest ranked occupations for Alberta absolute growth in employment**

| | 10 lowest ranked occupations for 48-Alberta absolute growth in employment | Absolute increase in employment | Average Skill Demand |
|---|---|---|---|
| 47 | Secretaries | -9,400 | 3.1 |
| 46 | Technical and Related Occupations in Health | -9,400 | 3.7 |
| 45 | Cashiers | -8,700 | 2.0 |
| 44 | Machine Operators in Manufacturing | -7,900 | 2.8 |
| 43 | Clerical Occupations | -6,100 | 3.2 |
| 42 | Labourers in Processing, Manufacturing and Utilities | -5,400 | 2.0 |
| 41 | Mechanics | -3,500 | 3.2 |
| 40 | Machinists, Metal Forming, Shaping and Erecting Occupations | -3,100 | 3.2 |
| 39 | Primary Production Labourers | -2,700 | 2.0 |
| 38 | Supervisors in Manufacturing | -2,500 | 3.1 |
| | **Total projected growth in employment** | -58,700 | 2.9 |
| | **Total as a percent of 2006 employment** | -16.1% | |

The tables reveal that the occupations that have grown the most have an average prose literacy demand level of 3.4 and the occupations that are forecast to grow the least have an average prose literacy skill demand level of 2.9. The 0.5 gap between these two figures suggests that the skill intensity of employment in Alberta has risen between 2006 and 2008.

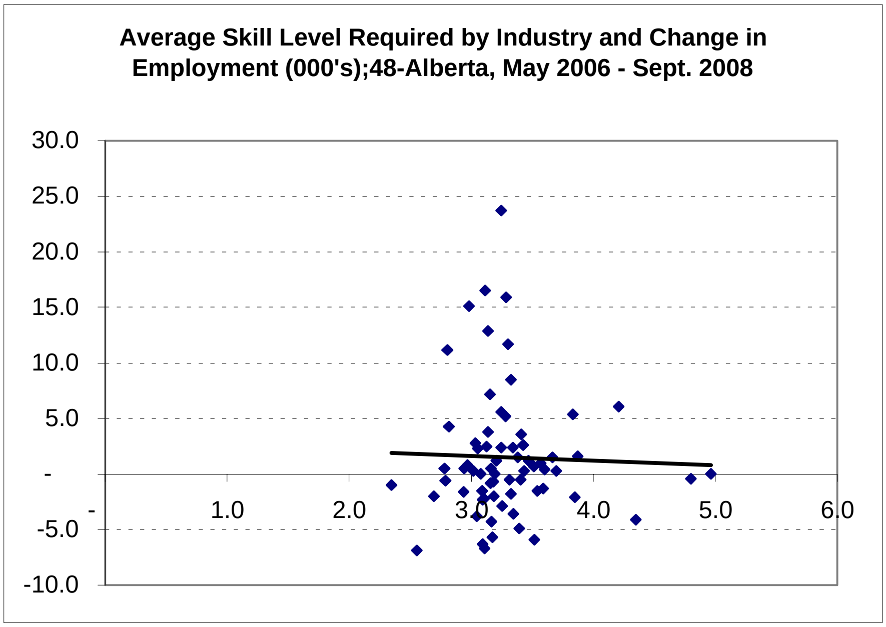
**Figure 2.14**

**Actual aggregate job gains and losses as a proportion of 2006 employment levels by average literacy skill demand, selected industries, May 2006 to September 2008, Alberta**




**Source:** The Labour Force Survey, 2006 Census of Population and HRSDC ES Profiles.

**Figure 2.15Actual aggregate job gains and losses by average literacy skill demand, selected industries, May 2006 to September 2008, Alberta**




**Source:** The Labour Force Survey, 2006 Census of Population and HRSDC ES Profiles.

The figures reveal that:

Changes in Alberta's distribution of employment by industry observed between May, 2006 and September, 2008 reveal a different pattern than those observed by occupation. Specifically, changes in Alberta's industrial distribution of employment observed between May, 2006 and September, 2008 appear to be slightly negatively skill-biased. Expressed in absolute terms job gains have been neither been concentrated in jobs that demand higher average prose literacy skills nor have job losses have been concentrated in jobs that require lower average literacy skill. This pattern differs from New Brunswick where the skill intensity of employment has been falling sharply and from most other jurisdictions where skill intensity by industry has been rising.

Expressed as a proportion of 2006 employment job gain appear to be ever so slightly positively skill biased, that is, that the occupations that are growing at the fastest rates demand higher literacy skills.

Expressed as a proportion of 2006 employment job gains and losses by industry appear to be slightly negatively skill biased, in the sense that both flows are distributed in roughly the same way as 2006 demand, with a slight bias towards creating lower skilled jobs.

The following table identifies the ten industries that experienced the most rapid rate of growth in the period May, 2006 to September, 2008 in Alberta.

## 10 highest ranked Industries for Alberta percentage growth in employment

The following table identifies the ten industries that experienced the most rapid absolute growth

| | | | 10 highest ranked industries for 48-Alberta percentage growth in employment | Percent increase in employment | Averag Sk Demar |
|---|---|---|---|---|---|
| 1 | 4 | 1D: | Support Activities for Agriculture | 159% | |
| 2 | 48 | 5P: | Security Services | 111% | 3 |
| 3 | 65 | 7B: | Heritage Institutions | 104% | 3 |
| 4 | 34 | 5B: | Securities, Commodity Contracts, and Other Intermediation and Related Activities | 82% | 3 |
| 5 | 44 | 5L: | Other Professional Services | 72% | 3 |
| 6 | 21 | 3L: | Primary Metal Manufacturing | 67% | 3 |
| 7 | 42 | 5J: | Management, Scientific and Technical Services | 64% | 3 |
| 8 | 27 | 3R: | Furniture and Related Product Manufacturing | 61% | 3 |
| 9 | 16 | 3G: | Printing and Related Support Activities | 52% | 3 |
| 10 | 37 | 5E: | Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets | 47% | 3 |

in the period May, 2006 to September, 2008 in Alberta.

## 10 highest ranked industries for Alberta growth in employment

| | | | 10 highest ranked industries for 48-Alberta absolute growth in employment | Absolute increase in employment | Average Skill Demand |
|---|---|---|---|---|---|
| 1 | 8 | 2B: | Prime Contracting | 23,700 | 3.2 |
| 2 | 9 | 2C: | Trade Contracting | 16,500 | 3.1 |
| 3 | 29 | 4A: | Wholesale Trade | 15,900 | 3.3 |
| 4 | 7 | 2A: | Mining and Oil and Gas Extraction | 15,100 | 3.0 |
| 5 | 30 | 4B: | Retail Trade | 12,900 | 3.1 |
| 6 | 42 | 5J: | Management, Scientific and Technical Services | 11,700 | 3.3 |
| 7 | 2 | 1B: | Animal Production | 11,400 | - |
| 8 | 68 | 7E: | Food Services and Drinking Places | 11,200 | 2.8 |
| 9 | 40 | 5H: | Architectural, Engineering and Design Services | 8,500 | 3.3 |
| 10 | 48 | 5P: | Security Services | 7,200 | 3.2 |
| | | | **Total projected growth in employment** | 134,101 | 2.9 |
| | | | **Total as a percent of 2006 employment** | 7.1% | |

The following table identifies the ten industries that experienced the least rapid rate of growth in the period May, 2006 to September, 2008 in Alberta.

**10 lowest ranked occupations for Alberta percentage growth in employment**

| 10 lowest ranked industries for 48-Alberta percentage growth in employment | | | | Percent increase in employment | Average Skill Demand |
|---|---|---|---|---|---|
| 75 | 13 | 3D: | Clothing Manufacturing & Leather & Allied Product Manufacturing | -100% | 2.7 |
| 74 | 3 | 1C: | Mix farming | -54% | - |
| 73 | 45 | 5M: | Employment Services | -45% | 3.1 |
| 72 | 46 | 5N: | Business Services | -39% | 3.0 |
| 71 | 71 | 8C: | Religious, Grant-Making, Civic, and Professional and Similar Organizations | -30% | 3.2 |
| 70 | 36 | 5D: | Real Estate | -28% | 3.1 |
| 69 | 67 | 7D: | Accommodation Services | -23% | 2.6 |
| 68 | 52 | 5T: | Publishing Industries | -22% | 3.3 |
| 67 | 38 | 5F: | Legal Services | -21% | 4.3 |
| 66 | 19 | 3J: | Plastics and Rubber Products Manufacturing | -20% | 2.9 |

The following table identifies the ten industries that experienced the last rapid absolute growth in the period May, 2006 to September, 2008 in Alberta.

**10 Lowest ranked occupations for Alberta growth in employment**

| 10 lowest ranked industries for 48-Alberta absolute growth in employment | | | | Absolute increase in employment | Av Sk De |
|---|---|---|---|---|---|
| 75 | 67 | 7D: | Accommodation Services | -6,900 | 2. |
| 74 | 36 | 5D: | Real Estate | -6,700 | 3. |
| 73 | 31 | 4C: | Transportation | -6,300 | 3. |
| 72 | 75 | 9C: | Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | -5,900 | 3. |
| 71 | 71 | 8C: | Religious, Grant-Making, Civic, and Professional and Similar Organizations | -5,700 | 3. |
| 70 | 3 | 1C: | Mix farming | -5,500 | - |
| 69 | 63 | 6H: | Social Assistance | -4,900 | 3. |
| 68 | 58 | 6C: | University Education | -4,300 | 3. |
| 67 | 38 | 5F: | Legal Services | -4,100 | 4. |
| 66 | 46 | 5N: | Business Services | -3,800 | 3. |
| | | | **Total prjevted growth in employment** | -54,099 | 2. |
| | | | **Total as a percet of 2006 employment** | -2.8% | |

The 10 fastest growing industries had an average literacy skill intensity of 2.9 whereas the 10 slowest growing industries also had an average literacy skill intensity of 2.9. Finding no difference suggests that most of the skill intensification is associated with shifts in the occupational distribution of employment in Alberta.

### 2.4 Summary and conclusion

The figures presented above convey several important facts including that:

- the aggregate national demand for literacy skill is relatively high

- the profile of skill demand varies by jurisdiction in four ways:

  - in the aggregate level of literacy skill demand, a fact that reflects underlying differences in the occupational distributions of employment. At peak demand the Alberta labour market generates only 12% of total literacy demand in Canada.

  - in the intensity of skill demand as measured by the demand for literacy skill per worker. The Alberta economy is among the most literacy skill intense.

  - In the proportions of employment that are at Levels 1 and 2, and,

  - In the proportions of employment that are at Levels 4 and 5. Alberta has the highest proportions of Level 4 and 5 jobs among the jurisdictions (tied with Ontario) and among the lowest proportions of Level 1 and 2 jobs of the jurisdictions.

- The demand for literacy skill varies significantly by occupation and industry.

- Projected changes in the distribution of employment by occupation in Alberta are likely to increase demand for skill. Job gains are expected in occupations with high levels of literacy skill demand and job losses are forecast to be concentrated in occupations with low literacy skill demands.

- Recent shifts in employment, observed between May 2006 and September 2008 in the Labour Force Survey, suggest that the COPS projections may not be reliable for Alberta. Employment changes by occupation have been positively “skill-biased” in the sense that job losses appear to have been concentrated in occupations that are characterized as demanding lower levels of prose literacy skills. Conversely job gains have been concentrated in occupations that are characterized as demanding higher levels of prose literacy skills. The increase in the literacy skill intensity of employment appears to be more rapid than in other jurisdictions and and also differs from that observed in New Brunswick jurisdictions where recent changes in the distribution of employment by occupation have served to decrease the literacy skill intensity of employment.

- The pattern of skill intensification by industry is less clear in Alberta, a fact that suggests that much of the change is associated with shifts in the distribution of employment by occupation within industries rather than between them.

## Chapter 3: The supply of literacy skill in Alberta

This chapter provides a detailed profile of the supply of literacy skill in Canada and the jurisdictions by industry and occupation. The profiles use data collected by the 2003 International Adult Literacy and Skills Survey (IALSS). The relationships between background characteristics and literacy skill observed in the IALSS data have been used to derive a literacy level for every adult on the 2006 Census of Population 2B data file.

The chapter also includes a brief summary of the social distribution of literacy skill by province and territory in Canada. This information provides readers with a sense of the share that different groups represent of the total current stock of skill.

It is important to keep in mind that the current stock, or supply, of skill available to the economy is the product of a complex set of social, economic and educational processes operating over the life course. Canada has one of the highest levels of average adult literacy skill among the world's most advanced nations (Statistics Canada and OECD, 2005). The high level of average literacy is, however, somewhat deceiving in that it masks significant variation in skill levels among provinces and territories and between individuals. It is important to reflect upon what might underlie these differences.

Obviously, the initial cycle of formal education generates the most literacy over time as successive cohorts of students leave the secondary system. The quality of early childhood education, and health, also have a marked impact on the supply of skill, as does post-secondary education and participation in various forms of adult learning. The level of literacy skill use on the job, and outside work also seems to influence the available supply of literacy skill. The net result is that some individuals gain literacy skill over the life course, some individuals maintain the level of skill they had when they left initial education and some individuals actually lose literacy skill through a lack of use. The effect of skill loss on the available supply of literacy skill is far from trivial. In fact, enough literacy skill was lost between 1994 and 2003 to offset the entire skill gain associated with higher high school graduation rates, higher levels of participation in post-secondary education and in adult learning, leaving the overall national average skill level unchanged (Willms and Murray, 2005).

Figure 3.1 provides a summary of the stock of adult literacy skill available to the economy in each province and territory.

The figure reveals that the jurisdictions differ enormously in the absolute amount of skill available, with Ontario residents possessing over 100 times more skill than Prince Edward Island. Alberta has only 10.7% of the total aggregate prose literacy supply in Canada. The available evidence indicates that these differences matter economically in that larger, more densely populated areas experience higher rates of economic growth than their smaller, less-densely populated peers (Coulombe and Tremblay, 2005).

**Figure 3.1**

**The aggregate supply of prose literacy skill by jurisdiction, adults aged 16 and over, 2006**

**Comment:** Same as Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

**Source:** 2006 Census of population.

Figure 3.2 displays the distribution of prose literacy skill in the employed labour force by proficiency level for each jurisdiction.

**Figure 3.2**

**Estimates of the distribution of prose literacy skill by proficiency level, employed adults aged 16 and over, the provinces and territories, 2006**

**Comment:** Same as Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

**Source:** 2006 Census of population.

The figure reveals several interesting facts, including that:

The proportion of employed adults that possess Level 1 and 2 literacy skills ranges between 28% and 43%

In no jurisdiction does the proportion of adults with Levels 4 and 5 prose literacy skills exceed 39%.

The literacy levels of Alberta's employed workers compare favourably to other jurisdictions. Fully 763,760 adults, or 41% of employed workers, possess prose literacy skills at Levels 1 and 2, and 633,362 or 34% have Levels 4 or 5.

One of the ways in which employers may respond to any literacy skill shortage is to hire workers with the requisite skills from the experienced labour force i.e. workers that are not currently employed but who have worked in the past five years. Figure 3.3 displays the distribution of prose literacy skill in the experienced labour force by proficiency level for each of the jurisdictions.

**Figure 3.3**

**Estimates of the distribution of prose literacy skill by proficiency level, adults aged 16 and over in the experienced labour force, the provinces and territories, 2006**

**Comment:** Same as Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

The figure reveals much the same patterns of skill distribution as observed for the employed population. The proportion of experienced workers with Levels 1 and 2 literacy skills ranges from 30% to 50%, a fact that implies that these workers would have difficulty meeting the literacy demands of the jobs being created in the Canadian economy.

An estimated 108,209 Alberta adults in the recently employed labour force, or 46%, have prose literacy skills at Levels 1 and 2. This proportion is slightly more than is evident in the employed population in Alberta, a fact that suggests that the experienced labour force that is not currently in employment is slightly less skilled than their employed peers.

One measure of economic efficiency is the rate at which the economy utilizes the supply of experienced labour. Figure 3.4 compares the proportions of the experienced labour force who are employed by jurisdiction.

**Figure 3.4**

**The proportion of the experienced population who are employed, adults aged 16 and over, the provinces and territories, 2006**

**Comment:** Same chart and table as Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

The figure reveals that utilization rates of the occupationally experienced population vary significantly by jurisdiction. At 89% Alberta has the highest utilization ratio, a fact that suggests that Alberta employers can rely less than in many jurisdictions upon drawing experienced workers into the labour market as a means to meet rising demand for literacy skill.

The data reveal a relationship between utilization rates and literacy skill level in Alberta. Specifically, utilization rates rise with skill level from a low of 87% for Level 1 to 91% for workers with Level 5 skills. Thus, occupationally experienced workers with lower skills have a much higher probability of being unemployed but even Level 1 workers with occupational experience have a very high probability of being employed.

Level 3 is a widely accepted benchmark of the skill level needed to compete in the emerging global knowledge economy and to take full advantage of post-secondary education (CCL, 2007). Moreover, these differences have been shown to matter economically. The proportion of low skilled adults has been shown to reduce the rates of GDP and labour productivity growth over the long term (Coulombe and Tremblay, 2006).

Figure 3.5 plots the average prose literacy scores observed in each jurisdiction by the proportion of adults with skills below Level 3.

**Figure 3.5**

**Average prose literacy scores by proportion of adults below prose literacy Level 3, adults aged 16 and over, the provinces and territories, 2006**

**Comment:** Same chart and table as in ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Figure 3.5 confirms that jurisdictions also differ markedly in the distribution of prose literacy skill on these two dimensions.

At 294 the Yukon Territory displays the highest average prose literacy scores followed closely by Alberta (283), Saskatchewan (282) and British Columbia (283). Nunavut displays the lowest average prose literacy score (273). As a group Canada's Atlantic provinces exhibit lower scores than their Western and northern peers.

At 56% Newfoundland has a higher proportion of the adult population with prose literacy skills below level 3 than other jurisdiction, a fact that can largely be explained by the relatively low levels of educational attainment.

At 40% the Yukon Territory exhibits the lowest proportion of adults with prose literacy skills below Level 3. Alberta, Saskatchewan and British Columbia have higher proportions of below level 3 adults than the Yukon but significantly lower proportions than the remaining jurisdictions.

At 45% Alberta displays a below average proportion of adults with Level 1 and 2 skills and an average literacy skill level of 283, or 10 points higher than the national average of 273 and the same average as British Columbia.

Figures 3.6 and 3.7 extends the analysis of the supply of prose literacy in Canada to the industry level. Industries are classified using the 1997 version of the North American Industrial Classification System (NAICS) (see text box)

### The North American Industrial Classification System (NAICS)

The North American Industry Classification System (NAICS) is an industry classification system developed by the statistical agencies of Canada, Mexico and the United States. Created against the background of the North American Free Trade Agreement, it is designed to provide common definitions of the industrial structure of the three countries and a common statistical framework to facilitate the analysis of the three economies. NAICS is based on supply-side or production-oriented principles, to ensure that industrial data, classified to NAICS, are suitable for the analysis of production-related issues such as industrial performance.

NAICS is a comprehensive system encompassing all economic activities. It has a hierarchical structure. At the highest level, it divides the economy into 20 sectors. At lower levels, it further distinguishes the different economic activities in which businesses are engaged.

The associated table provides an estimate of the total stock of skill that is available by industry computed by multiplying the total number of adults that were employed at some point in the Census reference year by prose literacy score. This is referred to as the utilized stock of skill.

Figure 3.6 shows that the industries that employ the largest stocks of literacy skill.

**Figure 3.6**

**The aggregate supply of literacy skill, selected industries, Alberta, 2006**

**Comment:** Use Chapter 3 – indust – march 17.xls for new Alberta table and chart

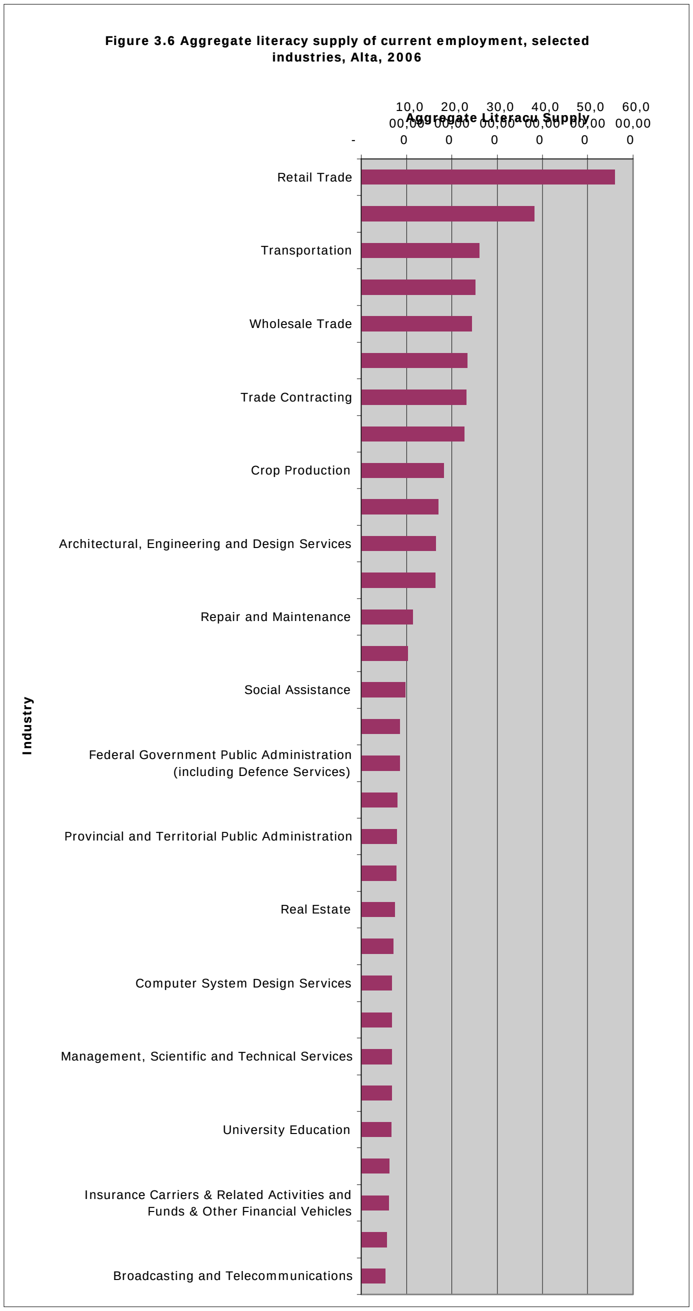


Figure 3.6 Aggregate literacy supply of current employment, selected industries, Alta, 2006
Aggregate Literacy Supply
-
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000
Industry
Retail Trade
Transportation
Wholesale Trade
Trade Contracting
Crop Production
Architectural, Engineering and Design Services
Repair and Maintenance
Social Assistance
Federal Government Public Administration (including Defence Services)
Provincial and Territorial Public Administration
Real Estate
Computer System Design Services
Management, Scientific and Technical Services
University Education
Insurance Carriers & Related Activities and Funds & Other Financial Vehicles
Broadcasting and Telecommunications

**Source:** Census of Population, 2006 and IALSS, 2003.

10 industries that can draw on the largest supply of literacy in Alberta include:

employment aggregate literacy supply

| Industry by the Aggregate Supply of Prose Literacy Skills | | Employment | Aggregate supply |
|---|---|---|---|
| 4B: | Retail Trade | 194,400 | 55,987,200 |
| 2A: | Mining and Oil and Gas Extraction | 127,550 | 38,265,000 |
| 4C: | Transportation | 91,550 | 26,091,750 |
| 7E: | Food Services and Drinking Places | 90,100 | 25,228,000 |
| 4A: | Wholesale Trade | 83,200 | 24,460,800 |
| 2C: | Prime Contracting | 80,500 | 23,345,000 |
| 2D: | Trade Contracting | 80,700 | 23,241,600 |
| 6A: | Primary and Secondary Education | 72,400 | 22,733,600 |
| 1A: | Crop Production | 68,550 | 18,234,300 |
| 6F: | Hospitals | 56,500 | 17,063,000 |

Figure 3.7 presents those industries that have the highest proportions of current employment below prose literacy Levels 1 and 2.

**Figure 3.7**

**The proportion of current employment with skills below prose literacy Level 3, selected industries, Alberta, 2006**

Comment: same

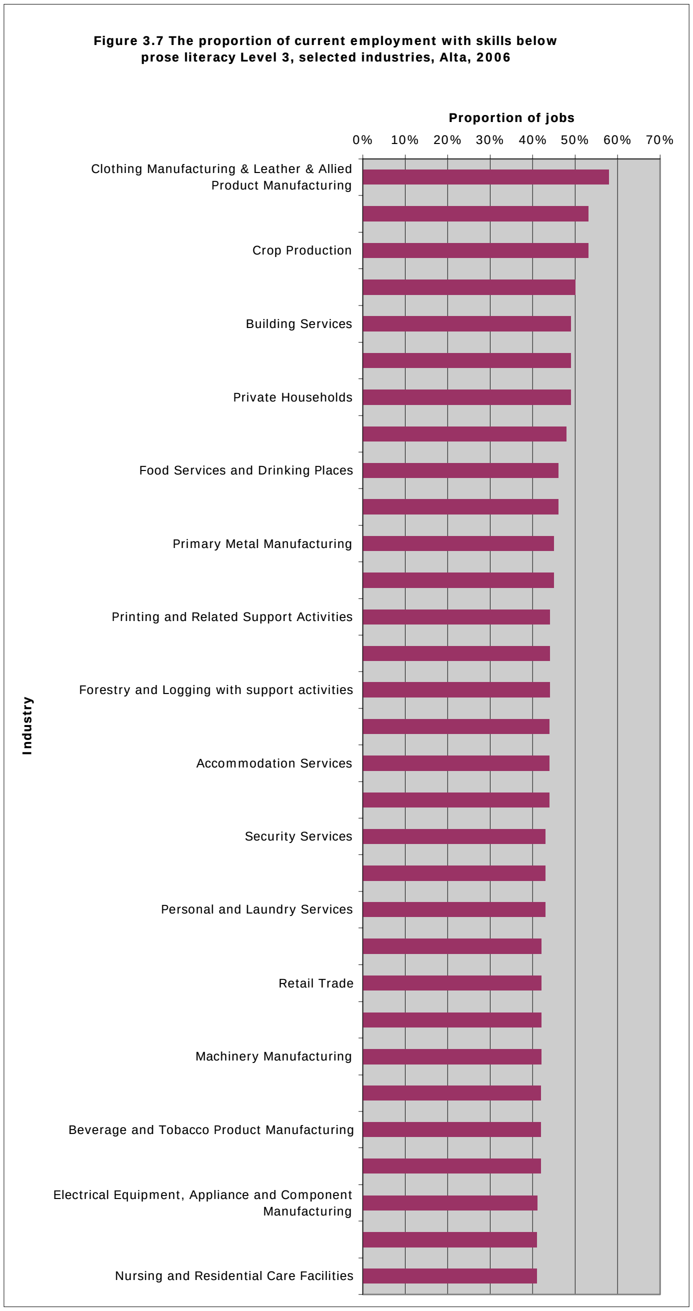


Figure 3.7 The proportion of current employment with skills below prose literacy Level 3, selected industries, Alta, 2006
Proportion of jobs
0%
10%
20%
30%
40%
50%
60%
70%
Industry
Clothing Manufacturing & Leather & Allied Product Manufacturing
Crop Production
Building Services
Private Households
Food Services and Drinking Places
Primary Metal Manufacturing
Printing and Related Support Activities
Forestry and Logging with support activities
Accommodation Services
Security Services
Personal and Laundry Services
Retail Trade
Machinery Manufacturing
Beverage and Tobacco Product Manufacturing
Electrical Equipment, Appliance and Component Manufacturing
Nursing and Residential Care Facilities

The figure reveals several facts, including that:

Four industries operate with 50% or more of workers with skills below Level 3:

| | |
|---|---|
| Clothing Manufacturing & Leather & Allied Product Manufacturing | 58% |
| Crop Production | 53% |
| Food Manufacturing | 53% |
| Furniture and Related Product Manufacturing | 50% |

Collectively the three figures provide a portrait of the literacy skill distribution by industry. Among other things, the figures confirm that:

Industries vary considerably in the stock of skill being employed.

Industries differ greatly in the proportions of low and high skilled workers they employ.

The analysis now shifts to a parallel exploration of the distribution of the stock of prose literacy skill by occupation. Occupations are classified using Statistics Canada's version of the 1990 National Occupational Classification (NOC), the 1990 Standard Occupational Classification (SOC) (see text box).

### Canada's National Occupational Classification

The *National Occupational Classification* (NOC) is a system for describing the occupations of Canadians. It gives statisticians, labour market analysts, career counsellors, employers and individual job seekers a standardized way of describing and understanding the nature of work.. The NOC was implemented in 1992 as a replacement for the *Canadian Classification and Dictionary of Occupations* (CCDO). The NOC has been updated for Census 2006 in collaboration with Statistics Canada.

In a nutshell, the NOC is a tool that is used to classify occupations according to their Skill Level and Skill Type. A four-digit code, called the "NOC code", identifies the occupation. Each digit of this code reflects an important trait of the occupation it represents.

#### Skill Type

Skill Type is based on the type of work performed, but it also reflects the field of training or experience that is normally required for entry into the occupation. This includes the educational area of study required, as well as the industry of employment in cases where experience within an internal job ladder is required for entry. These categories are intended to indicate easily understood segments of the world of work.

The 10 Skill Types that represent the first digit of a NOC code.

#### NOC skill types

| Skill Type | Occupation |
|---|---|
| 0 | Management occupations |
| 1 | Business, finance and administration occupations |
| 2 | Natural and applied sciences and related occupations |
| 3 | Health occupations |
| 4 | Occupations in social science, education, government service and religion |
| 5 | Occupations in art, culture, recreation and sport |

6 Sales and service occupations
7 Trades, transport and equipment operators and related occupations
8 Occupations unique to primary industry
9 Occupations unique to processing, manufacturing and utilities

### Skill level

In the context of the NOC, Skill Level corresponds to the type and/or amount of training or education typically required to work in an occupation. The NOC consists of four Skill Levels identified A through D and each is assigned a numerical value ranging from 1 to 6. To illustrate this concept, have a look at the following chart to see the relationship between the alphabetical value of each Skill Level and its accompanying numerical value.

Skill Level is primarily based on the nature of education and training required to work in an occupation. This criterion also reflects the experience required for entry and the complexity of the responsibilities involved in the work, compared with other occupations. In most cases, progression to Skill Level A, from B, is not usually possible without completion of additional formal education, whereas progression from Skill Level D to Skill Level C is often achievable through on-the-job training and experience.

The 4 Skill Levels (both alphabetic characters and numerical values) used in the NOC.

### NOC skill levels

| Skill level (alpha) | Skill level (digit) | Nature of education / training |
|---|---|---|
| **A.** Occupations usually require university education. | 1 | University degree at the bachelor's, master's or doctorate level. |
| **B.** Occupations usually require college or vocational education or apprenticeship training. | 2 or 3 | Two to three years of post-secondary education at a community college, institute of technology or CEGEP.<br>*or*<br>Two to five years of apprenticeship training.<br>*or*<br>Three to four years of secondary school and more than two years of on-the-job training, specialized training courses or specific work experience.<br>Occupations with supervisory responsibilities and occupations with significant health and safety responsibilities, such as firefighters, police officers and registered nursing assistants are all assigned the Skill Level B. |
| **C.** Occupations usually require secondary school and / or occupation-specific training. | 4 or 5 | One to four years of secondary school education.<br>*or*<br>Up to two years of on-the-job training, specialized training courses or specific work experience. |

| | | |
|---|---|---|
| **D.** On-the-job training is usually provided for occupations. | 6 | Short work demonstration or on-the-job training.<br>*or*<br>No formal educational requirements. |

Each Skill Level is intended to reflect commonly accepted paths to employment in an occupation. Where there are several paths to employment, the Skill Level most commonly identified by employers is used, considering the context of the occupation and the trends in hiring requirements.

A *major group* is simply the first two digits of an NOC code. It is a roll-up, or, an aggregation of minor groups. There are 26 major groups in the NOC

At the three-digit level, the major groups are further divided into 140 *minor groups*.

At the four-digit level, the system is expanded into 520 occupational groups identified as *unit groups*. Unit groups represent further specificity within an occupational domain.

Figures 3.8 through 3.9 provide estimates of the total stock of skill that is available to each occupation computed by multiplying the total number of adults that were employed as of the Census reference period in May 2006 by prose literacy score. This is referred to as the current stock of prose literacy skill.

Figure 3.8 shows that the Alberta occupations that employ the largest stock of skill.

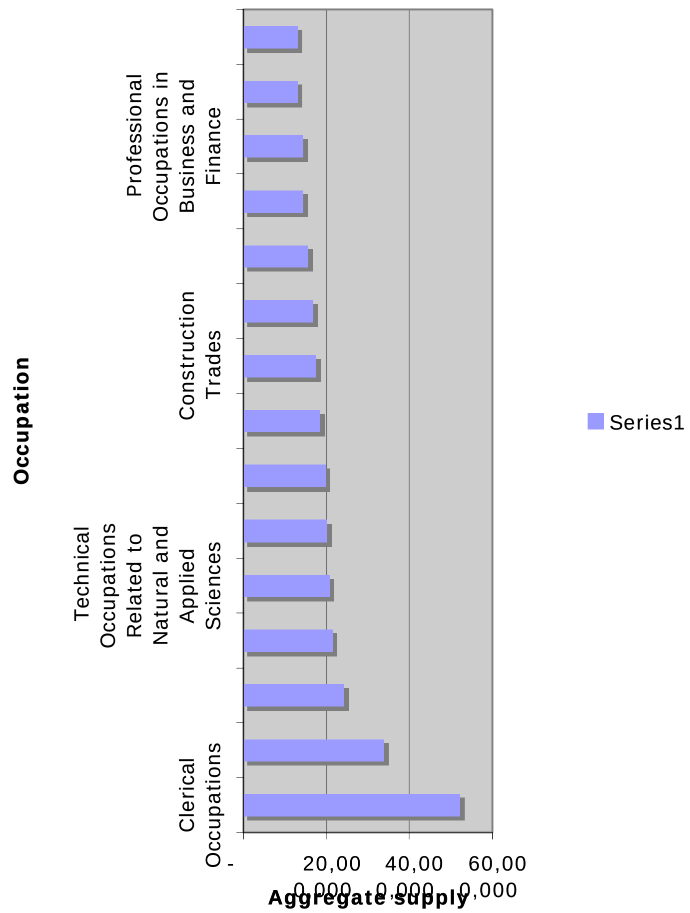
Figure 3.9 presents the occupations that have the highest proportions of current employment below prose literacy Level 3.

**Figure 3.8**

**The supply of literacy skill, selected occupations, Alberta, 2006**

**Comment:** needs updating to NS chapter 3 - occup – april 21.xls

**Figure 3.8 The supply of literacy skill, selected occupations, Alberta, 2006**

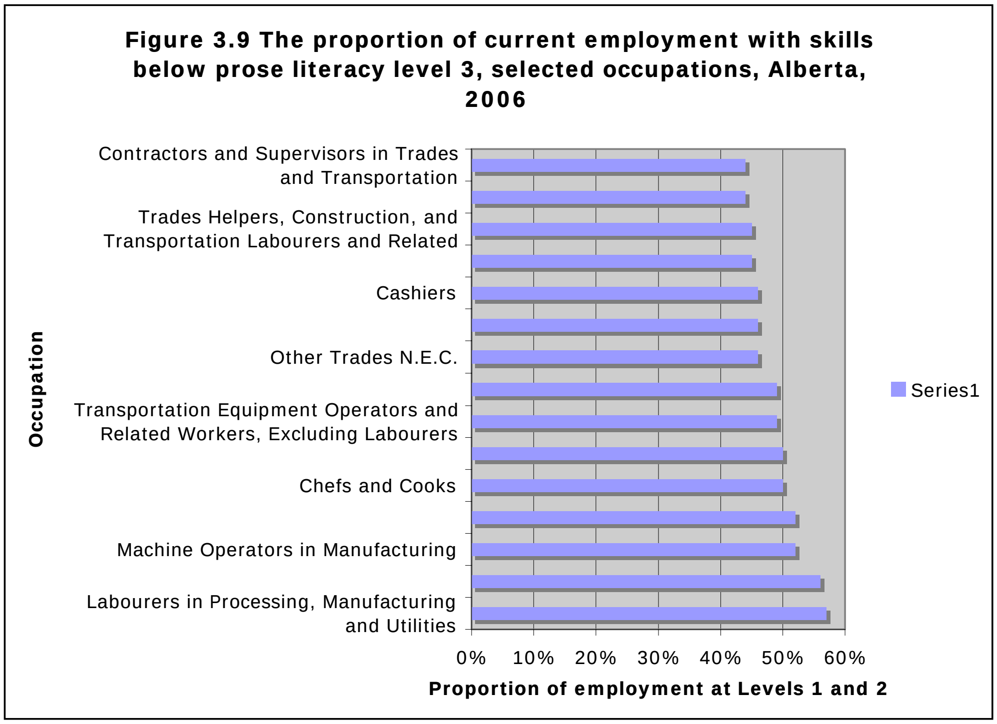



**Source:** IALSS, 2003 and Census of Population, 2006.

**Figure 3.9**

**The proportion of current employment with skills below prose literacy level 3, selected occupations, Alberta, 2006**

**Comment:** same – needs update




The figure identifies those occupations that have the highest proportions of current employment with skills below prose literacy level 3.

Figure 3.10 displays the industries in Alberta that have above average proportions of Levels 3, 4 and 5 prose literacy skill at peak demand.

**Figure 3.10**

**The proportion of employment with skills above prose literacy level 3, selected industries, Alberta, 2006**

Comment: same

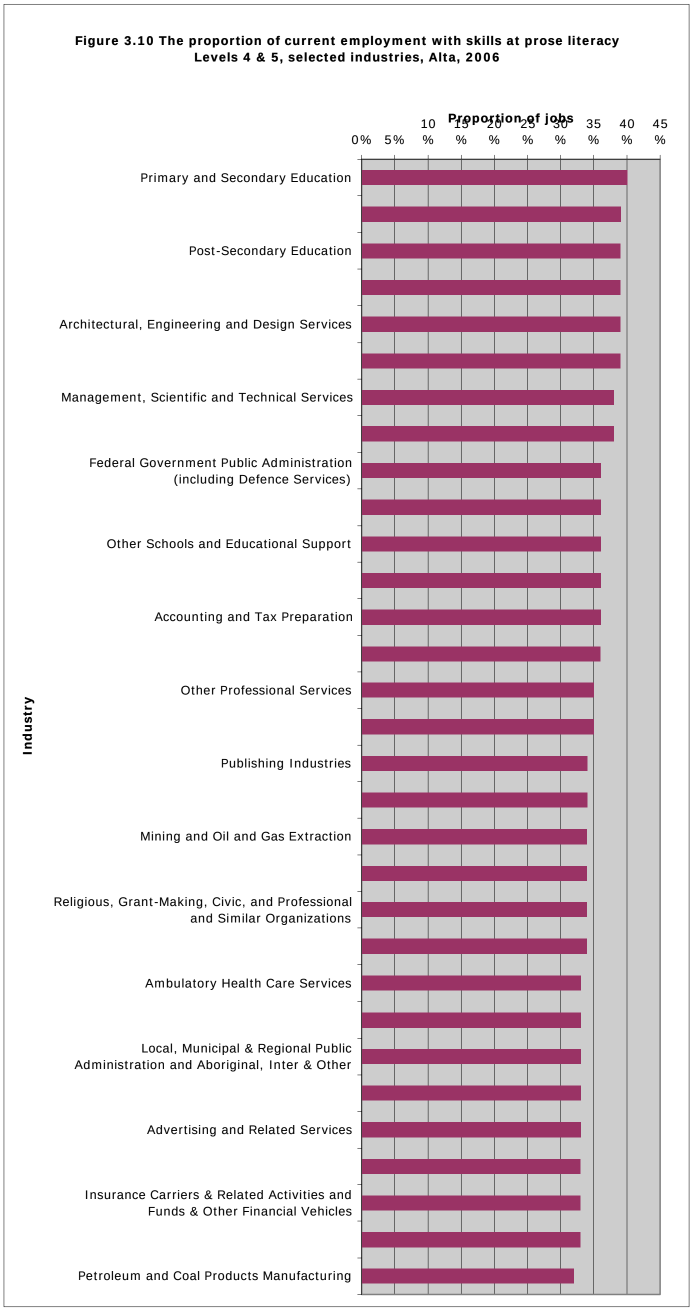


Figure 3.10 The proportion of current employment with skills at prose literacy Levels 4 & 5, selected industries, Alta, 2006
Proportion of jobs
0%
5%
10 %
15 %
20 %
25 %
30 %
35 %
40 %
45 %
Industry
Primary and Secondary Education
Post-Secondary Education
Architectural, Engineering and Design Services
Management, Scientific and Technical Services
Federal Government Public Administration (including Defence Services)
Other Schools and Educational Support
Accounting and Tax Preparation
Other Professional Services
Publishing Industries
Mining and Oil and Gas Extraction
Religious, Grant-Making, Civic, and Professional and Similar Organizations
Ambulatory Health Care Services
Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other
Advertising and Related Services
Insurance Carriers & Related Activities and Funds & Other Financial Vehicles
Petroleum and Coal Products Manufacturing

**Figure 3.11**

**The proportion of current employment with skills above prose literacy level 3, selected occupations, Alberta, 2006**

Comment: same

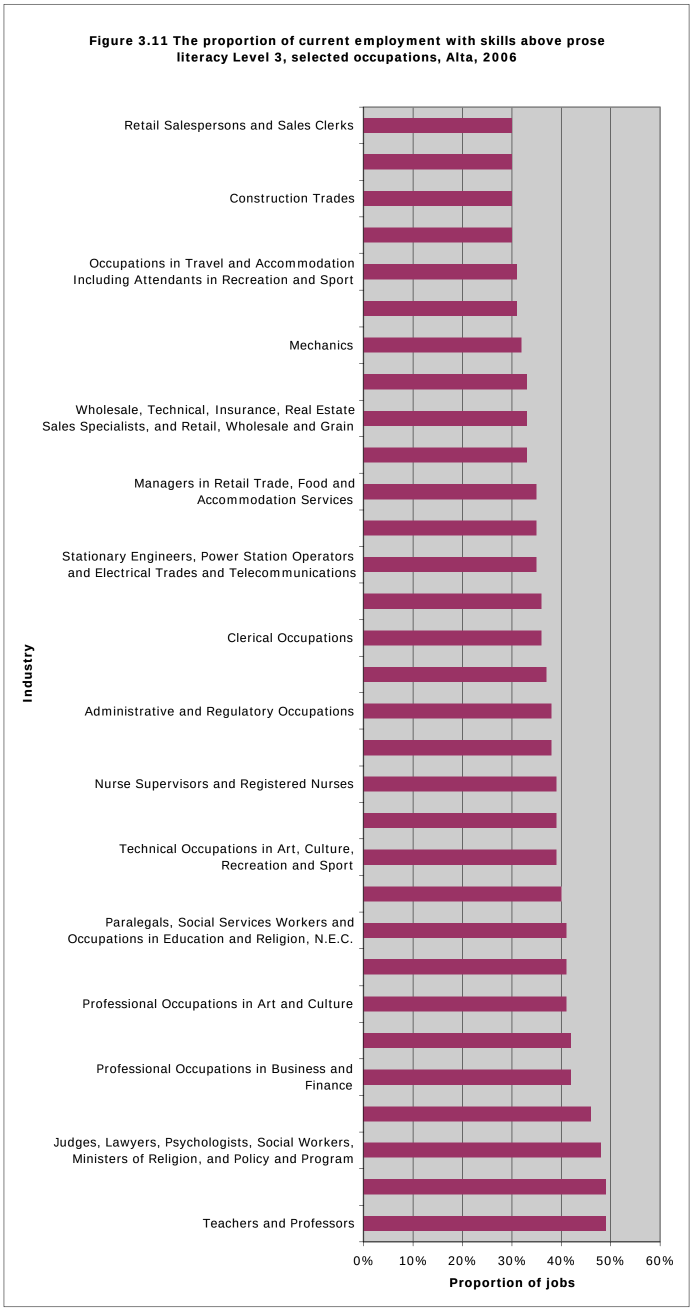


Figure 3.11 The proportion of current employment with skills above prose literacy Level 3, selected occupations, Alta, 2006
Retail Salespersons and Sales Clerks
Construction Trades
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport
Mechanics
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain
Managers in Retail Trade, Food and Accommodation Services
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications
Clerical Occupations
Administrative and Regulatory Occupations
Nurse Supervisors and Registered Nurses
Technical Occupations in Art, Culture, Recreation and Sport
Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.
Professional Occupations in Art and Culture
Professional Occupations in Business and Finance
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program
Teachers and Professors
Industry
0%
10%
20%
30%
40%
50%
60%
Proportion of jobs

Collectively the three figures provide a portrait of the literacy skill distribution by occupation. Among other things, the figures confirm that:

Occupations vary considerably in the stock of skill being employed.

Occupations differ greatly in the proportions of low and high skilled workers they employ.

### 3.1 How the supply of prose literacy skill is projected to grow to 2016

Since the Second World War the Canadian economy has relied largely upon a combination of immigration and increases in the quantity and quality of skill flowing out of the secondary and post-secondary education systems to meet steadily rising demand for literacy skill. During the same period Canada was relatively less dependent on participation in various forms of adult learning to generate higher levels of literacy skill than many of our trading partners. This strategy made sense given the relatively large size of the cohorts leaving the education system. It would seem that current public and corporate policy assumes that these policies will continue to deliver the skills required to meet rising demand. The following section of the report tests this assumption empirically using a set of literacy projections of literacy skill by level for the period 2001 through 2031.

The case for investing in adult literacy, the size of the investment that would be required to achieve the desired reductions in adults judged to be at risk, and the urgency with which investment is required, all depend critically upon assumptions about how the size of literacy skill shortages are likely to evolve over the medium term.

Current estimates suggest that fully 48% of the adult Canadian population aged 16 and over lack the literacy skill to compete fully and fairly in the emerging global economy.

Many public policy makers have assumed that the proportion of adults judged to be at risk will fall steadily over the coming decades in response to increases in the average quantity and quality of education over the life course. On the face of it this would seem to be a reasonable assumption. Average years of schooling have been rising steadily over the past decade. Rates of participation in post-secondary education and adult education and training have been rising as well. There are also indications that improvements in the quality of education have precipitated a steady increase in average literacy levels of students leaving the secondary system. These are all trends that are expected to continue over the coming decades.

The approach employed in the research combines the relationships between literacy level and individual characteristics observed in Statistics Canada’s 2003 Adult Literacy and Life Skills Survey (ALL) with a set of detailed population projections produced by Statistics Canada that provide the empirical base that underpins most government planning.

The tangible result is a set of estimates of the number of adults at each of the five literacy levels identified in the IALSS assessment. Separate estimates have been derived for Alberta, and for key geographies within the province and for population sub-groups, annually for the period 2003 through 2031. These data allow for an analysis of how the distribution of literacy is likely to evolve and what the projected changes imply for policy.

The most striking result flowing from the analysis calls into question the assumption that the proportion of adults with literacy skills below Level 3 will fall over the coming decades. Provided that the relationships observed in the IALSS study are reasonably stable over the projection period, and literacy remains something that is economically and socially relevant, then literacy should assume a position high on the list of public policy priorities.

Canada earns its living through trade, a fact that implies that we will be among the first to feel any shifts in the terms of trade in the global economy. Prudence alone suggests a need to understand the economic and social forces that are transforming the global economy and to reflect upon whether the Canadian economy is prepared to meet the challenges implied therein.

Understanding the evolution of skill profiles is a matter of understanding the flows of skill that are expected to transform the available stock of skill over time.

The rest is simple arithmetic – multiply the number of people in each of the expected flows by their relative skill level, and then adding the resultant values up year over year, provides an estimate of the stock of literacy skill for future periods.

An analogy is useful here. Think of a bathtub partly full of water at a given temperature. The volume of water and its temperature represents the stock of literacy skills available in the current period for use by the labour market and the broader society.

Now think of the tap being on. The flow of water into the tub serves to raise the water level, just as the flow of young people leaving the secondary and post-secondary system increases the available stock of literacy skill available to the labour market. Obviously the rate at which the tub will fill up depends upon the how open the tap is on. At a trickle it will take a long time to fill, wide open it will fill rapidly. The same principle applies to how quickly the water in the tub will heat up or cool off. No matter what the rate incoming water that is cooler than that which is in the tub will tend to cool the entire tubful. Similarly, water that is warmer than that which is in the tub will tend to increase the average temperature. In both cases the rate at which the temperature increases or decreases will be defined by the product of the flow rate and the difference between the current temperature of the water in the tub and the incoming flow from the tap.

Changes in the stock of literacy skill are driven by the same basic principles. The number of students leaving the education system multiplied by how much their average skill level is above or below the average skill level of all adults will provide an estimate of how quickly the stock of literacy skills is likely to grow over time as successive cohorts of students enter the labour market.

Now think about the tub being so full that water is draining out through the overflow. Again the rate at which the tub drains, and the average temperature of the water leaving the tub, will determine the remaining volume of water and whether it becomes cooler or hotter over time. The dynamics of skill stocks are essentially the same. Older workers leave the labour force through retirement and eventually the mortal coil through death, events that change the stock of skill over time. The rate at which they will change the overall stock of literacy skill will depend upon how many of them there are and what their average skill level is relative to the overall average.

At this point the metaphor begins to break down. Most bathtubs only have one tap and one drain. In contrast, the stock of literacy skill is changed by multiple flows, each with its own “volume” and “average temperature”. The principles, however, remain the same – the rate of change in the stock of skills will depend on both the size of the flows and their average skill levels.

For example, the stock of literacy skill has grown over time due to large numbers of baby-boomers leaving high school with higher skills than previous cohorts. Current cohorts of students are much smaller due to unprecedented declines in fertility, a fact that limits the impact that they can have on the overall stock of skill.

Similarly, the stock of literacy skill is added to by varying amounts through participation in various sorts of post-secondary education. Rates of participation are rising rapidly but the relatively small size of the cohorts will limit their contribution to the stock of skill.

Participation in adult education and training will add to the stock of literacy skill.

Rates of participation in adult education and training have been rising steadily over the past decades so it might be expected that they will contribute to increasing the stock of skill.

Immigration will change the stock of skill over time as additional cohorts of immigrants arrive but will only add to the stock of skill if their average skills are better at arrival than the average skill level or if they improve their literacy skills faster than previous cohorts.

Generally retirement and death will serve to improve the average skill level of the population because, as a group they have much lower levels of education, and literacy skill, than the average.

Similarly, out-migration is likely to reduce the stock of skill over time as high skilled adults seek economic opportunity in other countries and retirees seek warmer climes.

Finally, to the surprise of some, skill loss in adulthood appears to have had a marked impact on the available stock of literacy skills in the current period. A large percentage of all adults lost skills they once had between 1994 and 2003, a loss that appears to be the result of inadequate levels of aggregate economic and social demand for skill use. Although each adult lost only a small proportion of their skill the large number of adults touched implies a significant negative flow.

The following figure attempts to capture the key features of the system that will define the quality of the literacy skill stock over the coming decades.

**Figure 3.12**

**Stock and flow: Understanding what will change Canada's literacy skill profile over the coming decades**

**Comment:** same graphic as Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

The following figures are included to provide readers with some sense of the relative quality of the skill flows that will precipitate change in the stock of Canada's stock of skill.

### The skill quality of Canada's 15 year olds

The following chart, based upon data from the 2000 cycle of the OECD Programme for International Student Assessment (PISA), reveals that Canada's 15 year olds have among the highest average levels of reading literacy in the developed world, something that augurs well for their ability to compete in the global economy. It is worth noting, however, that the size of current youth cohorts is relatively small by recent standards so their short-term impact on the overall supply of literacy skill will be small.

Alberta's 15 year olds compare favourably to other countries and to other Canadian jurisdictions, displaying average scores that are the highest in the world.

**Figure 3.13**

**Average reading literacy scores of in-school youth aged 15 in 2000, for selected countries and provinces**

**Comment:** same chart and table as the Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

**Source: PISA 2000**

### Skill gain through adult education and training

Figure 3.14 displays the annual rates of participation in adult education and training by the intensity of training, measured in average hours, for provinces.

Canada does not compare favourably by this standard – participation rates are below those attained by other countries and the intensity of training is lower than than observed for many of Canada's trading partners. It is reasonable to assume, therefore, that the flow of skill being added to the supply from this source will be modest.

Alberta compares reasonably well to other jurisdictions in this respect with average hours of training per participant and the participation rate in formal adult education and training during the course of a year above the national average.

**Figure 3.14**

**Annual participation rates in adult education and training by the intensity of training measured in average hours, for adults aged 15 to 65, by province, 2003**

**Comment:** same table and chart as the Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

source

**Source: Adult Education and Training Survey, 2003**

## Skill loss

Comparison of data from the 1994 International Adult Literacy Survey (IALS) and the 2003 Adult Literacy and Life Skills Survey (ALL) confirmed the startling fact that a significant number of adult Canadians lost an appreciable amount of their literacy over the intervening 9 years, enough to eliminate the positive impact of higher levels of educational attainment on the average literacy score. This is a troublesome finding in two respects. To begin with, the skill that was lost cost taxpayers a considerable amount of money to confer in the first place. Second, the loss of skill implies a loss of earnings potential to the individuals involved and a reduction in overall economic performance. The existence of skill loss suggests that current levels of economic and social demand for skill are insufficient.

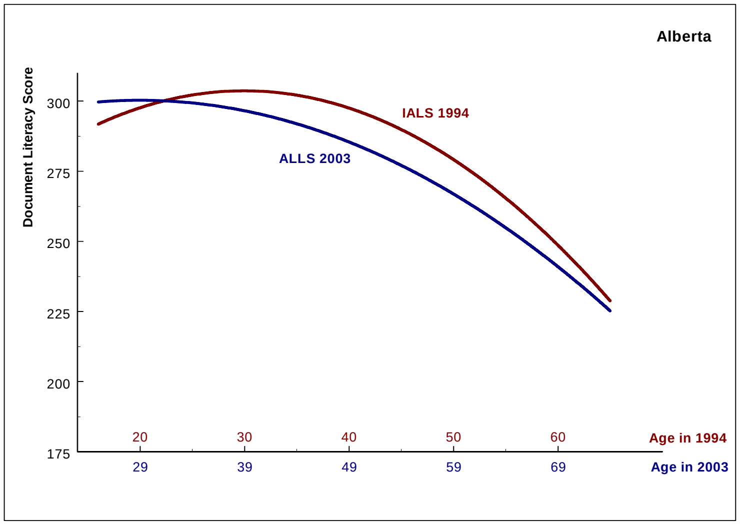
Figure 3.15 compares average skill levels of adults over the age range for the two periods. The figure suggests that at the national level adults who were 25 or older in 1994 lost an average of 15 points between 1994 and 2003. Over time losses of this magnitude will serve to reduce the available supply of skill. The chart for Alberta reveals a similar pattern - skill loss is observed over most of the age range during the decade 1994 - 2003. These findings suggests that the demand for literacy skill of Alberta workers is below the level needed to maintain current stocks, a finding that mirrors the low levels of skill use in some Alberta industries.

**Figure 3.15**

**Net document literacy skill loss of adults by age, 1994 to 2003, Canada and Alberta**

**Comment:** Canada panel stays the same but NS panel needs to replace Ontario one – see New Brunswick skill loss.doc

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.




The foregoing figures suggest that Canada's supply of skill is unlikely to grow rapidly over the coming decades. International migration may help meet rising skill demand but dependence on these flows brings it s own problems and costs.

In order to get a better handle on the likely supply of skill that will be available to the Canadian economy a set of skill projections were derived as outlined below.

### Projecting Canada's literacy profiles: the methods

This chapter provides a set of projections that represent what we believe to be the most likely distribution of adult literacy by proficiency level for Canada, Alberta and a number of sub-provincial geographies. The objective of this chapter is to set out the methods that were used to derive these projections and what the methods imply for their use.

### CCL's projections of prose literacy skill by proficiency level

> The estimates of future literacy supply presented below were produced by DataAngel Policy Research Incorporated on behalf of the Canadian Council on Learning (CCL).
>
> The tangible result of this work is a set of estimates of the number of adults aged 16 and over at each of the literacy levels identified in the IALSS assessment. Separate estimates were derived for the province, for key geographies within the province and for population sub-groups, annually for the period 2003 through 2031. These data allow for an analysis of how the distribution of literacy is likely to evolve and what the projected changes imply for policy.
>
> The most striking result flowing from the analysis is that the assumption that the proportion of adults with literacy skills below Level 3 will remain unchanged over the coming decades. Provided that the relationships observed in the ALL study are reasonably stable over the projection period, Canada's employers will face a critical literacy skill shortage at a time when such skill will be critical to achieving the high rates of productivity growth needed to keep employment levels high and Canadian firms competitive in global markets.

Conceptually the methods used to generate the projections summarized in this volume are simple and easy to understand.

Essentially the analyses involved two steps as described below.

As a first step, data from the 2003 Adult Literacy and Life Skills Survey (ALL) was analyzed to uncover the relationships between objectively assessed literacy skill and a limited set of individual characteristics including age, gender, education, immigrant status and aboriginal status. The analysis produces a separate set of probabilities for each cell in a matrix defined by a combination of age group, gender, education, immigrant status for provinces and territories and for Census Metropolitan Areas (CMA's) and the non-CMA residual within provinces. More specifically the analysis estimates the probability of an individual being at Prose Literacy Level 1, 2, 3, 4 or 5 given their characteristics.

The actual probabilities are estimated with a logistic regression.

As a second step, the probabilities for each cell in the matrix from the first step are multiplied by an identical matrix of population projections produced by demographers at Statistics Canada.This multiplication is repeated for each year for which the Statistics Canada projections are available, specifically 2001 to 2031.

The result is an annual estimate of the population at each of the 5 ALL prose literacy proficiency levels for the period 2001 to 2031.

These estimates provide a means to explore likely shifts in the distribution of literacy skill at the national level, by jurisdiction, for a limited range of sub-provincial geographies and for key population sub-groups including:

- Youth
- Seniors
- Immigrants
- Adults with relatively low levels of education
- Women

Although it would be useful for policy purposes it is not possible to project the skill levels of aboriginal adults because the underlying demographic projections have yet to be produced.

### Understanding the strengths and weaknesses of the projections

As with any statistical data the literacy projections produced for this volume have are characterized by a set of statistical properties that define their fitness for use of for various purposes.

Users are encouraged to factor the following two considerations into their use of the projections and the inferences that they draw thereupon.

First, they should note that the regression analysis that was used to derive the probabilities of being at a given proficiency level were restricted to those variables that are also available from Statistics Canada in the form of their demographic projections. Analysis has shown that these variables explain roughly 85% percent of the variability in adult literacy skill – high by social science standards – but still a level that leaves roughly 15% of the variance unaccounted for in the models.

Second, while the sample sizes used to estimate the probabilities are relatively large, the resulting regression parameters are themselves subject to error. Larger sample sizes, or different samples of adults, might yield slightly different estimates.

Third, the reliability of the literacy projections depends upon the reliability of demographic projections to which they have been applied. As a matter of course Statistics Canada produces several variants of these projections, each of which introduces a slightly different set of assumptions as a means of testing the sensitivity of the projections to the underlying assumptions about the relationships among variables. The current set of projections are based upon a set of assumptions that most closely reflect historical relationships. To the extent that these do not apply in the future, then the estimates will be less useful.

Fourth, it is possible that the projections, restricted as they are to estimating proportions of the adult population at each proficiency level, may not capture improvements in average skills occurring within levels. These gains may be large enough to be socially and economically important without being large enough to push people over the threshold into the next level.

Finally, the usefulness of the projections depends crucially upon the strong assumption that the current relationships observed among variables will hold in the future. There is reason to believe that these relationships change very slowly over time. Nevertheless, shifts in policy can have a marked impact on the observed relationships so caution in using the projections is warranted.

This is important enough to warrant illustration with an example.

Analysis of the data from the ALL study has revealed two important facts.

First, the current cohort of immigrants appear to possess literacy skill levels that are roughly equal to those demonstrated by their immigrant peers who arrived 6 or more years ago (Statistics Canada and OECD, 2005; Statistics Canada and HRSDC, 2006).Given that immigrants have been shown to take roughly 11 years to acquire enough literacy to reach parity with equally qualified non-immigrants, these data imply that the most recent cohort of immigrants will eventually outperform their Canadian born peers. The regression models employed in the current analyses will capture some but not all of this effect, a fact that will effect the reliability of the projected distributions for this subgroup. The size of the effect will depend upon the degree to which future cohorts of immigrants resemble previous cohorts, something that is clearly under the control of policy makers. It is unlikely, however, that the reliability of the projected overall distributions of literacy would be much effected, in large measure because the flow of immigrants skill is relatively small in comparison to some of the other flows.

Second, analysis of the ALL data has revealed large differences in the literacy skill of immigrants from different countries of origin (Coulombe and Tremblay, 2006). Given that patterns of immigration change over time, in part in response to changes in government policy, the projections for this group will either over or under-estimate the likely skills levels of immigrants depending upon whether Canada attracts more or less proficient immigrants than currently is the case.

With these considerations in mind readers are encouraged to use the projections to explore whether the future supply of literacy skill is adequate for meeting the expected level of skill demand, and by extension, the level judged to be needed to meet our collective social and economic objectives. The projections also allow one to consider whether particular sub-groups of the population will continue to bear a disproportionate share of the disadvantage that is associated with having low literacy.

In conclusion, readers are encouraged to keep in sight the fact that the primary goal of this report, and the projections that were produced to support it, was to provoke changes in policy that will alter the very assumptions upon which the projections are based. In this sense, the implicit goal of the current effort is to render the projections wrong.

### Projecting Alberta's literacy profiles: the findings

The following section presents a summary of what the projections reveal at various levels and for various sub-groups. There is nothing remarkable about the analysis, depending as it does upon an exploration of the projected numbers of people at each of skill level and changes in the expected proportions of the population that these numbers imply. Sophisticated statistical techniques would only serve to obscure the obvious – that the peril of low literacy will continue to effect large numbers of Canadian adults, a fact that argues for urgent policy attention.

Figure 3.16 presents the overall results of the projections for Canada for the period 2001 through 2016 in terms of absolute numbers of adults at each proficiency level and the proportions of adults at each proficiency level.

Restricting the analysis to the period 2001 through 2016 increases the likelihood that the fundamental assumption that underlies the projections – that relationships between literacy level and key demographic variables will remain unchanged over the period - will apply.

**Figure 3.16**

**Projected number and proportion of adults aged 16 and over by prose literacy proficiency level, Canada, 2001-2016**

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

The figure reveals a disconcerting fact – the absolute numbers of adults with Level 1 and 2 prose literacy skills rises over the period. By 2016 the projections suggest that there will be 996,950 additional adults with skills below prose literacy level 3.

The figure reveals the disconcerting fact that the proportion of adults whose skill level is judged to place them at risk remains virtually unchanged out to 2016. This spells trouble for Alberta given the degree to which Alberta employers have relied on attracting workers from other jurisdictions. In addition to being short of labour at any skill level the fact that the supply of literate workers is expected to remain stable suggests a need to look elsewhere for skill. Immigration and adult upgrading are the two obvious options open to Alberta.

Extending the analyses out to 2031 reveals several interesting facts, including:

Alberta is predicted to experience population growth almost as high as Alberta with the population increasing by 48% by 2031.

The predicted numbers of adults with prose literacy skills below level 3 is predicted to rise 40% from 1,025,000 to 1,440,000 by 2031.

The proportion of adults with prose literacy below level 3 is likely to drop 2% by 2031, from 44% to 42%. All of this drop will take place in a reduction in the estimated proportion of adults at prose literacy Level 1.

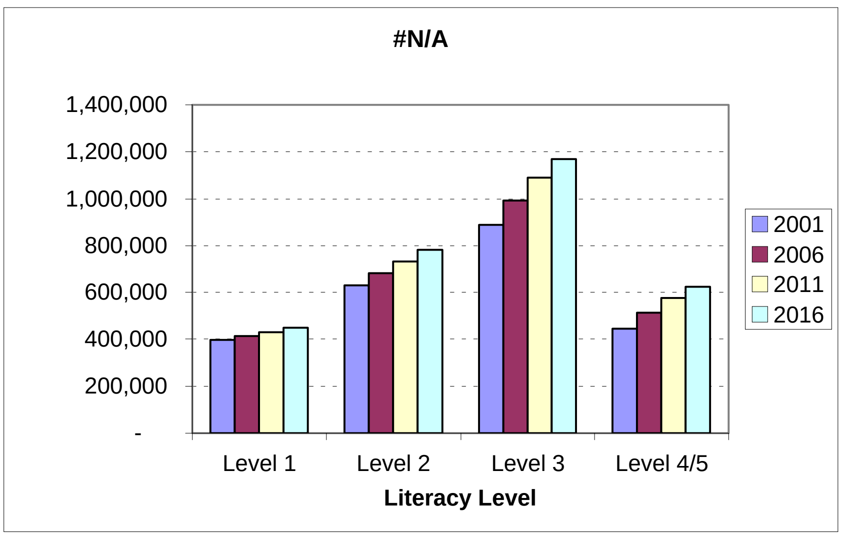
Figures 3.16 A and 3.16 B explore how the distributions of adult literacy skills by proficiency level are likely to evolve over the medium term in Alberta. The goal of this analysis is to determine whether current levels of investment in education and training are likely to generate the additional skill required to meet the rising demand identified in Chapter 2.

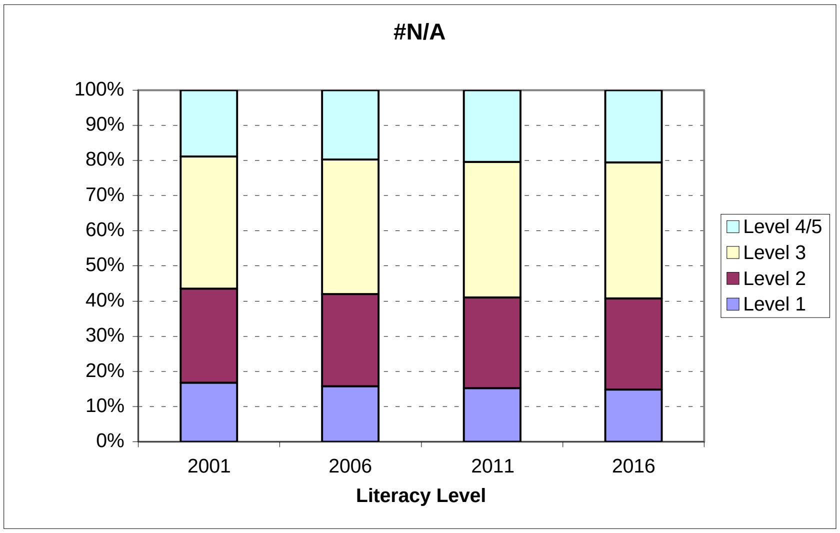
Jurisdictions differ markedly in the their projected population growth rates, in the numbers and characteristics of inter-provincial migrants and immigrants that they attract and in the literacy intensity of employment. These differences have a significant influence on the projected growth rates of low skilled adults in the population by province.

**Figure 3.16**

**Projected numbers and proportions of adults aged 16 and over by prose literacy proficiency level, 5 year intervals 2001-2016, for Alberta**

**Comment:** See march 28 word version for NB charts and tables

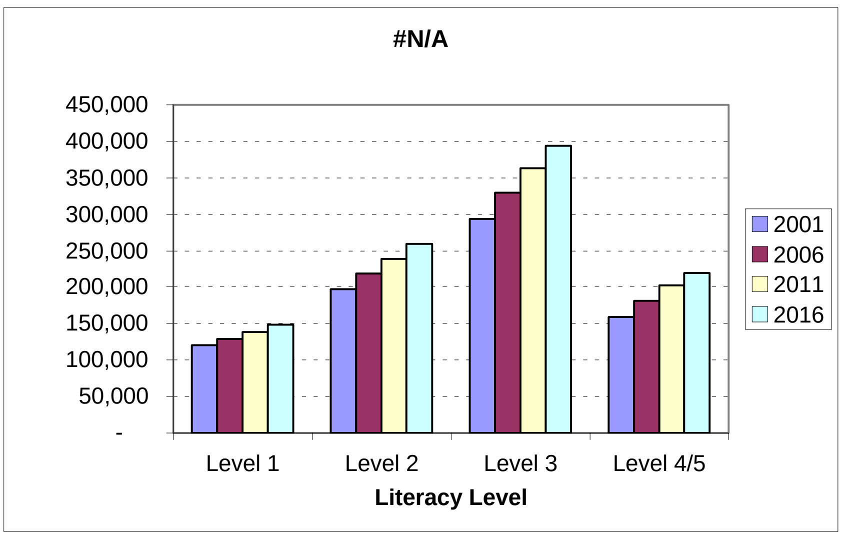


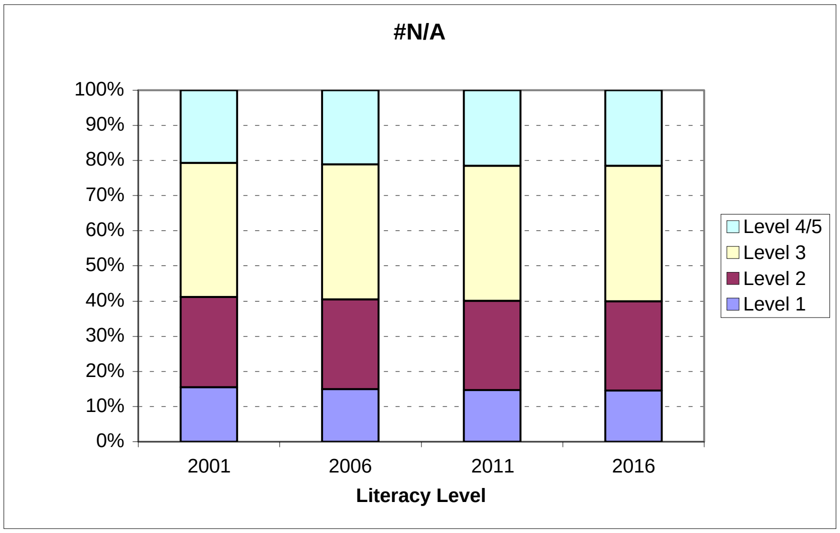



In Alberta the absolute numbers of adults with skills below Level 3 is projected to grow by 181, 587 from 1,051,413 to 1,233,000 from 2006 to 2016, or 17%. The Alberta population is forecast to grow by 43% over the same period.

Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 3%.

**Projected numbers and proportions of adults aged 16 and over by prose literacy proficiency level, 5 year intervals 2001-2016, for Calgary**

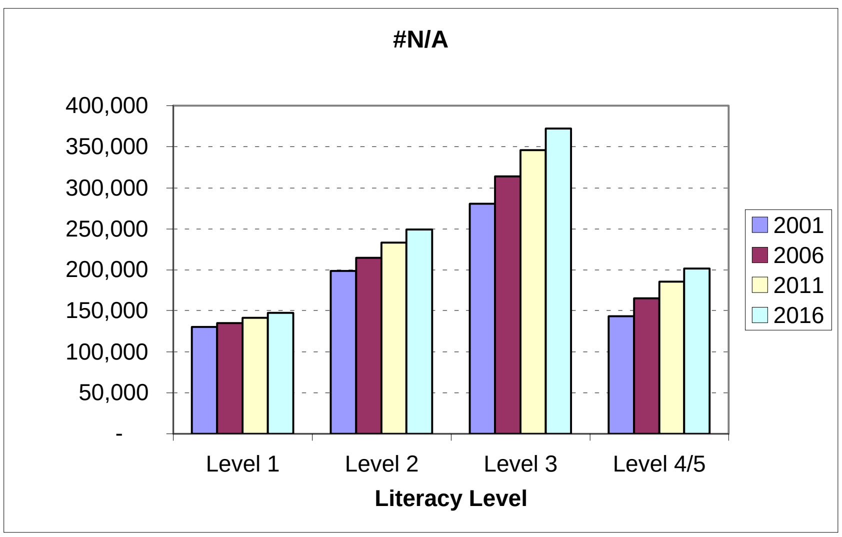


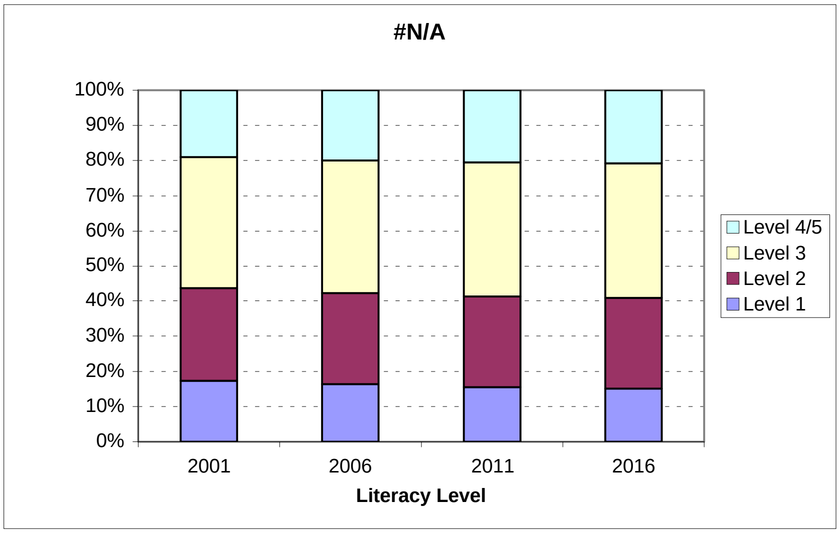



The absolute number of low skilled adults in Calgary is expected to grow by 91,000 from 317,000 to 408,000. The Calgary population is forecast to grow by 33% over the same period.

Over the same period the proportion of adults with skills below level 3 is forecast to shrink by13% from 41% to 40%.

**Projected numbers and proportions of adults aged 16 and over by prose literacy proficiency level, 5 year intervals 2001-2016, for Edmonton**






The absolute number of low skilled adults in Edmonton is expected to grow by 67,000 from 329,000 to 396,000. The Edmonton population is forecast to grow by 29% over the same period.

Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 3% from 44% to 41%.

These findings reveal that Alberta cannot rely upon current levels of investment in education and training to meet the rising demand for literacy skill over the medium term. Thus, there is little doubt that employers will have greater difficulty in finding workers with the literacy skills they need. Public policy makers must find ways to increase the stock of literacy skill if the economic consequences of literacy skill shortages are to be avoided.

The following table, drawn from a recent publication from the Canadian Council for Learning suggests that the distribution of literacy skill by proficiency level remains relatively stable out to 2031.

If one can assume that the rising global supply of literacy skills is going to place serious cost pressure on Canadian workers and firms, then any aggregate skill shortages will reduce the ability of Canadian companies to realize productivity growth through technical and organization upgrading – the only adjustment mechanisms that might protect employment, wage and benefit levels. This suggests a need for policy and programs designed to raise the overall skill level while eliminating any skill shortages.

**Literacy projections summary: changes in population, proportion and total numbers of adults in Canada with low literacy skills (below level 3), 2001-2031**

| Group | Predicted percent population growth 2001-2031 | Predicted percentage increase (decrease) in proportion of adults with prose literacy skills below level 3, 2001-2031 | Predicted percentage increase (decrease) in total number of adults with prose literacy skills below level 3, 2001-2031 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Canada | 33 | (3) | 25 |
| **Province / Territories** | | | |
| Newfoundland and Labrador | (11) | - | (12) |
| Prince Edward Island | 15 | (4) | 4 |
| Nova Scotia | 6 | (2) | 2 |
| New Brunswick | 3 | (3) | (2) |
| Quebec | 13 | (3) | 7 |
| Ontario | 50 | (3) | 42 |
| Manitoba | 10 | (5) | - |
| Saskatchewan | (5) | (3) | (11) |
| Alberta | 48 | (2) | 41 |
| British Columbia | 39 | - | 38 |
| Yukon | (17) | 4 | (11) |
| North West Territories | 13 | 1 | 16 |
| Nunavut | 70 | | 50 |
| **Population groups** | | | |
| Young adults aged 16 to 25 | 2 | (1) | 0.8 |
| Seniors aged 66 and plus | 135 | (12) | 103 |
| Immigrants | 77 | (6) | 61 |
| Less than high school diploma | (33) | 3 | (31) |
| University graduate | 148 | 5 | 212 |

The figures and the summary table reveal several interesting facts, including that:

The jurisdictions differ markedly in their projected population growth out to 2031.

Three jurisdictions – Newfoundland (11%), Saskatchewan (5%) and the Yukon (17) – are projected to face declining populations.

The population is forecast to grow in the balance of the jurisdictions but the growth rate varies significantly from jurisdiction to jurisdiction.

Nunavut (70%), Ontario (50%), Alberta (48%) and BC (39%) are projected to grow more rapidly than the national average (33%).

At the Canada level, the predicted proportion of adults with Level 1 and 2 skills is projected to fall by 3%.

Most jurisdictions are forecast to realize declines in the proportion of adults with skills below Level 3 but the decline varies significantly by jurisdiction. At 6% Nunavut is expected to see the largest decline in the proportion of low skilled adults. Manitoba is also predicted to experience a large decline in the proportion of low skilled adults – 5% fewer by 2031.

Two jurisdictions – Yukon (4%) and the NWT (1%) are expected to see increases in the proportions of low skilled adults.

The absolute numbers of adults with low literacy skill is expected to growth at the Canada level by an estimated 25%.

The growth in the absolute number of low skilled adults varies significantly from jurisdiction to jurisdiction.

Four jurisdictions – Newfoundland (12%), New Brunswick (2%), Saskatchewan (11%) and the Yukon (11%) are all projected to see reductions in the absolute numbers of low skilled adults.

The balance of the jurisdictions will see the number of low skilled adults rise out to 2031, in some cases significantly more than the national average. Ontario (42%) Alberta (41%), BC (38%) and Nunavut (50%) will all see dramatic increases in the numbers of adults with skills below Level 3.

These findings are worrisome. If, as suggested by the COPS projections presented in Chapter 2, the Canadian economy will require higher levels of literacy skill, the traditional sources of supply will not be able to deliver them.

Thus, Canada is faced with the prospect of investing in adult literacy programs for Canadian born adults, attracting workers with the requisite literacy skills from other countries or attracting immigrants with lower literacy skills than needed and offering them enough language and literacy training to raise them to the needed levels.

## Chapter 4: Literacy skill utilization, shortages and surpluses in Alberta

This chapter presents an analysis of literacy skill utilization, shortages and surpluses in Alberta by industry and occupation.

The chapter also explores the social distribution of literacy skill shortage.

The aggregate literacy skill surpluses and shortages are derived by comparing the available supply of skill provided by the 2006 Census of Population, to the literacy skill demand by occupation captured in HRSDC's Essential Skill Profiles. This comparison allows for each worker to be classified as having above the required skill literacy skill level, having skill at the required skill level or below the required skill level.

The analysis was undertaken by detailed occupation and, through aggregation, for industries and industry sectors.Thus, the results reflect the distribution of employment as observed in the 2006 Census of Population.

Similarly, the analysis of the social dimensions of skill shortages reflect the demographic composition of employment as observed in the 2006 Census of Population.

### Skill shortages and surpluses by industry and occupation

Micro-economic theory and evidence provides some context for interpreting these results.

In theory, literacy skill surpluses should provide workers, and the industries for which they work, with a competitive advantage. Specifically, having large proportions of workers with skills above the level thought to be needed to support satisfactory job performance should allow these industries to adopt more knowledge- and information-intense technologies of production and work organization at more rapid rates. There is some evidence that suggests these adjustments will play an important role in driving the productivity growth upon which the competitiveness of the Canadian economy will depend. Research by Boothby (Boothby, 2000) suggests that higher levels of literacy skill than notionally required by the job attract wage premia, a fact that suggests that they have a direct effect on productivity.

Even firms that currently find themselves with adequate skill levels will have difficulty in adopting more knowledge and information-intense technologies of production and work organization. The impact that this has on firm performance will depend upon the degree to which these firms are exposed to competition. The processes that are transforming global markets for goods and services allow lower wage economies to compete on price and quality. Investment in education has provided these economies with the skills to apply the most advanced technologies of production and the most efficient work organizations. The globalization of capital markets and research and development allows these same economies to access capital and technology at the same prices as Canadian firms. The net result is that Canadian firms will come under increasing pressure to increase their productivity.

Firms that are unable to adjust will be forced to compete in other ways.

Some firms will try to maintain market share by reducing prices, something that itself depends on finding ways to reduce costs. This strategy will maintain employment levels but would place downward pressure on wages and benefits that represent roughly 70% of total input costs.

Other firms will try to maintain market share by out-sourcing production to lower cost countries. This alternative would allow firms to remain competitive on global markets but would lead to large reductions in employment. Viewed from a public policy perspective, the question would then become “Do the workers who will lose their jobs have the skills to get stable, well paying replacement jobs?” The answer to this question is “definitely not”.

In contrast, theory suggests that literacy shortages impose serious burden on both individuals and firms.

Individuals face higher probabilities of workplace illness and accident and unemployment and lower wages and benefits.

Firms facing a literacy skill shortage will be less productive and will experience higher levels of workplace illness and accident, production errors and material wastage.

These same firms will also have difficulty adopting the more knowledge- and information-intense technologies of production and work organization required to remain competitive, in large part because their skill level will reduce the efficiency of the associated learning process.

The costs of releasing workers with inadequate skills, and of recruiting suitably qualified replacement workers, will be high and difficult given the pending labour shortage and relatively low literacy skill levels of the fastest growing sources of labour supply. Firms will increasingly be required to consider training both existing workers and new hires to bring their literacy skills up to required levels.

The adjustment processes that firms chose matter to public policy.

Firms that adjust by cutting prices will have a negative impact on individual standards of living, and on the tax revenues that support the social safety net.

Firms that adjust by outsourcing will throw large numbers of workers out of work, greatly increasing demands on the Employment Insurance and Social Assistance systems.

Firms that adjust by adopting more productive technologies of production and work organization will have a mixed impact.

Firms in literacy "surplus" will be able to make the adjustment easily and will require little, if any government assistance.

Firms currently in literacy balance will be required to increase their skill levels, either through training or selective replacement of the least skilled workers.

Firms currently facing a literacy shortage will also be required to increase their literacy skill levels through training or selective replacement.

In both the latter cases government can assist the efficiency of the adjustment process by proving reliable tools for identifying learning needs, by improving the efficiency and effectiveness of instruction, or by improving the efficiency of the market for literacy by improving the match between learning needs and products and services on offer and by certifying skill levels.

In some cases it may be that the high costs of adjustment, the negative consequences of adjustment, and the potential benefits to the broader society argue for public finance of remedial instruction.

Literacy skill is expensive to create and has economic value associated with the impact that it has on labour productivity. Thus literacy skill utilization rates can be thought of as measures of economic efficiency, with higher rates leading to higher output per worker and per capita.

Figures 4.1 and 4.2 profile how the economy utilizes the available supply of literacy skill.

Figure 4.1 compares the proportion of the total aggregate prose literacy supply that the economy is currently using among jurisdictions, data that provides a context for the analysis of literacy skill shortages and surpluses that follows.

**Figure 4.1**

**Aggregate prose literacy utilization for the population, peak demand, Canada and the jurisdictions, 2006**

**Comment:** Same chart and table as Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

The figure reveals several important facts, including that:

- A large fraction of the available aggregate literacy supply goes untapped. At the Canada level only 66% of the available supply gets put to use in the labour market under peak demand.
- The proportion of aggregate literacy supply that gets utilized by the labour market varies considerably by jurisdiction. Newfoundland utilizes the lowest proportion of the available aggregate literacy supply at peak demand (53%) whereas Alberta utilizes the highest proportion (71%).

Given Alberta's high aggregate utilization rate the province will have more difficulty than most in realizing large GDP gains by making more effective use of the available pool of skill.

Figures 4.1 shows that at the aggregate level Canada has a significant prose literacy surplus. Aggregate prose literacy supply exceeds peak-level aggregate literacy demand by 2,336,538,640 points or 34%. Thus, at first blush it would seem that the economy is unlikely to face overall supply constraints. One could, however, think of the unutilized literacy supply as a sign of market inefficiency, one that represents a huge untapped economic potential.

Whatever the interpretation the real question for policy is whether labour markets are allocating literacy efficiently to occupations i.e. do workers have the literacy skills needed to perform well on the job. Figure 4.2 begins to explore the issue of market efficiency by comparing the literacy supply utilization rates of the employed population in each jurisdiction.

**Figure 4.2**

**Aggregate prose literacy utilization for the employed population, peak demand, Canada and the jurisdictions, 2006**

**Comment:** Same chart and table as Ontario report

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

The figure reveals several important facts, including that:

For the employed population at the Canada level literacy demand exceeds literacy supply by 39,746,506 points, or roughly 1%. Thus, for the current distributions of employment and literacy skill Canada faces a slight literacy skill shortage.

The rate of literacy skill utilization varies significantly by jurisdictions, ranging from a high of 93% in the Yukon to a low of 104% in Newfoundland. Jurisdictions with utilization rates below 100% have literacy skill surpluses, those with rates above 100% face literacy skill shortages.

Literacy skill demand of the employed population exceeds supply in 5 jurisdictions. These literacy skill shortages are likely to constrain rates of technological and organizational adjustment and hence reduce long-term economic performance in these jurisdictions.

Literacy skill demand of the employed population is less than supply in 7 jurisdictions. These literacy skill surpluses represent untapped economic potential.

The Alberta economy demands 97% of the available aggregate supply of literacy skill in the employed population. Thus, the performance of the Alberta economy is not being constrained by literacy skill shortages at the aggregate level. This finding does not, however, preclude that the market that matches worker skills with job demands might create surpluses and/or shortages in specific occupations.

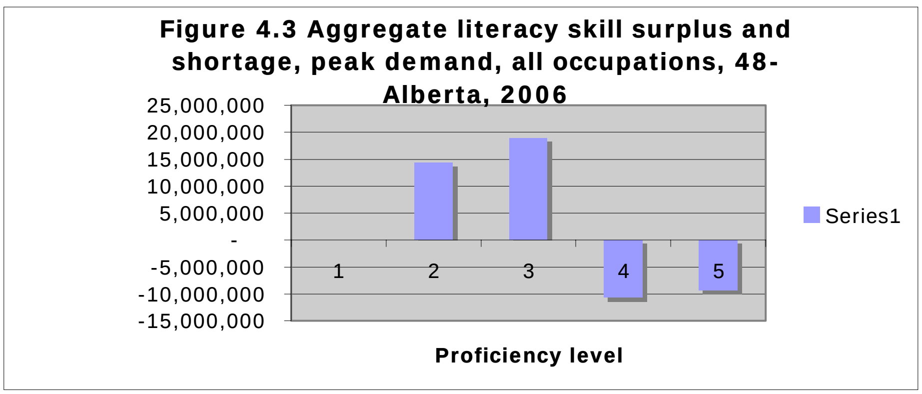
These findings suggest a need for policies and programs that would both serve to increase the demand for literacy skill at work and that would help to create additional literacy skill supply. The variation among jurisdictions suggests that the balance between supply and demand-side measures should vary from province to province.

Figures 4.3 extends the analysis of labour market efficiency by displaying the overall balance of supply and demand for Alberta for all industries and occupations by proficiency level demanded by the job at peak levels.

**Figure 4.3**

**Literacy skill surplus, of literacy skill demand by levels and by proficiency level demand, peak demand, all occupations, 2006, Alberta**

**Comment:** Use chapter 2.xls sheet Figure 4.3 Table complex – refresh to get NS then new table and chart




The figure reveals several important facts, including that:

When worker skills are matched to job demands over all jobs in Alberta the province has an aggregate literacy skill surplus of 13,409,350 points, or roughly 20 points per worker, a fact that suggests that current levels of demand are insufficient to make full use of the available supply. Comparing aggregate literacy supply and demand by the level of literacy skill demanded by the job reveals a mixed pattern of skill surpluses and shortages.

There is no aggregate shortage for jobs demanding Level 1 prose literacy skills in Alberta because, under peak demand, all jobs require level 2 or above.

The aggregate supply of literacy skill exceeds the peak demand for workers in Level 2 jobs in Alberta. Alberta workers in Level 2 jobs possess 14,359,050 more points of literacy than required under peak demand. This represents an average surplus of 12 literacy points per worker in Level 2 jobs, an amount associated with roughly half a year of education.

The aggregate supply of literacy skill exceeds the peak demand for workers in Level 3 jobs in Alberta. Alberta workers in Level 3 jobs possess 18,945,850 more points of literacy than required under peak demand. This represents an average surplus of 22 literacy points per worker in Level 3 jobs, an amount associated with slightly less than one year of education.

Alberta workers in Level 4 jobs lack a total of -10,611,900 literacy points, an average shortage of 45 points, roughly equal to the literacy skill gain associated with almost two additional years of education.

Alberta workers in Level 5 jobs lack a total of -9,283,650 literacy points, a skill deficit that represents an amount of 68 points per employee, roughly equivalent to the additional literacy normally gained through two and three quarters additional years of education.

Figures 4.4 through 4.7 explore the industrial and occupational distribution of literacy skill shortages in Alberta.

Figure 4.4 lists the industries in Alberta that have the highest proportions of employment below the required level of prose literacy skill.

Figure 4.5 lists the industries in Alberta that have the highest absolute numbers of workers with skills below the required level of prose literacy skill.

Figures 4.6 and 4.7 provides comparable information by occupation.

These industries and occupations will have the most difficulty in adopting more productive technologies of production and work organization.

**Figure 4.4**

**Proportion of workers below the required literacy skill level, selected industries, Alberta, 2006**

**Comment:** Needs to be created using Ontario chart as a model. The March 28 version of NS report has an example. Use Figure 4 – age x PR March 16.xls industry and occupation sheets

**Figure 4.4 Proportions of workers below the required literacy skill level, selected industries, 48-Alberta, 2006**

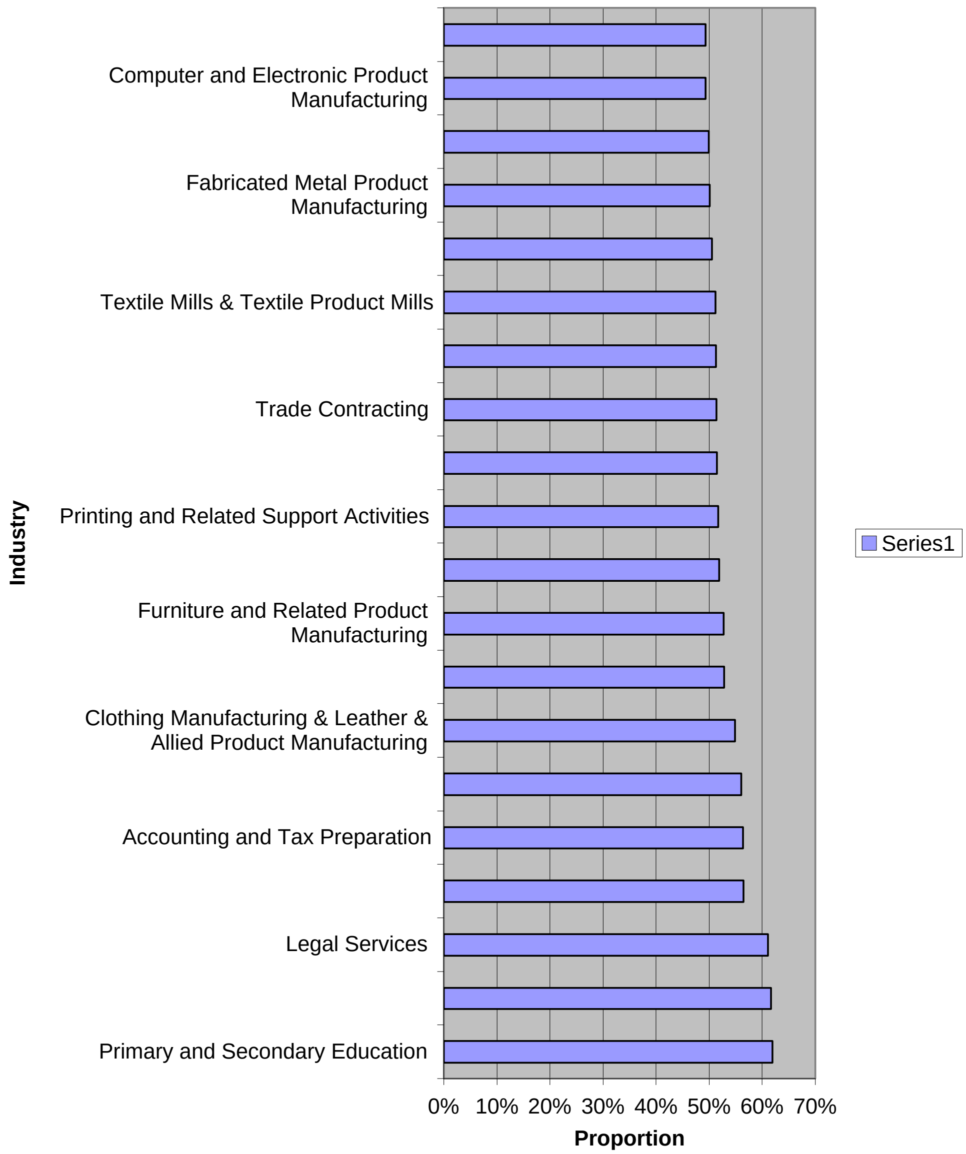


**Figure 4.5**

**Number of workers below the required literacy skill level, selected industries, Alberta, 2006**

Comment: same

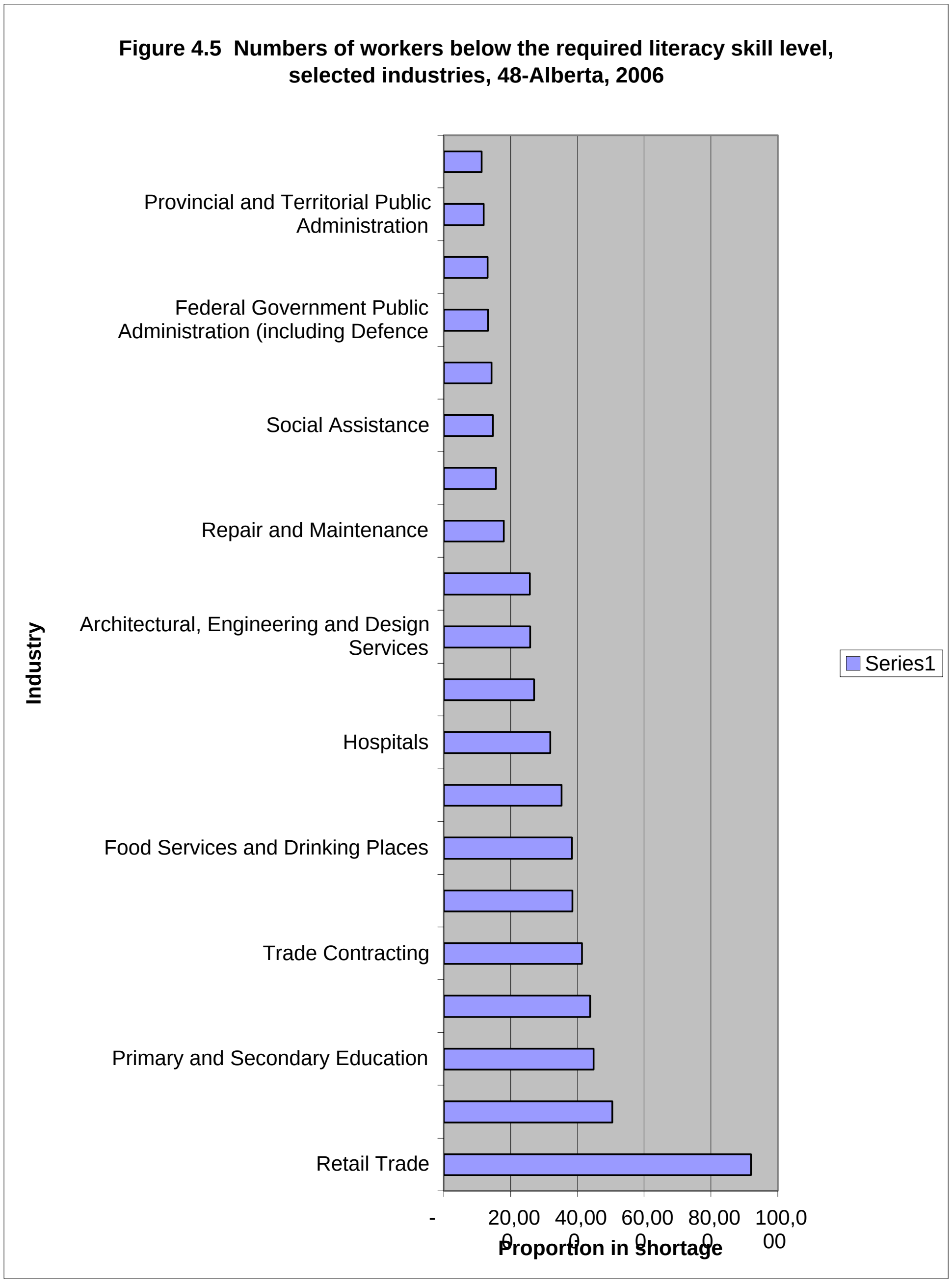


Figure 4.5 Numbers of workers below the required literacy skill level, selected industries, 48-Alberta, 2006
Industry
Provincial and Territorial Public Administration
Federal Government Public Administration (including Defence
Social Assistance
Repair and Maintenance
Architectural, Engineering and Design Services
Hospitals
Food Services and Drinking Places
Trade Contracting
Primary and Secondary Education
Retail Trade
Series1
-
20,000
40,000
60,000
80,000
100,000
Proportion in shortage

**Figure 4.6**

**Figure 4.6**

**Proportion of workers below the required literacy skill level, selected occupations, Alberta, 2006**

Comment: same

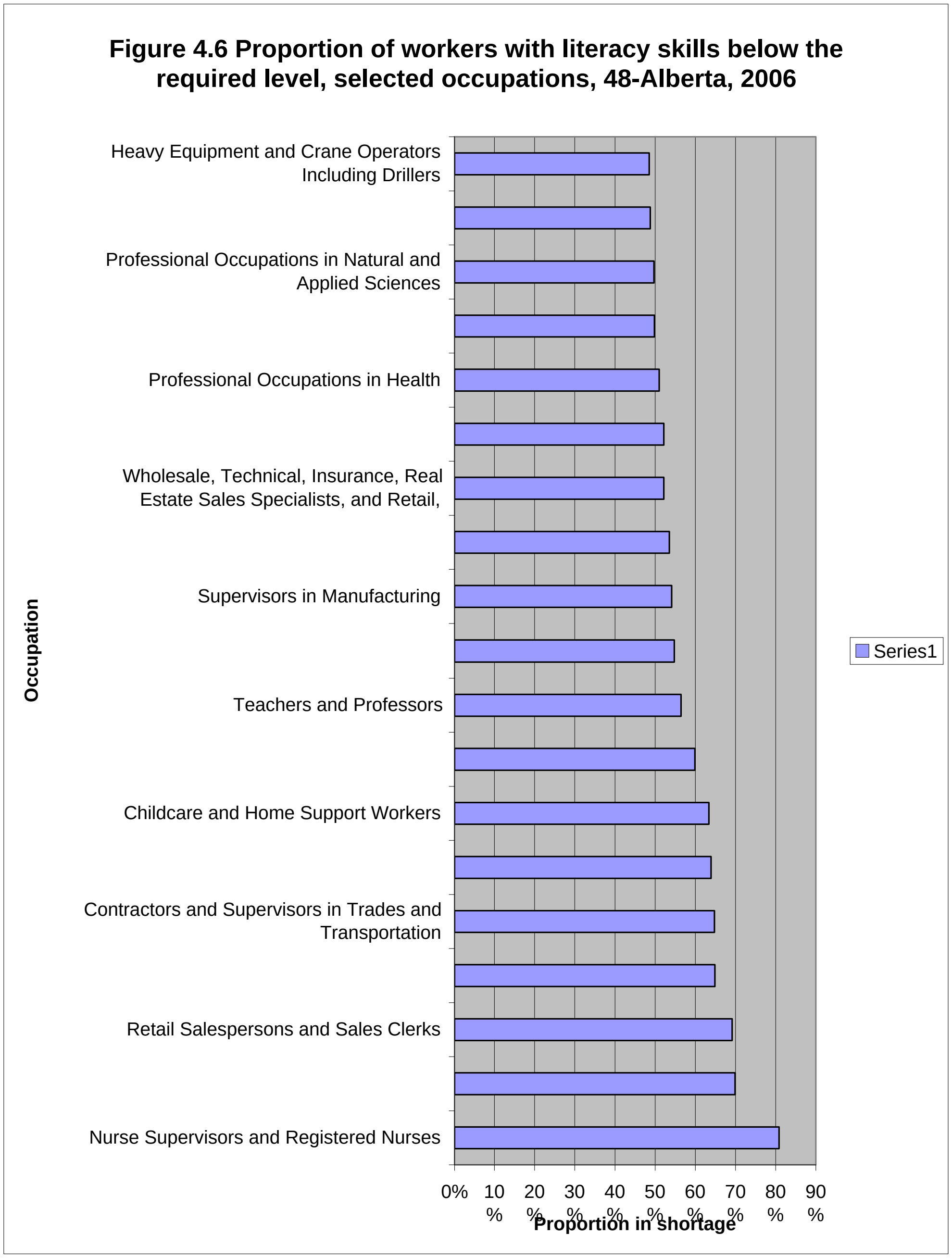


Figure 4.6 Proportion of workers with literacy skills below the required level, selected occupations, 48-Alberta, 2006
Heavy Equipment and Crane Operators Including Drillers
Professional Occupations in Natural and Applied Sciences
Professional Occupations in Health
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail,
Supervisors in Manufacturing
Teachers and Professors
Childcare and Home Support Workers
Contractors and Supervisors in Trades and Transportation
Retail Salespersons and Sales Clerks
Nurse Supervisors and Registered Nurses
Occupation
0%
10 %
20 %
30 %
40 %
50 %
60 %
70 %
80 %
90 %
Proportion in shortage
Series1

**Source:** IALSS 2003, Census 2006 and ESP, 2008.

**Figure 4.7**
**Numbers of workers below the required literacy skill level, selected occupations, Alberta, 2006**

Comment: same

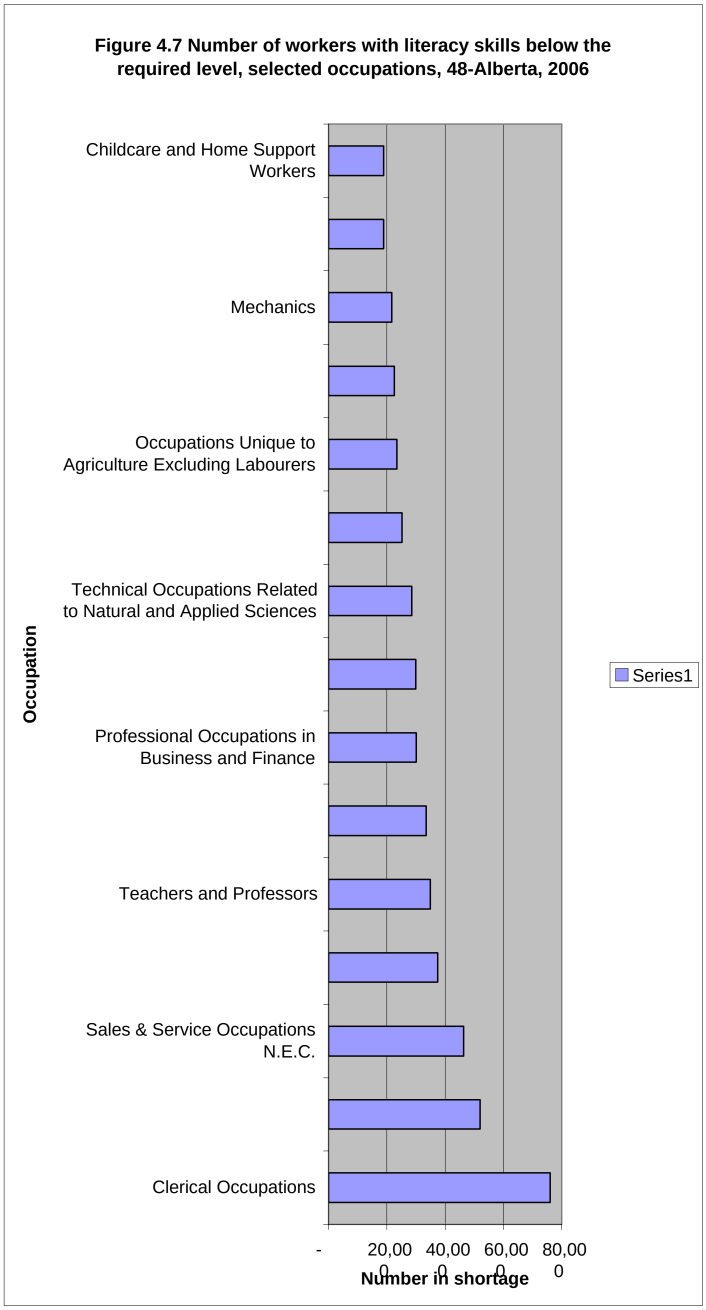


Figure 4.7 Number of workers with literacy skills below the required level, selected occupations, 48-Alberta, 2006
Childcare and Home Support Workers
Mechanics
Occupations Unique to Agriculture Excluding Labourers
Technical Occupations Related to Natural and Applied Sciences
Professional Occupations in Business and Finance
Teachers and Professors
Sales & Service Occupations N.E.C.
Clerical Occupations
Occupation
Series1
-
20,000
40,000
60,000
80,000
Number in shortage

## The social dimension of skill surpluses and shortages

As noted in Chapter 2 of this volume, literacy skill has a profound impact on the economic success of individuals, firms and the overall economy. Workers with relatively higher skills work more, experience less frequent and shorter periods of unemployment, earn higher wages and experience less workplace illness and accident. Workers with literacy skills above the level notionally demanded by their jobs have been shown to earn higher wages, a finding that suggests that literacy confers productivity benefits (Boothby, 2000).

The first part of this chapter has shown that particular industries and occupations face relatively huge literacy challenges. The balance of this chapter is devoted to exploring the social dimensions of literacy skill shortages in Alberta.

The social distribution of literacy skill shortages will condition the responses of workers, their employers and the government to the problem.

For example, older workers will be less likely to participate in literacy upgrading because they have less time to recover any economic benefits that higher skills might precipitate. Similarly, firms may be less likely to finance literacy upgrading for their older workers as they will have less time to recoup the expected benefits.

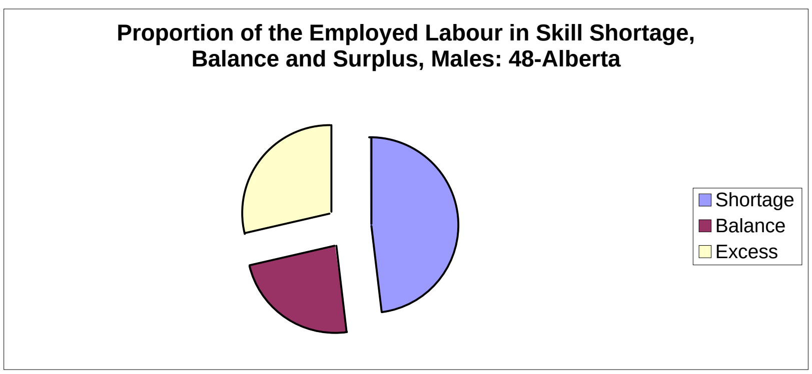
Figures 4.9 through 4.16 reveal the degree to which literacy skill shortage is concentrated within particular population sub-groups of the population.

Figure 4.9 explores literacy skill shortages, balances and surpluses by gender.

**Figure 4.9**

**The proportion of the experienced labour force in skill shortage, balance and surplus by gender, Alberta, 2006**

**Comment:** use Figure 4 – sex March 16.xls to update table and chart




The figure reveals that employed men and women in Alberta face roughly the same level of risk of being in skill shortage – 48% compared to 45%. Roughly half of both groups have prose literacy skills than are notionally required by their occupation under peak demand conditions.

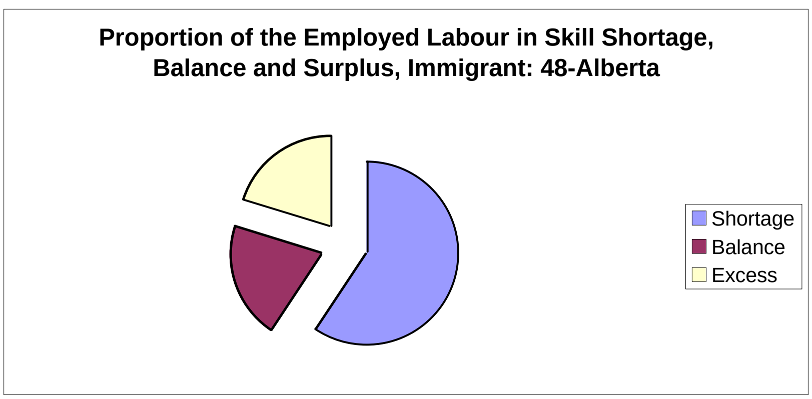
Women have a higher probability of being in skill surplus, a fact that can be attributed to the fact that, as a group, women have higher average literacy skill levels. 32% of employed women in Alberta have surplus literacy skills v.s. 29% for men.

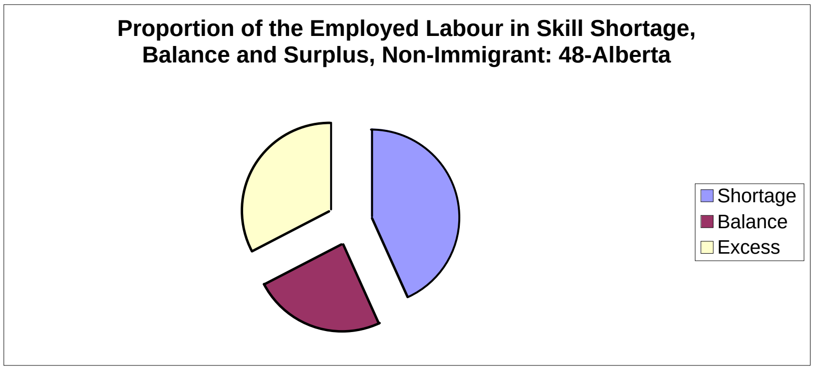
Figure 4.10 documents the issue of immigration in literacy skill shortage.

**Figure 4.10**

**The number and proportion of current employment in skill shortage and proportion of total group by immigrant status, Alberta, 2006**

**Comment:** Figure 4 imm x PR march 16.xls






The figure reveals that immigrants in Alberta face a 16% higher risk of being in skill shortage than their non-immigrant peers. 59% of immigrants in the experienced labour force are in skill shortage compared to 43% of their non-immigrant peers.

This result is to be expected. While immigrants have higher levels of educational attainment than non-immigrants their English and French language literacy skill levels are lower. Significant numbers of immigrants display skill shortages and they represent significant proportions of employment in some industries and occupations. The proportion of immigrants in literacy skill shortage helps to explain the relatively poor labour market performance of recent cohorts of immigrants observed in related analysis of the impact of literacy skill upon employment and wages of immigrant adults (Riddell and Green, 2008).

Immigrants in the employed labour force are also much more likely to be in skill surplus than their Canadian-born peers – 33% v.s. 20%.

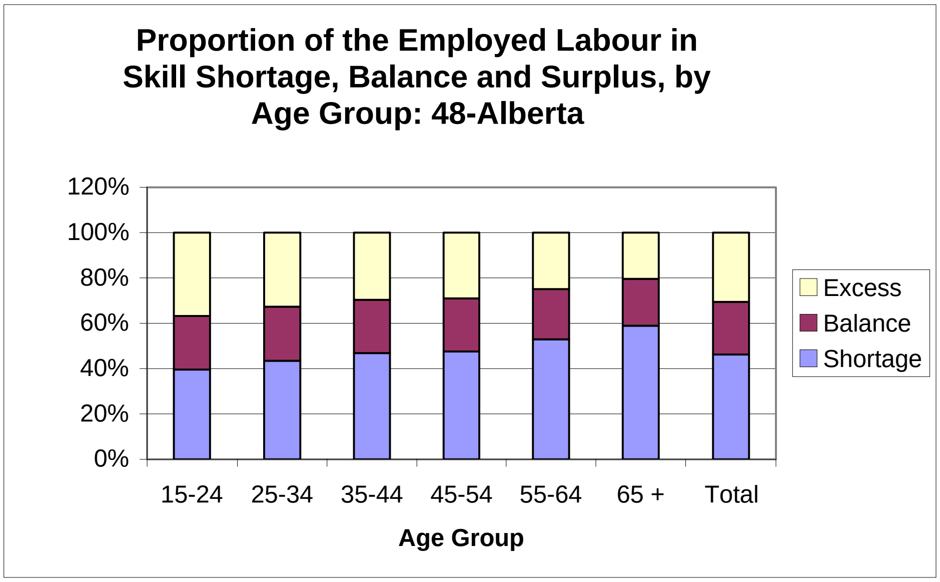
Figure 4.11 documents the issue of age in literacy skill shortage.

The distribution of literacy skill shortage by age group is important as it will condition the likely returns to remedial investment, and hence the probability of investment. If literacy skill shortages are concentrated in older workers then they, and their employers, will be less likely to invest.

**Figure 4.11**

**The number and proportion of current employment in skill shortage, balance and surplus by age group, Alberta, 2006**

**Comment:** Figure 4 – age March 16.xls




The figure reveals that literacy skill shortages in the Alberta employed population are high for all age groups, ranging from a low of 40% to a high of 59%.

The rate of skill shortage rises steadily with age, a fact that largely mirrors the underlying relationship of literacy skill to educational attainment.

Employed youth aged 16 to 24 face the lowest level of risk of being in shortage but over a third of this group (40%) are judged to be in shortage.

Employed seniors aged 65 years of age and over face the highest risks of being in literacy skill shortage (59%). This finding suggests that the seniors who remain in the labour force have a very high probability of having low skills.

Figure 4.12 documents the issue of aboriginal status literacy skill shortage.

**Figure 4.12**

**The proportion of current employment by skill status by aboriginal status, Alberta, 2006**

**Comment:** Figure 4 –Aboriginal X PR….xls (not march 16 version – it won't refresh



The figure reveals that a significant proportion, 44%, of employed aboriginal adults in Alberta are in skill shortage.

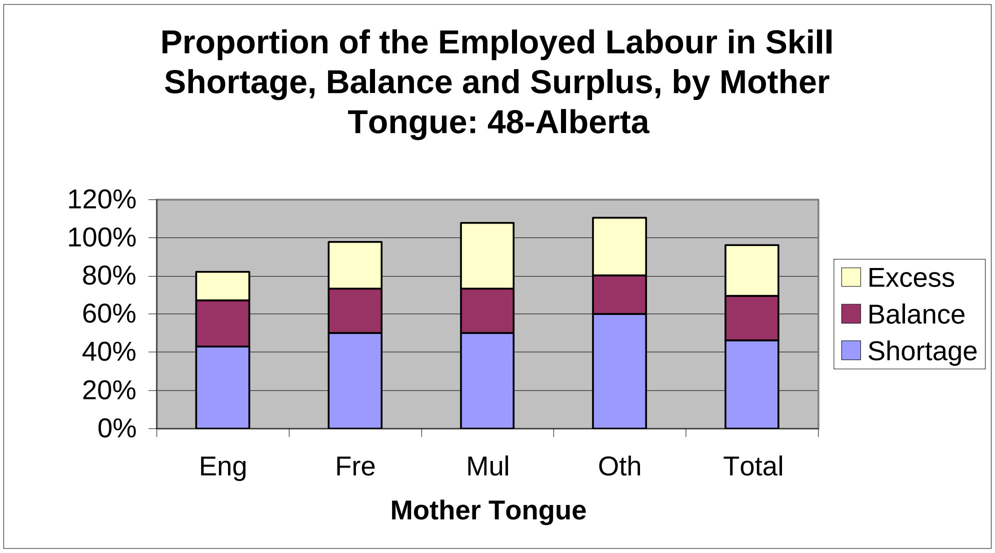
Employed Aboriginal adults in Alberta actually face a slightly lower risk of being in skill shortage than their non-Aboriginal peers – 44% v.s. 46%.

Figure 4.13 provides the same information by official language. This is useful information on the degree to which literacy problems might be confounded with language problems. The figure displays four groups those with English as a mother tongue, those with French as a mother tongue, those who reported having multiple mother tongues and those with a mother tongue other than English or French.

**Figure 4.13**

**The proportion of the employed labour force by skill status by official language, Alberta, 2006**

**Comment:** Figure 4 – Mother_tongue X ….xls not March 16




**Source:** Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

The figure reveals that non-official language adults face much higher levels of risk of being in literacy skill shortage than their official language peers. For example, 60% of these "other language" adults in the experienced labour force are in skill shortage v.s. 43% of their English-speaking peers.

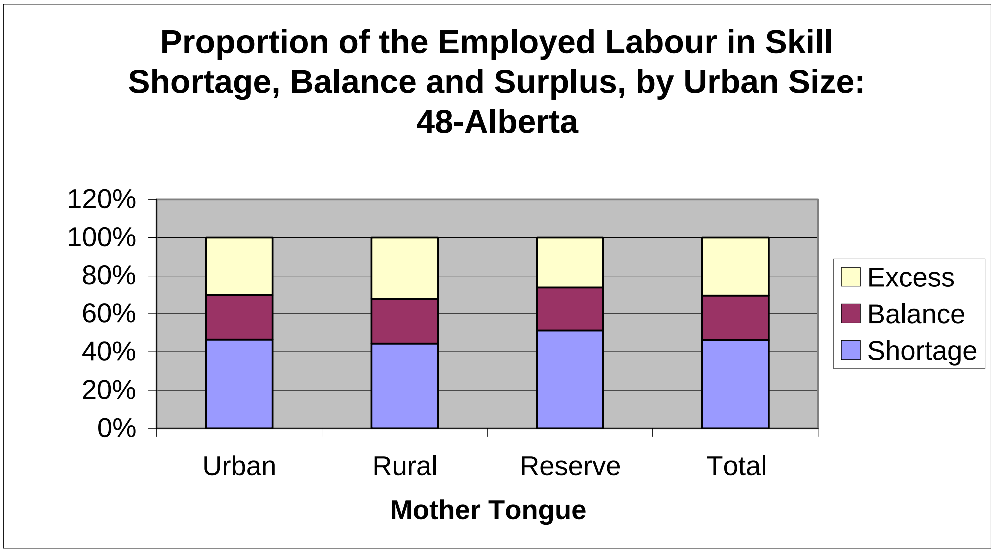
This finding is to be expected. Analysis of data from the International Survey of Reading Skills (ISRS) reveals that non-official language immigrants possess much lower oral language fluency in English or French, and prose literacy skill levels, than their non-immigrant peers (DataAngel, 2009).

Figure 4.14 documents the issue of urban density in literacy skill shortage. Reserves are classified separately.

**Figure 4.14**

**The proportion of current employment in skill shortage by urban density, Alberta, 2006**

**Comment:** Figure 4 – urban x… pr.xls




**Source:** Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

The figure reveals that a large proportion, 46%, of employed urban adults in Alberta are in skill shortage. The proportions in rural areas (44%) are slightly lower and for residents of Indian Reserves (51%) are slightly higher.

The foregoing figures reveal that different groups in the population face much higher probabilities of being in literacy skill shortage based on single variables. Figure 4.18 provides estimates of the relative risks faced by different groups of adults in Alberta compared to a reference group of universty educated seniors living in British Columbia who have multiple mother tongues.

**Figure 4.15**
**Log odds of being in literacy skill shortage, selected groups, Alberta, 2006**

**Comment:** Use same chart as ontario

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Groups are sorted by relative risk.

Source: Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

The figure reveals large differences in the likelihood that different groups of Canadian workers will be in literacy skill shortage. Workers with less than a high school education face the highest unadjusted risks, 94% more than the reference group of workers aged 65 and over with a university degree and multiple mother tongues. Immigrants (55%), residents of Census Metropolitan Areas (35%), trade vocational graduates (23%), workers with only high school (20%) and workers with French mother tongues (14%) all face higher levels of risk of being in shortage. The likelihood of workers being in shortage rises steadily with age. Workers aged 16 to 25 are 41% less likely than workers aged 65 and over. Workers in Alberta are more likely to be in shortage than their peers in British Columbia and Saskatchewan but face lower levels of risk than all the other provinces.

The fact that some groups face higher risks of being in shortage can be attributed, in part, to the influence of underlying characteristics on the risk of being in shortage. Figure 4.19 displays the adjusted odds of being in shortage after adjustment for a range of these characteristics including age, education, mother tongue, immigrant status and province of residence.

**Figure 4.16**

**Adjusted likelihoods of being in prose literacy shortage, selected characteristics, 2006**

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

The figure reveals that:

- Employed adults with less than high school education face the highest level of adjusted risk. Their risk is 90% more than the reference group of employed adults aged 65 and over with a university degree and multiple mother tongues.
- Employed adults in Newfoundland, New Brunswick and Prince Edward Island all face higher levels of risk than their Alberta peers.
- Employed immigrants and adults with non-English and non-French mother tongues also face higher levels of risk.
- The risk of being in literacy skill shortage drops steadily with age.

The fact that the risk of being in literacy skill shortage varies significantly among population sub-groups suggests that the elimination of literacy skill shortages would help to reduce the level of wage and income inequality that face some groups, most particularly adults with low levels of education, immigrants and non-official language speakers.

### Summary and conclusion

The figures presented in this chapter reveal several important facts, including that:

Literacy skill is distributed unequally among industries and occupations, a finding that reflects the intrinsic differences in literacy skill demanded by different jobs

All industries and occupations include significant proportions of workers with both skill shortages and skill surpluses.

Literacy skill deficits effect particular population sub-groups more than others.

## Chapter 5: What would be required to overcome current literacy skill shortages in Alberta

This chapter reflects upon the measures that would be required to overcome Alberta's literacy skill shortages through remedial education. More specifically this chapter profiles the learning needs of different groups of workers, and provides estimates of the cost of providing a "best practice" instructional response designed to raise literacy skill to the required level.

The results presented are based on projected distributions of literacy market segments by industry and occupation. The projected distributions were obtained by first imputing prose literacy scores onto a 2006 Census micro file using the relationships between background characteristics and literacy revealed in the IALSS. Market segment membership was then imputed onto the Census file for adults at prose literacy Levels 1 and 2 using the relationships observed between background characteristics and literacy revealed in the ISRS study.

The chapter extends and refines a segmentation analysis of the Canadian literacy market based on the 2005 International Survey of Reading Skills (ISRS). This analysis defined different groups of adults that share common literacy learning needs, "best practice" instructional responses for each group and first order approximations of the costs of raising each group to prose literacy Level 3 but which did not explore the industrial and occupational dimension of the problem (See text box).

### The International Survey of Reading Skills

The initial market segmentation analysis used latent class analysis to identify different groups of learners at Levels 1 and 2 based upon patterns of strength and weakness on a battery of clinical decoding and comprehension tests.

In latent class analysis individuals are organized into groups or classes based on their patterns of performance on the five component skills. More specifically, the scores of the five components skill test are analyzed using Latent Class Analysis (LCA) methods (Lazarsfeld and Henry, 1968; Patterson, Dayton and Graubard, 2002). LCA is a statistical tool for clustering subjects based on categorical variables. This analysis yields a probabilistic classification for each survey participant, where the classes are represented by different tendencies to perform in a certain way (more formally, each class is characterized by its conditional response probabilities) in each of the five components. Latent class analysis was used in this context to identify relatively homogeneous groups of learners that share common sets of learning needs. Latent classes were then situated on the overall prose literacy scale and profiled demographically.

The initial analysis identified four groups as set out in the table below:

Summary of decoding and comprehension level by Latent Class.

| Latent class | Print skills | Comprehension skills |
|---|---|---|
| Class A | Very limited | Limited |
| Class B | Limited | Limited |
| Class C | Limited | Adequate |
| Class D | Adequate | Adequate |

Subsequent analysis resulted in latent classes A and B being divided into two sub-classes depending upon whether they were immigrants or not.

Two additional classes – Class E and Class F were identified for the present analysis. Class E includes adults who are currently at Level 3 working in jobs that demand Level 4 or 5 and Class F are adults who are currently at Level 4 who are currently working in jobs that demand Level 5. Thus the present analysis defined 8 distinct market segments for each language of instruction, English and French as shown below.

| Latent class | Print skills | Comprehension skills |
|---|---|---|
| Class A1 | Very limited | Limited |
| Class A2 | Very limited | Limited |
| Class B1 | Limited | Limited |
| Class B2 | Limited | Limited |
| Class C | Limited | Adequate |
| Class D | Adequate | Adequate |
| Class E | Adequate | Adequate |
| Class F | Adequate | Adequate |

Separate latent class analyses were undertaken for English and French respondents in order to capture fundamental orthographic differences in the languages and differences in the demographic characteristics of immigrants in each population.

Each latent class was then profiled demographically to identify characteristics that might influence the design of remedial programs. Experts then used this information to propose “best practice” remedial responses for each group and to generate first-order approximations of the cost of raising adults to prose literacy Level 3.

The current analysis extends the initial analysis in three ways.

First, rather than estimating the cost of raising all adults to prose literacy Level 3 the analysis provides estimates of the cost of raising workers to the level of literacy associated with satisfactory job performance.

Second, the analysis required the development of “best practice” program responses for moving adults from Levels 3 to 4 and Level 4 to 5.

Finally, the analysis provides estimates of the cost of remedial instruction by industry and occupation within provinces and territories.

Figures 5.1A and 5.1B provide estimates of the size of each market segment for adults in literacy skill shortage.

**Figure 5.1A**

**Estimated size of English market segments, Alberta, 2006**

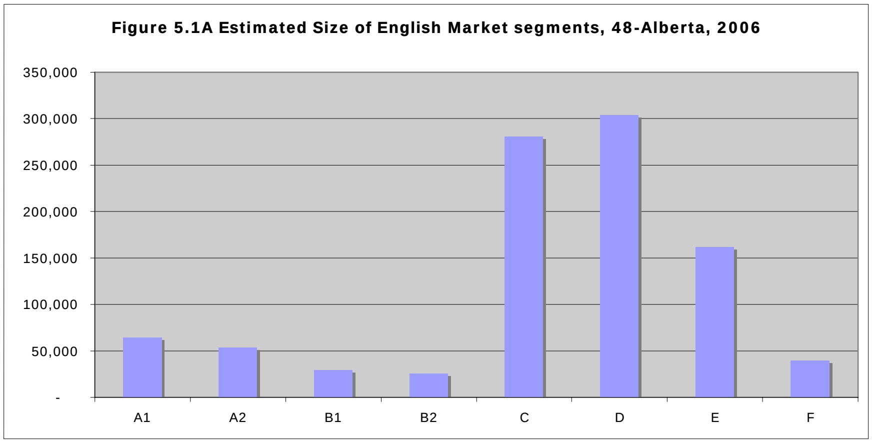
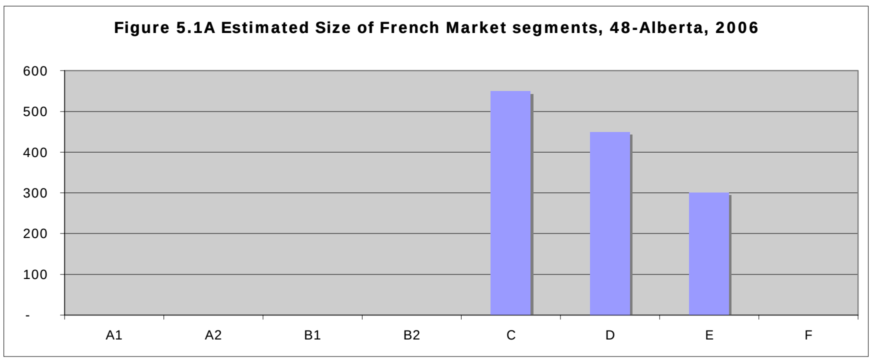



**Figure 5.1B**
**Estimated size of French market segments, Alberta, 2006**




The figure reveals several important facts, including that:

The analysis identified a total of 960,000 potential literacy learners in Alberta, 958,000 English learners and 1,300 French learners.

The largest segments in the Alberta English literacy market are Segment C, that accounts for 29% of the total learners, and Segment D, that represents 32% of potential learners.

In the English literacy market in Alberta Segments D, E and F account for 53% of the potential learners. Adults in these market segments display no weaknesses in their decoding and comprehension skills i.e. they have made the transition from “learning to read” to “reading to learn”. Nevertheless, they lack the strategic reading skills to have an 80% or better probability of mastering reading tasks at the level demanded by their jobs.

Thus, 47% of workers in English literacy skill shortage in Alberta have discernible weakness in their decoding and comprehension skill.

English market segment E, workers who are at Level 3 but who need to be at Level 4, represent 17% of the potential learners.

The other Alberta English market segments are relatively small.

The French literacy market in Alberta is dominated by segments C and D – together they account for 77% of the market.

Figures 5.2A and 5.2B plot the estimated costs of providing sufficient remedial instruction to raise literacy skill levels enough to eliminate literacy skill shortages in Alberta, information that should provide readers with a sense of the size of the challenge facing these workers, their employers and their governments.

The cost estimates are based upon the "best practice" interventions identified for each literacy market segment in the analyses published in ***Reading the Future: Planning for Canada's Future Literacy Needs*** (CCL, 2008) and a set of unit costs published in ***Addressing Canada's Literacy Challenge: A Market Segmentation Analysis*** (DataAngel, 2009).

The cost estimates were developed by a group of Canadian experts that are actively involved in delivering various sorts of efficient and effective remedial literacy programs. While every effort has been made to base these estimates in reality, the estimates should be taken as indicative of the required magnitude of investment, not as definitive.

As noted above the cost estimates are meant to reflect the average costs of bringing each group of learners to the level demanded by their occupation. For adults that have not worked in the past 5 years prose literacy Level 3 has been assumed in estimating aggregate costs. For groups with average skills at prose literacy Level 1, this involves estimating the cost of first raising the learner's skills to prose literacy Level 2 and then estimating the cost of raising learners the same learners to level 3.

All cost estimates are based upon average costs that are thought to be reasonable approximations for the group in question. While the actual costs of delivering programs to each group are likely to vary considerably for specific groups of learners the experts judge that the amounts allocated are sufficient on, on average, to achieve the desired result.

The cost estimates for each group are derived in two stages.

First, the direct costs of instruction are estimated by multiplying the estimated average number of hours needed to raise learners to the next level by the estimate of the number of learners in the respective group. The model assumes a standard rate of pay for instructors of $35 per hour, the prevailing rate for the Foundations Program delivered by Douglas College.

Readers should not take this as an endorsement of a college-based solution to Canada's literacy problems. The fact that this rate is considerably higher than many literacy instructors currently get paid means that the cost estimates presented in the report are on the high side, with the result that the estimated rates of return to literacy investments are conservative. At a minimum the $35 rate is high enough to attract and retain instructors of the requisite quality.

Second, the indirect costs of supporting instruction are estimated. Separate estimates are derived for:

Recruitment costs

Diagnostic costs

Retention costs

Certification costs

Facilities costs

Participant supplies

Other infrastructure costs

Recruitment costs are those costs associated with securing participation in programs. Recruitment costs include marketing, outreach and basic program intake operations.

Diagnostic costs are those costs incurred in undertaking formative assessment to establish learning goals, learner needs and to establish baseline skill levels.

Retention costs represent those costs that are incurred to provide sufficient learner support to ensure retention to completion. These include funding to support personal contact throughout the program and for incidental expenses such as daycare, transportation, etc.

Certification costs are costs incurred at program exit to establish, through comparison to initial skill level, learning gain.

Facilities costs include things such as classroom rentals.

Participant supplies include instructional resources such as paper, pens, workbooks, etc.

Other infrastructure costs include institutional overheads.

As for the direct costs of instruction indirect costs are estimated as averages that are judged to be sufficient overall. Clearly, the average costs mask considerable variation in what it would cost to offer programs to specific sub-groups of learners, including aboriginal Canadians.

Direct and indirect costs are then converted to a per point basis. Aggregate cost estimates are then derived for each segment by multiplying the average number of points to the desired proficiency level by the per point unit costs for each segment.

No effort has been made to estimate the cost of training the instructors that will be needed to deliver the programs. We assume that these costs can be absorbed in the current post-secondary education budgets.

No estimates have been provided for the cost of developing and administering a system of instructor certification, nor for providing the general system supports such as the development of more efficient and effective curricula and delivery systems. Current federal and provincial budgets are judged to be sufficient for these purposes.

It should also be noted that these costs exclude the cost of any related language training. The ISRS study classified respondents into one of six groups based upon their assessed oral language proficiency. Average oral language proficiency scores for English segments C and D, and for French segments C, D and B1, fell in the highest two levels. Average scores for the other segments were considerably lower, suggesting a need for language training.

By way of reminder, the foregoing CCL analyses identified 6 groups of potential learners in each language. The current costing exercise includes estimates for 2 additional segments i.e. adults currently at Level 3 whose occupation demands a peak skill level of Level 4 or 5 (Market segment E) and adults currently at Level 4 whose occupation demands a peak skill level of Level 5 (Market segment F). In both cases the unit costs associated with raising adults in market segment D to Level 3 have been assumed.

In the aggregate these cost estimates will be lower than those published in ***Addressing Canada's Literacy Challenge: A Market Segmentation Analysis*** which provided estimates of raising all Canadian adults to prose literacy level 3.

Overall, however, the estimated costs of providing remedial instruction to eliminate literacy skill shortages are roughly three times as high as those previously estimated. The current cost estimates were derived by multiplying the estimated number of points that the learner would have to gain at each level by a cost per point for each level. This approach increases the estimated costs at Level 1 where costs per point are roughly 10 times those in Level 2.

**Figure 5.2 A**

**Estimated costs of remedial English instruction by segment, Alberta, 2006**

Comment: Chapter 5 April 26

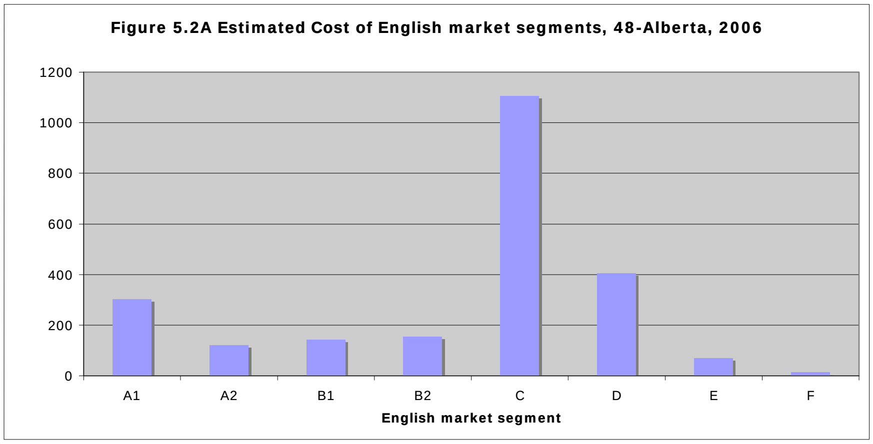
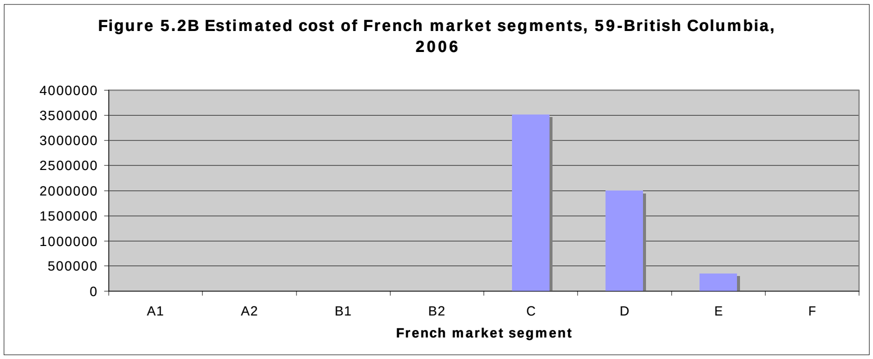



**Figure 5.2 B**

**Estimated costs of remedial French instruction by segment, Alberta, 2006**

Comment: Chapter 5 april 26.xls




The figures reveal several important facts, including that:

The total cost of eliminating literacy skill shortages in Alberta is estimated to be $1.6 billion. This amount reflects the number of learners, the number of literacy points that they are away from the proficiency level demanded by their occupation and cost of providing appropriate types of instruction implied by their segment membership. The overwhelming majority of this cost, $958 million, is associated with providing remedial services to English language learners.

Figures 5.3A and 5.3B plot the relative size of English and French market shares against the market shares based on the cost of providing remedial instruction.

**Figure 5.3A**

**Market shares by cost shares of remedial English instruction, Alberta, 2006**

**Comment:** same

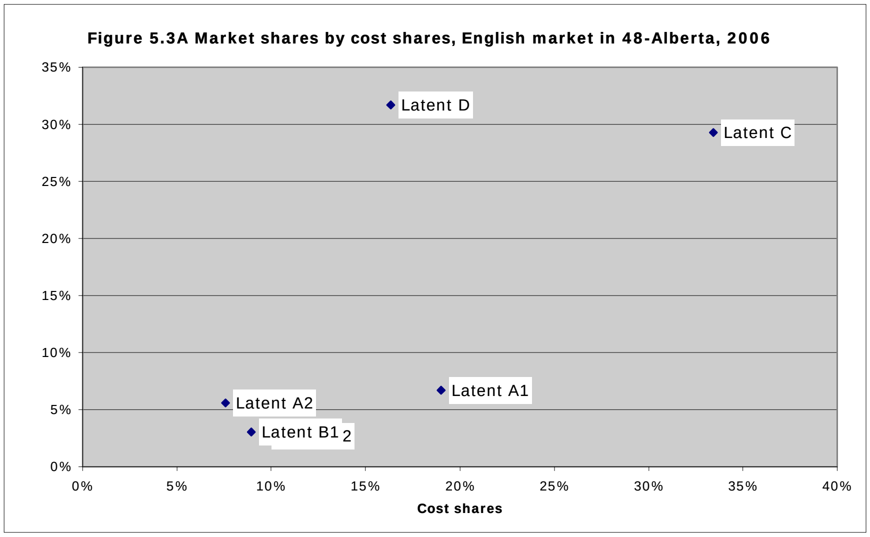



Figure 5.3 A reveals that the English market shares in Alberta are asymmetrically distributed by these measures.

Segment A1, which is dominated by Canadian-born men with less than high school education, represents 7% of the potential English learners in the Alberta literacy market but account for 19% of the estimated remedial costs

Segments C and D represent 61% of the potential English learners in the Alberta literacy account for an estimated 49% of the estimated remedial costs.

**Figure 5.3B**

**Market shares by cost shares of remedial French instruction, Alberta, 2006**

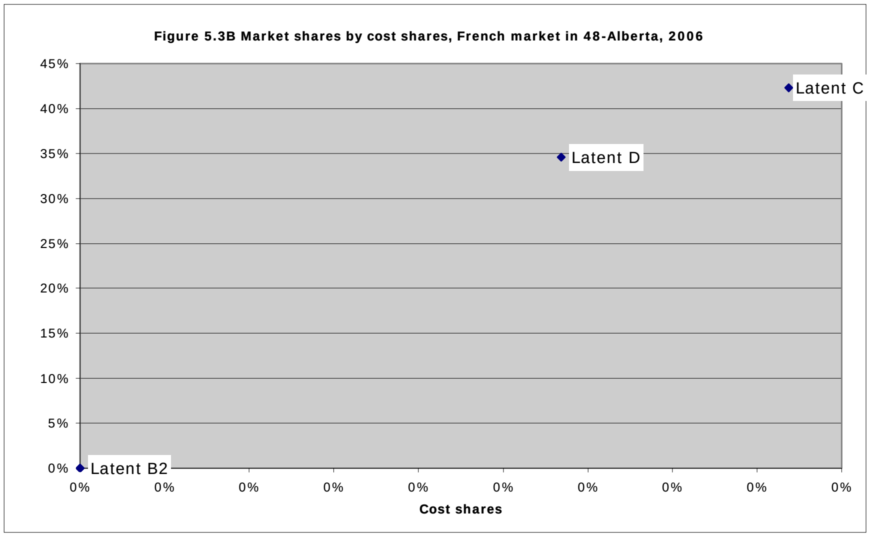



Figure 5.3 B reveals an even greater level of asymmetry in French market shares in Alberta than in the English market but the relationships are quite different.

Segments C and D dominate both the costs and learner shares of the French literacy market in Alberta. Together they represent 100% and 100% of costs and potential learners.

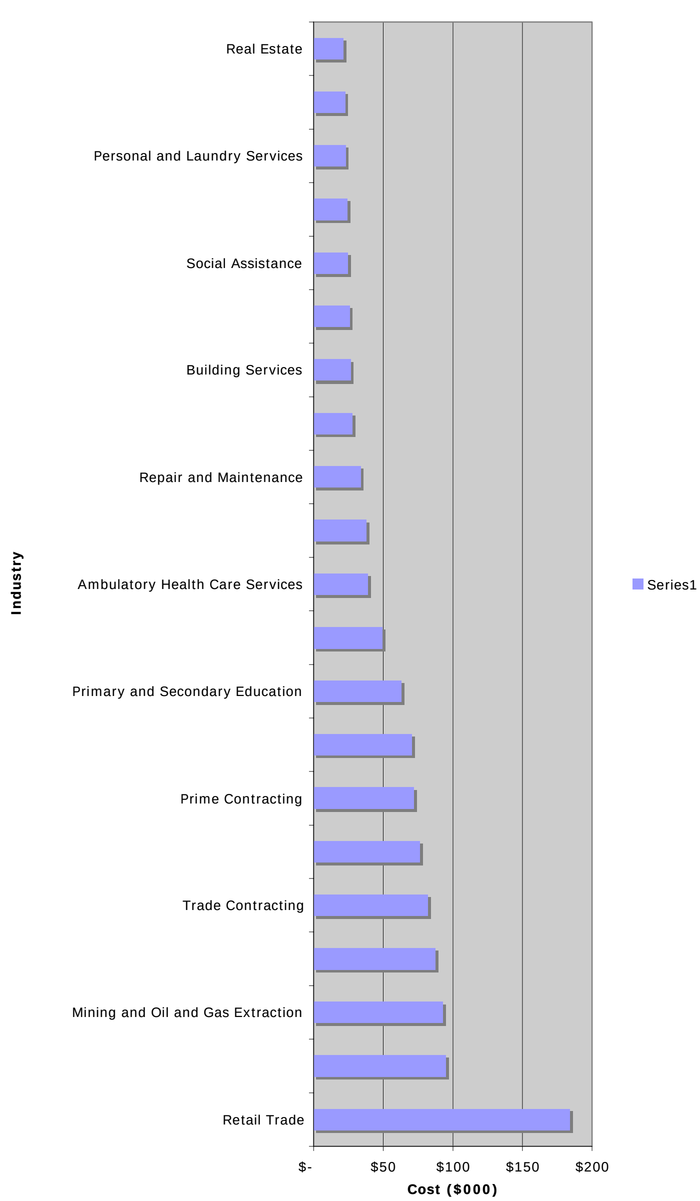
Figures 5.4 and 5.5 extends the analysis of remedial cost to the level of occupation and industry.

Figure 5.4 presents the estimated cost of eliminating literacy skill shortages for those Alberta's industries requiring the largest investments.

**Figure 5.4**

**Estimated cost of eliminating literacy skill deficits, selected industries, Alberta, 2006**

Figure 5.5 Aggregate cost of eliminating literacy skill shortages, selected industries, 48-Alberta, 2006




**Comment:** update to NB For cost benefit Indust 2 April 26

The total cost of eliminating literacy skill shortages by industry is $1.578 billion. Note that the total amount is slightly less than the total estimated cost reported for all workers due to rounding of employment by industry imposed by Statistics Canada to maintain confidentiality.

The chart identifies the 20 Alberta industries that would require the largest investments to eliminate their literacy skill shortages, as follows:

| | Cost of eliminating literacy skill shortages |
|---|---|
| Industry | Millions of dollars |
| Retail Trade | $184 |
| Food Services and Drinking Places | $95 |
| Mining and Oil and Gas Extraction | $93 |
| Transportation | $87 |
| Trade Contracting | $82 |
| Crop Production | $76 |
| Prime Contracting | $72 |
| Wholesale Trade | $71 |
| Primary and Secondary Education | $63 |
| Hospitals | $49 |
| Ambulatory Health Care Services | $39 |
| Architectural, Engineering and Design Services | $38 |
| Repair and Maintenance | $34 |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | $28 |
| Building Services | $27 |
| Food Manufacturing | $26 |
| Social Assistance | $24 |
| Nursing and Residential Care Facilities | $24 |
| Personal and Laundry Services | $23 |
| Federal Government Public Administration (including Defence Services) | $23 |

**Comment:** update list from chart

As noted in Chapter 4 some of these skill shortages could be filled by drawing experienced workers, or adults who are currently out of the labour force, into employment. Overall Canada has a fairly significant literacy skill surplus and the supply of experienced workers is relatively high in many occupations.

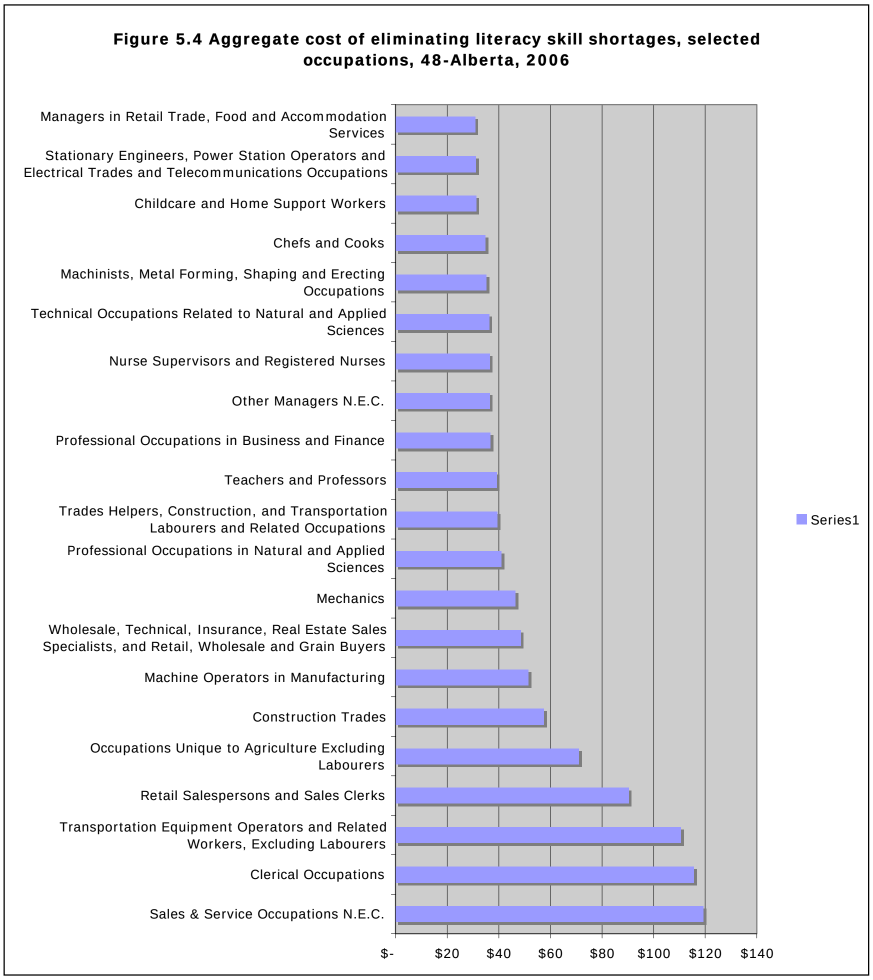
Figure 5.5 identifies the 21 Alberta occupations that would require the largest investment to eliminate their literacy skill shortages:

| Occupation | Cost of eliminating literacy skill shortages<br>Millions of dollars |
|---|---|
| Sales & Service Occupations N.E.C. | $119 |
| Clerical Occupations | $116 |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | $111 |
| Retail Salespersons and Sales Clerks | $90 |
| Occupations Unique to Agriculture Excluding Labourers | $71 |
| Construction Trades | $57 |
| Machine Operators in Manufacturing | $51 |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | $48 |
| Mechanics | $46 |
| Professional Occupations in Natural and Applied Sciences | $41 |
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | $39 |
| Teachers and Professors | $39 |
| Professional Occupations in Business and Finance | $37 |
| Other Managers N.E.C. | $37 |
| Nurse Supervisors and Registered Nurses | $36 |
| Technical Occupations Related to Natural and Applied Sciences | $36 |
| Machinists, Metal Forming, Shaping and Erecting Occupations | $35 |
| Chefs and Cooks | $35 |
| Childcare and Home Support Workers | $31 |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | $31 |

Comment: update list from chart

**Figure 5.5**

**Aggregate cost of eliminating literacy skill shortages, selected occupations, Alberta, 2006**




Comment: For cost benefit by occupaton April 15.xls

## Estimating the benefits of remediation and rates of return on investment

The relationship of literacy scores to individual and macro-economic outcomes suggest that some proportion of the costs of bringing all adult Canadians to the level required by their jobs will be offset by increases in productivity that are passed along to workers in the form of higher incidences of annual employment, more months worked per year, fewer hours worked per month and higher wages.

In previously published analyses two approaches were used to derive first order approximations of the likely economic benefits that would be precipitated by a literacy investment of the proposed magnitude:

Propensity matching to estimate the economic and health benefits at the individual level

Cost-benefit modeling to estimate the net economic benefits at the macro-economic level

The first approach yielded aggregate estimates of the direct economic benefits likely to be precipitated by an increase in literacy skill.

The second approach yielded aggregate estimates of the net economic benefit of an increase in literacy skill that assume the long-term relationship between literacy skill and GDP growth.

The current analysis employs a third approach to estimating the economic benefits of eliminating literacy skill shortages in the Canadian economy.  This approach uses regression analysis to derive an estimate of the additional earnings associated with a one point increase in literacy skill once one has controlled for the predicted literacy level based on an individuals age, gender, immigrant status, aboriginal status, mother tongue and province of residence.

Estimated rates of return on investment are derived by dividing the estimated cost associated with providing the required level of remedial instruction to eliminate the literacy skill deficit by the estimated increase in earnings associated with raising skill the required minimum number of points to close the literacy gap.

The analysis makes the simplifying assumption that literacy skill will be conferred instantaneously and that the labour market will absorb the newly created skill as it is created. True rates of return will depend on how long it takes to impart the necessary skill and the rates at which different industries and occupations are able to absorb the newly created skills.

The total estimated investment needed to eliminate literacy skill shortages in Alberta is $1.6 billion, most of which can be attributed to occupations.

An investment of this magnitude is estimated to generate $9.7 billion in additional earnings per year, an amount the implies an overall annual rate of return on investment of over 500%.

Rates of return vary considerably by industry and occupation.

Figures 5.6 and 5.7 identify the 20 Alberta industries and occupations that appear to yield the highest rates of return.

**Figure 5.6**

**Estimated returns on investment associated with eliminating literacy skill shortages in the employed population, selected industries, Alberta, 2006**

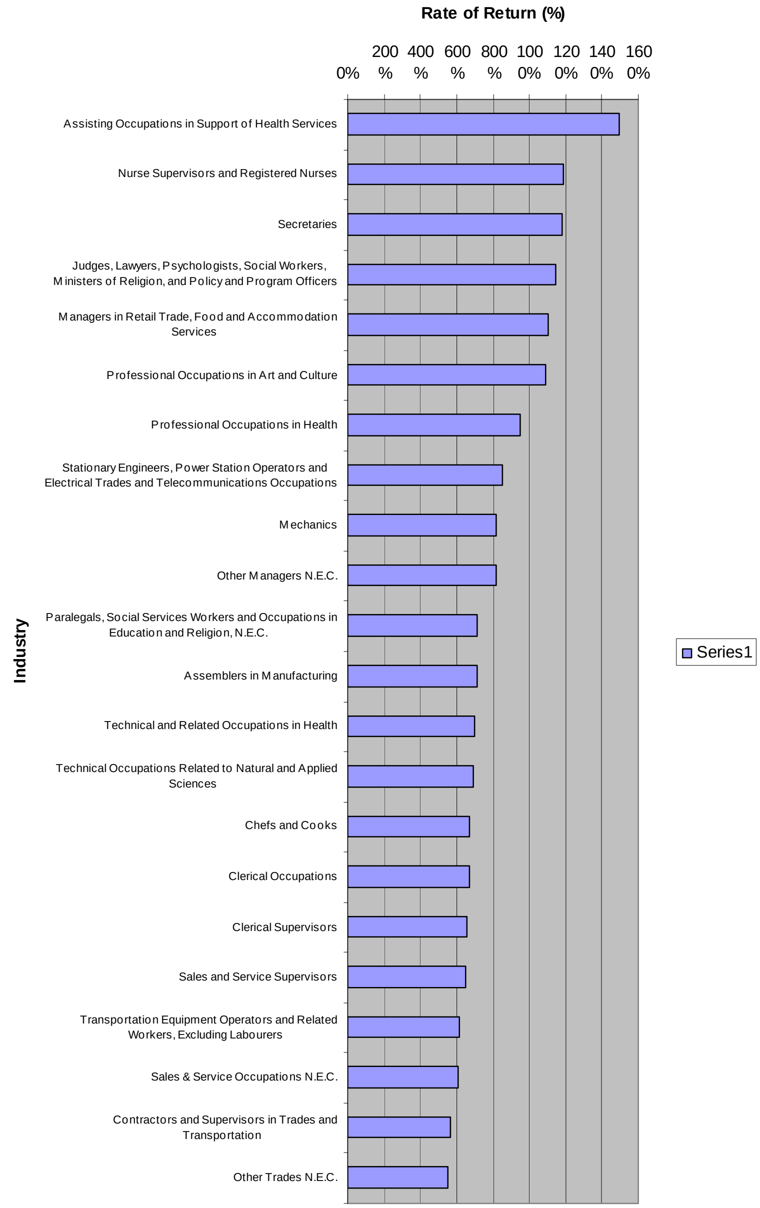
**Comment:** same

**Figure 5.7**

**Estimated returns on investment associated with eliminating literacy skill shortages in the employed population, selected occupations, Alberta, 2006**

**Comment:** same

**Figure 5.5 Rates of return on eliminating literacy skill shortages, Employed, 2006**



The elimination of literacy skill shortages in the following Alberta occupations could yield extraordinary annual rates of returns in the form of increased earnings.

| | Estimated rate of return | | |
|---|---|---|---|
| Occupation | Percentage | | |
| | **Aggreg. Cost $ M** | **Return** | **Rate of Return** |
| Assisting Occupations in Support of Health Services | $ 13 | $ 215 | 1495% |
| Nurse Supervisors and Registered Nurses | $ 14 | $ 184 | 1188% |
| Secretaries | $ 15 | $ 190 | 1183% |
| Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers | $ 14 | $ 169 | 1143% |
| Managers in Retail Trade, Food and Accommodation Services | $ 15 | $ 177 | 1107% |
| Professional Occupations in Art and Culture | $ 11 | $ 125 | 1087% |
| Professional Occupations in Health | $ 12 | $ 126 | 951% |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | $ 17 | $ 163 | 851% |
| Mechanics | $ 40 | $ 366 | 820% |
| Other Managers N.E.C. | $ 20 | $ 179 | 820% |

**Comment:** update list from chart

### Ability to workers to self-finance required level of remedial instruction

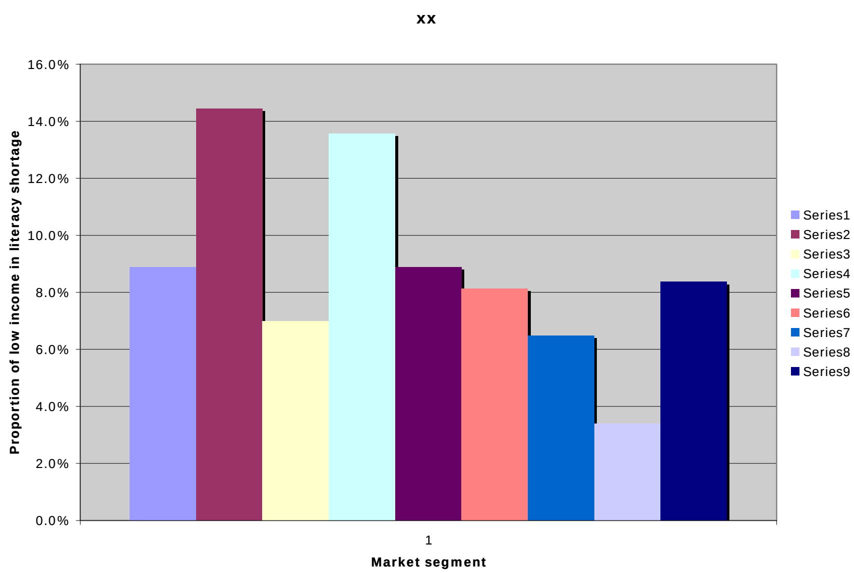
Given that they are the primary beneficiaries of the benefits that would accrue to the elimination of the literacy skill shortages identified in the previous chapter economic theory suggests that it would be best if individuals and/or their employers finance the required investment.

Figures 5.9 identifies the proportions of individuals in literacy shortage who have incomes below Statistics Canada's low income cutoff by English market segment in Alberta.

### Figure 5.9

**Proportion of adults in skill shortage by income status below low income cut-off by English market segment, Alberta, 2006**

**Comment:** I need to talk to Richard about these the data are wrong and my excel won't refresh




The figure reveals that:

| | | | |
|---|---|---|---|
| A1 | 59650 | 5300 | 8.89% |
| A2 | 48850 | 7050 | 14.43% |
| B1 | 25750 | 1800 | 6.99% |
| B2 | 22850 | 3100 | 13.57% |
| C | 271000 | 24050 | 8.87% |
| D | 322500 | 26200 | 8.12% |
| E | 150600 | 9750 | 6.47% |
| F | 38300 | 1300 | 3.39% |
| Total | 939500 | 78550 | 8.36% |

The proportion of low-income adults in Alberta varies considerably by English market segment, from a high of 14% (A2 and B2 – the two segments dominated by immigrants) to a low of 3% (F).

Over all English market segments in Alberta in literacy skill shortage 8% have low incomes, a low enough proportion to suggest that government finance may not be needed to precipitate high enough levels of participation and investment.

The low income French market segments in Alberta are too small to report.

## Chapter 6: Summary and conclusions

This report provides new evidence on the state of Alberta's markets for literacy.

Several important conclusions may be drawn from this evidence.

The labour market demand for literacy skill in Alberta is high and projected to grow rapidly over the coming decade. Recent shifts in the distribution of employment by occupation have, however, served to reduce the level of literacy skill demand.

The supply of literacy skill in Alberta is large but the proportion of workers with literacy skills at Levels 1 and 2 is projected to grow in absolute terms and to remain virtually unchanged in proportional terms.

Unless new sources of literacy supply are tapped literacy skill shortages will grow.

The Alberta economy appears to be relatively inefficient in the sense that it does not make full use of the available supply of literacy skill. The Alberta economy uses 71% of the aggregate supply but current employment demands 97% of the literacy skill possessed by these workers. This represented a huge untapped economic potential and argues for policies to increase the level of literacy skill demand in the Alberta economy, particularly in jobs that currently demand Level 2 literacy skill.

The economic potential of the Alberta economy is also constrained by the fact that an average of 46% of Alberta workers have literacy skill levels below those needed to do their jobs well.

Eliminating literacy skill shortages in Alberta would be expensive - an estimated $1.6 billion would be needed.

Such an investment would, however, generate an estimated $9.7 billion per year in additional earnings an implied one-year return on investment of over 500%.

These benefits would flow from improved productivity associated with less worker error and material wastage, the adoption of more efficient work organization and production methods and lower rates of worker illness and accident.

The simple magnitude of these potential returns justify public investment in literacy despite the fact that most workers have incomes that are sufficiently high to self-finance the required literacy upgrading.

The real case for public literacy investment in Alberta rests, however, on the dire economic consequences associated with trying to compete in fiercely competitive global markets with large numbers of low skilled workers. Individuals and their employers might chose to invest but almost certainly not rapidly enough to avoid a lots of short term economic pain. Faced with large numbers of low-skilled workers Alberta firms will chose to outsource production, will try to reduce labour costs or will simply be unable to compete. So realizing Alberta's full economic potential will depend critically on rapid and massive public investment in adult literacy.

Key findings from each chapter are presented below.

**Comment:** I still need to update the stuff in red

### Chapter 2: The economic demand for literacy skill in Alberta

**The labour market demand for literacy skill in Alberta**

The typical economic demand for prose literacy skill in Canada is relatively high. In total the Canadian economy typically demands an estimated 4.3 billion literacy points, a level that implies an average skill level of 267 points on the 500 point prose literacy scale.

To put the demand in perspective the average skill level of the working age population in Canada in 2006 was estimated to be 273. Thus, Canada has a literacy skill surplus at the aggregate level of roughly 6 points. This difference is equivalent to the additional literacy skill gained through three additional months of education at the mean education level.

Occasionally workers are required to apply a much higher level of skill. The ES profiles suggest that peak demand increases the demand for prose literacy skill by roughly 328 million points to 4.6 billion, an increase of 8%. Peak demand implies a need average prose literacy skill of an estimated 287.5 points. Thus peak demand shifts Canada from a literacy skill surplus to a deficit of an average of 13.5 points, an amount equivalent to roughly 6 months of additional schooling.

There are enormous differences in the level of absolute demand for skill from jurisdiction to jurisdiction. Ontario exhibits by far the largest typical demand for prose literacy skill, with a demand of an estimated 1.6 billion points.

At peak demand levels the Alberta economy generates a demand for 529,220,000 million points, or 12% of the total peak demand in Canada. Thus, the Alberta economy is responsible for a small fraction of the total demand for literacy skill in Canada.

Ontario aggregate peak demand for literacy skill is a staggering 580 times larger than demand in Nunavut and is 1.65 times larger than the level of demand in Quebec, the second largest literacy market in Canada.

Alberta generates the fourth highest level of peak aggregate demand.

Jurisdictions differ in their levels of peak prose literacy skill demand. In most provinces peak aggregate demand exceeds the level of typical demand by typical by 8%.

Alberta aggregate peak demand is 7.4% higher than typical demand.

The average level of literacy skill demand per worker in Alberta is also average. Judged on a per employed worker basis, the Alberta economy demands an average literacy of 287 points at peak demand, 1 point below the national average.

These estimates represent the current minimum level of prose literacy skill demand in Alberta as they are based upon the lower threshold of the literacy levels identified in the Essential Skills Profiles, the minimum needed to satisfy the constraint. Workers might need skills above these levels, something that would serve to raise the implied demand for skill.

Peak skill demand shifts the distribution of employment by proficiency level. At the national level:

The proportion of employment in Level 1 drops to zero – no jobs require skill at this level under complex or peak demand.

The proportion of employment at Level 2 drops by 55% or 2,790,950 jobs.

The proportions of Level 4 jobs climb by 59%.

The proportion of jobs requiring Level 5 jobs rises 1,138,300 jobs, an astounding increase of 460%. This number represents 8.7% of total employment.

The Alberta distribution of proficiency demanded at typical and peak literacy skill levels mirrors the national distribution. Peak demand increases the demand for Level 4 and 5 and reduces the demand for Level 2.

54% of Alberta's peak literacy demand is at Level 3.

At peak demand 15% of Alberta's jobs demand Levels 1 and 2 prose literacy skill and 31% require Levels 4 and 5.

Alberta's industries differ markedly in their distributions of literacy skill demand. Some industry groups demand relatively large proportions of workers with Level 3 or higher skills. Similarly, some industry groups demand relatively small proportions of workers with Level 3 or higher skills.

**How the demand for literacy skill is likely to change**

Projected employment growth at the national level is highly concentrated in occupations that demand higher levels of literacy skill. This finding implies that employers will have difficulty in recruiting employees with the required skill levels unless steps are taken to increase supply.

Projected employment losses at the national level are highly concentrated in occupations that demand low levels of skill. This implies that the available pool of unemployed workers that will be shed by employers will have relatively low skills, well below the level needed by the newly created jobs.

Occupations that are projected to grow the most have an average prose literacy demand level of 3.0 and the occupations that are forecast to grow the least have an average prose literacy skill demand level of 2.7. The 0.3 gap between these two figures suggests that the skill intensity of employment at the national level will rise rapidly between 2006 and 2016. This growth in the literacy intensity of employment at a time when Canada faces a labour shortage suggests that competition among jurisdictions for workers will be fierce.

**The impact of recent changes in employment on the demand for literacy skill in Alberta**

Changes in Alberta's occupational distribution of employment observed between May, 2006 and September, 2008 appear to be even more skill- biased.

Expressed in absolute terms job gains have been concentrated in jobs that demand higher average prose literacy skills and job losses have been concentrated in jobs that require lower average literacy skill. This pattern mirrors that observed in most other jurisdictions but differs from New Brunswick where the skill intensity of employment has been falling sharply. The emergence of a gap of 0.5 in average literacy skill intensity between the fastest and slowest growing occupations in an 18 month period (3.4 v.s. 2.9) suggests that the national COPS projections under-estimate the rate at which the literacy intensity of employment is rising in Alberta.

Expressed as a proportion of 2006 employment job gain appear to be positively skill biased, that is, that the occupations that are growing at the fastest rates demand higher literacy skills.

**Chapter 3: The supply of literacy skill in Alberta**

Jurisdictions differ enormously in the absolute amount of skill available, with Ontario residents possessing over 100 times more skill than PEI.

The supply of literacy skill in Alberta is large with Alberta residents having 10.7% of the total aggregate prose literacy supply in Canada.

The literacy levels of Alberta's employed workers compare favourably to other jurisdictions. Fully 763,760 adults, or 41% of employed workers, possess prose literacy skills at Levels 1 and 2, and 633,362 or 34% have Levels 4 or 5.

An estimated 108,209 Alberta adults in the recently employed labour force, or 46%, have prose literacy skills at Levels 1 and 2. This proportion is slightly more than is evident in the employed population in

Alberta, a fact that suggests that the experienced labour force that is not currently in employment is slightly less skilled than their employed peers.

One measure of economic efficiency is the rate at which the economy utilizes the supply of experienced labour. At 89% Alberta has the highest employed to experienced utilization ratios, a fact that suggests that there is less room for Alberta employers to rely upon drawing new entrants into the labour market as a means to meet rising demand for literacy skill.

**The following 11 occupations have access to the largest stocks of literacy in Alberta:**

| | |
|---|---|
| Clerical Occupations | 52,310,050 |
| Sales & Service Occupations N.E.C. | 33,934,900 |
| Professional Occupations in Natural and Applied Sciences | 24,429,600 |
| Retail Salespersons and Sales Clerks | 21,446,250 |
| Technical Occupations Related to Natural and Applied Sciences | 20,798,800 |
| Teachers and Professors | 20,117,500 |
| Other Managers N.E.C. | 19,855,500 |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | 18,493,750 |
| Construction Trades | 17,437,600 |
| Occupations Unique to Agriculture Excluding Labourers | 16,731,400 |
| Managers in Retail Trade, Food and Accommodation Services | 15,635,000 |

**The following Alberta industries employ high proportions of workers with literacy skills at Levels 1 and 2:**

| | Number | Percent |
|---|---|---|
| Clothing Manufacturing & Leather & Allied Product Manufacturing | 1,800 | 58% |
| Food Manufacturing | 19,050 | 53% |
| Crop Production | 68,550 | 53% |
| Furniture and Related Product Manufacturing | 7,600 | 50% |

**How the supply of prose literacy skill in Alberta is projected to grow to 2016**

The available supply of skill in Alberta will change in response to the following skill flows.

**Skill gain from secondary leavers**

Alberta's 15 year olds compare favourably to other countries or to other Canadian jurisdictions, displaying the highest average scores that among the highest in the world.

**Skill gain through adult education and training**

Canada does not compare favourably by this standard – participation rates are below those attained by other countries and the intensity of training is lower than than observed for many of Canada's trading partners. It is reasonable to assume, therefore, that the flow of skill being added to the supply from this source will be modest.

Alberta compares reasonably well to other jurisdictions in this respect with average hours of training per participant and the participation rate in formal adult education and training during the course of a year above the national average.

**Skill loss**

Over time losses of this magnitude will serve to reduce the available supply of skill. At the national level adults who were 25 or older in 1994 lost an average of 15 points between 1994 and 2003. The chart for Alberta reveals a similar pattern - skill loss is observed over most of the age range during the decade 1994 - 2003. These findings suggests that the demand for literacy skill of Alberta workers is at the level needed to maintain current stocks, a finding that belies the low levels of skill use in some Alberta industries.

### Projected literacy skill distributions

In Alberta the absolute numbers of adults with skills below Level 3 is projected to grow by 181,587 from 1,051,413 to 1,233,000 from 2006 to 2016, or 17%. The Alberta population is forecast to grow by 43% over the same period.

Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 3%.

The absolute number of low skilled adults in Calgary is expected to grow by 91,000 from 317,000 to 408,000.

In Calgary the proportion of adults with Levels 1 and 2 skill is expected to shrink by 1% by 2016.

The absolute number of low skilled adults in Edmonton is expected to grow by 67,000 from 329,000 to 396,000.

In Edmonton the proportion of adults with Levels 1 and 2 skill is expected to shrink by 3% by 2016 from 44% to 41%.

These findings reveal that Alberta cannot rely upon current levels of investment in education and training to meet the rising demand for literacy skill over the medium term. Employers will have greater difficulty in finding workers with the literacy skills they need. Public policy makers must find ways to increase the stock of literacy skill if the economic consequences of literacy skill shortages are to be avoided.

## Chapter 4: Literacy skill utilization, shortages and surpluses in Alberta

At the Canada level an average of only 65 percent of the available labour supply was being used in 2006. The fact that the Alberta economy currently makes use of 71% of the available supply of literacy skill implies that the Alberta economy is the most efficient in Canada at putting the available stock of labour to use. Thus, Alberta would have more difficulty in realizing large GDP gains by making more effective use of the available pool workers.

The Alberta economy demands 97% of the available supply of literacy skill possessed by employed workers. This suggests that the macro-economic performance of the Alberta economy could be improved if the economy made full use of the available supply possessed by these workers.

Together these findings suggest a need for policies and programs that would serve to increase both the supply and the demand for literacy skill in Alberta.

When worker skills are matched to job demands by level Alberta has an aggregate literacy skill surplus of 13,409,350 points, or roughly 20 points per worker.

There is no aggregate shortage for jobs demanding Level 1 prose literacy skills in Alberta because, under peak demand, all jobs require level 2 or above.

The aggregate supply of literacy skill exceeds the peak demand for workers in Level 2 jobs in Alberta. Alberta workers in Level 2 jobs possess 14,359,050 more points of literacy than required under peak demand. This represents an average surplus of 12 literacy points per worker in Level 2 jobs, an amount associated with roughly half a year of education.

The aggregate supply of literacy skill exceeds the peak demand for workers in Level 3 jobs in Alberta. Alberta workers in Level 3 jobs possess 18,945,850 more points of literacy than required under peak demand. This represents an average surplus of 22 literacy points per worker in Level 3 jobs, an amount associated with slightly less than one year of education.

Alberta workers in Level 4 jobs lack a total of -10,611,900 literacy points, an average shortage of 45 points, roughly equal to the literacy skill gain associated with almost two additional years of education.

Alberta workers in Level 5 jobs lack a total of -9,283,650 literacy points, a skill deficit that represents an amount of 68 points per employee, roughly equivalent to the additional literacy normally gained through two and three quarters additional years of education.

Overall 46% of employed Alberta workers are in literacy skill shortage.

The following 18Alberta industries function with 50% or more of their employees with literacy levels below that demanded by their jobs at peak level.

**Percentage with Shortage**

| | Percent with shortage |
|---|---|
| Primary and Secondary Education | 62% |
| Private Households | 62% |
| Legal Services | 61% |
| Hospitals | 56% |
| Accounting and Tax Preparation | 56% |
| Travelling Services | 56% |
| Clothing Manufacturing & Leather & Allied Product Manufacturing | 55% |
| Personal and Laundry Services | 53% |
| Furniture and Related Product Manufacturing | 53% |
| Publishing Industries | 52% |
| Printing and Related Support Activities | 52% |
| Nursing and Residential Care Facilities | 51% |
| Trade Contracting | 51% |
| Electrical Equipment, Appliance and Component Manufacturing | 51% |
| Textile Mills & Textile Product Mills | 51% |
| Machinery Manufacturing | 51% |
| Fabricated Metal Product Manufacturing | 50% |

**The following 20 Alberta industries employee the largest numbers of workers with literacy skills below the level demanded at peak demand**

| | Number |
|---|---|
| Retail Trade | 91,941 |
| Mining and Oil and Gas Extraction | 50,483 |
| Primary and Secondary Education | 44,833 |
| Transportation | 43,829 |
| Trade Contracting | 41,415 |
| Wholesale Trade | 38,432 |
| Food Services and Drinking Places | 38,352 |
| Prime Contracting | 35,294 |
| Hospitals | 31,898 |
| Crop Production | 27,036 |
| Architectural, Engineering and Design Services | 25,824 |
| Ambulatory Health Care Services | 25,790 |
| Repair and Maintenance | 17,901 |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | 15,656 |
| Social Assistance | 14,716 |
| Nursing and Residential Care Facilities | 14,252 |
| Federal Government Public Administration (including Defence Services) | 13,290 |
| Personal and Laundry Services | 13,081 |
| Provincial and Territorial Public Administration | 11,989 |
| Real Estate | 11,373 |

**50% or more of workers in the following Alberta occupations have literacy skills below that level demanded by their jobs at peak demand**

| | Percent |
|---|---|
| Nurse Supervisors and Registered Nurses | 81% |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | 70% |
| Retail Salespersons and Sales Clerks | 69% |
| Professional Occupations in Business and Finance | 65% |
| Contractors and Supervisors in Trades and Transportation | 65% |
| Other Trades N.E.C. | 64% |
| Childcare and Home Support Workers | 63% |
| Assemblers in Manufacturing | 60% |
| Teachers and Professors | 56% |
| Technical and Related Occupations in Health | 55% |
| Supervisors in Manufacturing | 54% |
| Occupations in Protective Services | 54% |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | 52% |
| Professional Occupations in Art and Culture | 52% |
| Professional Occupations in Health | 51% |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | 50% |
| Professional Occupations in Natural and Applied Sciences | 50% |

**The following 10 occupations employ the largest numbers of workers with literacy skills below the level required by their jobs at peak demand**

| | Number with shortage |
|---|---|
| Clerical Occupations | 76,026 |
| Retail Salespersons and Sales Clerks | 52,015 |
| Sales & Service Occupations N.E.C. | 46,413 |
| Professional Occupations in Natural and Applied Sciences | 37,511 |
| Teachers and Professors | 34,920 |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | 33,490 |
| Professional Occupations in Business and Finance | 30,081 |
| Construction Trades | 29,956 |
| Technical Occupations Related to Natural and Applied Sciences | 28,521 |
| Nurse Supervisors and Registered Nurses | 25,275 |

**The social dimension of skill surpluses and shortages in Alberta**

Men and women in Alberta face roughly the same level of risk of being in skill shortage. Roughly half of both groups have prose literacy skills than are notionally required by their occupation under peak demand conditions 48% v.s. 45%.

Women have a higher probability of being in skill surplus, a fact that can be attributed to the fact that, as a group, women have higher average literacy skill levels. 32% of employed women in Alberta have surplus literacy skills v.s. 29% for men.

Immigrants in Alberta face a 16% higher risk of being in skill shortage than their non-immigrant peers. 59% of immigrants in the experienced labour force are in skill shortage compared to 43% of their non-immigrant peers.

Literacy skill shortages in the Alberta employed population are high for all age groups, ranging from a low of 40% to a high of 59%.

The rate of skill shortage rises steadily with age, a fact that largely mirrors the underlying relationship of literacy skill to educational attainment.

Employed youth aged 16 to 24 face the lowest level of risk of being in shortage but over a third of this group (40%) are judged to be in shortage.

Employed seniors aged 65 years of age and over face the highest risks of being in literacy skill shortage (59%). This finding suggests that the seniors who remain in the labour force have a very high probability of having low skills.

A large proportion, 44%, of employed aboriginal adults in Alberta are in skill shortage.

Employed Aboriginal adults in Alberta face a slightly lower risk of being in skill shortage than their non-Aboriginal peers – 44% v.s. 46%.

Non-official language adults face much higher levels of risk of being in literacy skill shortage than their official language peers. For example, 60% of these "other language" adults in the employed labour force are in skill shortage v.s. 43% of their English-speaking peers.

Without adjustment for differences in background characteristics Albertan workers are more likely than their peers in British Columbia and Saskatchewan to be in literacy skill shortage but are less likely than workers in other provinces.

With adjustment Albertan workers are 16% more likely to be in literacy skill shortage than the reference group of multi-lingual B.C. workers aged 65 and over with a degree.

## Chapter 5: What would be required to overcome current literacy skill shortages in Alberta

### Size of market segments

The literacy market in Alberta, defined by the number of employed workers that do not possess the level of literacy required by their occupation, includes 959,000 potential learners.

The English language literacy market in Alberta includes the following market segments:

Table 5.1 Market shares by cost shares, English market in 48-Alberta, 2006

| Language and market segment | Number of potential learners | **Cost of remedial instruction ($M)** | **Share of cost by market segment** | **Proportion of literacy shortage by market segment** |
|---|---|---|---|---|
| **English** | | | | |
| Latent A1 | 64,250 | $303 | 19% | 7% |
| Latent A2 | 53,650 | $121 | 8% | 6% |
| Latent B1 | 29,050 | $143 | 9% | 3% |
| Latent B2 | 25,550 | $154 | 10% | 3% |
| Latent C | 280,750 | $534 | 33% | 29% |
| Latent D | 303,750 | $261 | 16% | 32% |
| Latent E | 161,500 | $68 | 4% | 17% |
| Latent F | 39,800 | $13 | 1% | 4% |
| | 958,300 | $1,597 | | |

The French language literacy market in Alberta includes the following market segments:

| | | | | |
|---|---|---|---|---|
| **French** | - | | | |
| Latent A1 | - | $- | 0% | 0% |
| Latent A2 | - | $- | 0% | 0% |
| Latent B1 | - | $- | 0% | 0% |
| Latent B2 | 550 | $- | 0% | 0% |
| Latent C | 450 | $1 | 0% | 42% |
| Latent D | 300 | $1 | 0% | 35% |
| Latent E | - | $0 | 0% | 23% |
| Latent F | | $- | 0% | 0% |
| | 1300 | $2 | | |

53% of workers in English literacy skill shortage in Alberta are classified in literacy market segments D, E and F. These learners display no evidence of weakness in the mechanics of reading i.e. they have adequate decoding and comprehension skills.

47% of workers in English literacy skill shortage in Alberta have discernible weakness in their decoding and comprehension skill.

9% of the English literacy market in Alberta is classified in market segments A2 and B2, the two classes dominated by immigrant women.

### Estimated cost of eliminating literacy shortages

An investment of $1.6 billion would be required to eliminate literacy skill shortages in the Alberta economy.

The English market shares in Alberta are asymmetrically distributed by remedial cost and market share.

Segment A1, which is dominated by Canadian-born men with less than high school education, represents 7% of the potential English learners in the Alberta literacy market but account for 19% of the estimated remedial costs

Segments C and D represent 61% of the potential English learners in the Alberta literacy account for an estimated 49% of the estimated remedial costs.

The following occupations in Alberta would require the largest investments:

| | |
|---|---|
| Sales & Service Occupations N.E.C. | $119 |
| Clerical Occupations | $116 |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | $111 |
| Retail Salespersons and Sales Clerks | $90 |
| Occupations Unique to Agriculture Excluding Labourers | $71 |
| Construction Trades | $57 |
| Machine Operators in Manufacturing | $51 |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | $48 |

| | |
|---|---|
| Mechanics | $46 |
| Professional Occupations in Natural and Applied Sciences | $41 |
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | $39 |
| Teachers and Professors | $39 |
| Professional Occupations in Business and Finance | $37 |
| Other Managers N.E.C. | $37 |
| Nurse Supervisors and Registered Nurses | $36 |
| Technical Occupations Related to Natural and Applied Sciences | $36 |
| Machinists, Metal Forming, Shaping and Erecting Occupations | $35 |
| Chefs and Cooks | $35 |
| Childcare and Home Support Workers | $31 |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | $31 |

The following 10 Alberta industries would require the largest investments:

| | |
|---|---|
| Retail Trade | $184 |
| Food Services and Drinking Places | $95 |
| Mining and Oil and Gas Extraction | $93 |
| Transportation | $87 |
| Trade Contracting | $82 |
| Crop Production | $76 |
| Prime Contracting | $72 |
| Wholesale Trade | $71 |
| Primary and Secondary Education | $63 |
| Hospitals | $49 |
| Ambulatory Health Care Services | $39 |
| Architectural, Engineering and Design Services | $38 |
| Repair and Maintenance | $34 |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | $28 |
| Building Services | $27 |
| Food Manufacturing | $26 |
| Social Assistance | $24 |
| Nursing and Residential Care Facilities | $24 |
| Personal and Laundry Services | $23 |
| Federal Government Public Administration (including Defence Services) | $23 |

### The benefits of remediation and rates of return on investment

Were the Alberta economy able to absorb all of the newly created literacy skill and put it to good use then a $1.6 billion investment would precipitate a $9.7 billion increase in the earnings of employed Alberta workers. This increase represents an average rate of return on investment of over 500%.

Rates of return vary considerably by industry and occupation.

**Ability to workers to self-finance required level of remedial instruction**

The proportion of low-income adults in Alberta varies considerably by English market segment, from a high of 14% (A2 and B2 – the two segments dominated by immigrants) to a low of 3% (F).

Over all English market segments in Alberta in literacy skill shortage 8% have low incomes, a low enough proportion to suggest that government finance may not be needed to precipitate high enough levels of participation and investment.

The low income French market segments in Alberta are too small to report.

## Annex A: Statistical tables

### Table 2.1

**The implied aggregate economic demand for prose literacy skills, adults aged 16 and over, Canada and the jurisdictions, 2006**

| | Aggregate demand for literacy skills based on occupations of employment, 2006 | | |
|---|---|---|---|
| | Total employment | Typical skills demanded | Complex skills demanded |
| **Canada** | **15,934,350** | **4,252,975,400** | **4,581,107,500** |
| Newfoundland | 202,100 | 53,935,950 | 57,986,250 |
| Prince Edward Island | 66,350 | 17,491,250 | 18,833,750 |
| Nova Scotia | 431,150 | 114,670,100 | 123,566,250 |
| New Brunswick | 343,050 | 90,763,250 | 97,932,500 |
| Quebec | 3,722,450 | 994,176,300 | 1,070,981,250 |
| **Ontario** | **6,129,900** | **1,639,736,200** | **1,767,883,750** |
| Manitoba | 573,800 | 151,760,200 | 164,283,750 |
| Saskatchewan | 491,250 | 128,623,600 | 138,558,750 |
| Alberta | 1,844,150 | 492,735,900 | 529,220,000 |
| British Columbia | 2,081,100 | 555,891,100 | 597,737,500 |
| Yukon | 17,200 | 4,663,800 | 4,946,250 |
| North West Territories | 21,150 | 5,703,800 | 6,113,750 |
| Nunavut | 10,550 | 2,865,000 | 3,047,500 |

**Source:** HRSDC Essential Skills Profiles, 2008 and the 2006 Census of Population.

### Table 2.2

**The implied aggregate economic demand for prose literacy skill by province and territory, 2006**

| Aggregate demand for prose literacy (in points) | | | |
|---|---|---|---|
| | Typical literacy demand | Complex literacy demand | Percent increase from typical to complex demand |
| **Canada** | **4,252,975,400** | **4,581,107,500** | **7.7** |
| Newfoundland | 53,935,950 | 57,986,250 | 7.5 |
| Prince Edward Island | 17,491,250 | 18,833,750 | 7.7 |
| Nova Scotia | 114,670,100 | 123,566,250 | 7.8 |
| New Brunswick | 90,763,250 | 97,932,500 | 7.9 |
| Quebec | 994,176,300 | 1,070,981,250 | 7.7 |
| **Ontario** | **1,639,736,200** | **1,767,883,750** | **7.8** |
| Manitoba | 151,760,200 | 164,283,750 | 8.3 |
| Saskatchewan | 128,623,600 | 138,558,750 | 7.7 |
| Alberta | 492,735,900 | 529,220,000 | 7.4 |
| British Columbia | 555,891,100 | 597,737,500 | 7.5 |
| Yukon | 4,663,800 | 4,946,250 | 6.1 |
| North West Territories | 5,703,800 | 6,113,750 | 7.2 |
| Nunavut | 2,865,000 | 3,047,500 | 6.4 |

**Source:** HRSDC Essential Skills Profiles 2008 and the 2006 Census of Population.

**Table 2.3**

**The implied economic demand for prose literacy skill by province and territory, per worker, 2006**

| Jurisdiction | Employment | Typical average literacy demand per worker | Complex average literacy demand per worker |
|---|---|---|---|
| **Canada** | **15,934,350** | | |
| Newfoundland and Labrador | 202,100 | 267 | 287 |
| Prince Edward Island | 66,350 | 264 | 284 |
| Nova Scotia | 431,150 | 266 | 287 |
| New Brunswick | 343,050 | 265 | 285 |
| Quebec | 3,722,450 | 267 | 288 |
| **Ontario** | **6,129,900** | **267** | **288** |
| Manitoba | 573,800 | 264 | 286 |
| Saskatchewan | 491,250 | 262 | 282 |
| Alberta | 1,844,150 | 267 | 287 |
| British Columbia | 2,081,100 | 267 | 287 |

| | | | |
|---|---|---|---|
| Yukon | 17,200 | 271 | 288 |
| North West Territories | 21,150 | 270 | 289 |
| Nunavut | 10,550 | 272 | 289 |

**Source:** HRSDC Essential Skills Profiles 2008 and the 2006 Census of Population.

**Table 2.4**

**The distribution of employment and aggregate literacy skill demand by proficiency level, typical and complex, Canada and the jurisdiction, 2006**

| Jurisdiction | Typical total aggregate literacy demand (in '000 points) | Typical total aggregate literacy demand by prose proficiency level (in 000 points) Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|---|---|---|---|---|
| **Canada** | **4,292,086** | **39,150** | **1,133,235** | **2,319,350** | **707,558** | **92,794** |
| Newfoundland and Labrador | 54,885 | 950 | 13,770 | 30,126 | 8,970 | 1,069 |
| Prince Edward Island | 17,491 | - | 5,400 | 9,226 | 2,584 | 281 |
| Nova Scotia | 116,019 | 1,350 | 30,983 | 63,470 | 17,891 | 2,325 |
| New Brunswick | 91,513 | 750 | 26,753 | 48,496 | 13,845 | 1,669 |
| Quebec | 1,004,216 | 10,050 | 260,246 | 548,171 | 163,605 | 22,144 |
| Ontario | 1,653,423 | 13,700 | 430,054 | 888,814 | 285,643 | 35,213 |
| Manitoba | 153,209 | 1,450 | 45,405 | 79,296 | 24,489 | 2,569 |
| Saskatchewan | 129,723 | 1,100 | 43,976 | 62,796 | 19,825 | 2,025 |
| Alberta | 497,381 | 4,650 | 129,465 | 270,559 | 80,633 | 12,075 |
| British Columbia | 560,736 | 4,850 | 144,236 | 310,929 | 87,653 | 13,069 |
| Yukon | 4,714 | 50 | 968 | 2,736 | 829 | 131 |
| North West Territories | 5,754 | 50 | 1,283 | 3,231 | 1,040 | 150 |
| Nunavut | 2,865 | - | 709 | 1,526 | 536 | 94 |

| Jurisdiction | Distribution of employment at typical demand | Proficiency level Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|---|---|---|---|---|
| **Canada** | **15,934,300** | **39,150** | **5,036,600** | **8,434,000** | **2,177,100** | **247,450** |
| Newfoundland and Labrador | 202,150 | 950 | 61,200 | 109,550 | 27,600 | 2,850 |
| Prince Edward Island | 66,250 | - | 24,000 | 33,550 | 7,950 | 750 |
| Nova Scotia | 431,100 | 1,350 | 137,700 | 230,800 | 55,050 | 6,200 |
| New Brunswick | 343,050 | 750 | 118,900 | 176,350 | 42,600 | 4,450 |
| Quebec | 3,722,500 | 10,050 | 1,156,650 | 1,993,350 | 503,400 | 59,050 |
| Ontario | 6,129,900 | 13,700 | 1,911,350 | 3,232,050 | 878,900 | 93,900 |
| Manitoba | 573,800 | 1,450 | 201,800 | 288,350 | 75,350 | 6,850 |
| Saskatchewan | 491,300 | 1,100 | 195,450 | 228,350 | 61,000 | 5,400 |
| Alberta | 1,844,200 | 4,650 | 575,400 | 983,850 | 248,100 | 32,200 |
| British Columbia | 2,081,100 | 4,850 | 641,050 | 1,130,650 | 269,700 | 34,850 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Yukon | 17,200 | 50 | 4,300 | 9,950 | 2,550 | 350 |
| North West Territories | 21,100 | 50 | 5,700 | 11,750 | 3,200 | 400 |
| Nunavut | 10,600 | - | 3,150 | 5,550 | 1,650 | 250 |

| Jurisdiction | **Distribution of employment at typical demand (percentage)** | **Proficiency level** Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|---|---|---|---|---|
| **Canada** | **100** | **0** | **32** | **53** | **14** | **2** |
| Newfoundland and Labrador | 100 | 0 | 30 | 54 | 14 | 1 |
| Prince Edward Island | 100 | 0 | 36 | 51 | 12 | 1 |
| Nova Scotia | 100 | 0 | 32 | 54 | 13 | 1 |
| New Brunswick | 100 | 0 | 35 | 51 | 12 | 1 |
| Quebec | 100 | 0 | 31 | 54 | 14 | 2 |
| Ontario | 100 | 0 | 31 | 53 | 14 | 2 |
| Manitoba | 100 | 0 | 35 | 50 | 13 | 1 |
| Saskatchewan | 100 | 0 | 40 | 46 | 12 | 1 |
| Alberta | 100 | 0 | 31 | 53 | 13 | 2 |
| British Columbia | 100 | 0 | 31 | 54 | 13 | 2 |
| Yukon | 100 | 0 | 25 | 58 | 15 | 2 |
| North West Territories | 100 | 0 | 27 | 56 | 15 | 2 |
| Nunavut | 100 | 0 | 30 | 52 | 16 | 2 |
| **Canada** | **4,581,108** | **-** | **505,271** | **2,432,623** | **1,123,558** | **519,656** |
| Newfoundland and Labrador | 57,986 | - | 6,761 | 31,103 | 12,773 | 7,350 |
| Prince Edward Island | 18,834 | - | 2,633 | 10,106 | 4,014 | 2,081 |
| Nova Scotia | 123,566 | - | 14,074 | 66,921 | 28,584 | 13,988 |
| New Brunswick | 97,933 | - | 12,274 | 52,594 | 22,003 | 11,063 |
| Quebec | 1,070,981 | - | 114,908 | 573,925 | 257,855 | 124,294 |
| Ontario | 1,767,884 | - | 179,820 | 942,769 | 442,926 | 202,369 |
| Manitoba | 164,284 | - | 20,475 | 85,841 | 39,293 | 18,675 |
| Saskatchewan | 138,559 | - | 23,636 | 69,204 | 30,794 | 14,925 |
| Alberta | 529,220 | - | 63,349 | 274,216 | 132,649 | 59,006 |
| British Columbia | 597,738 | - | 65,790 | 318,533 | 149,403 | 64,013 |
| Yukon | 4,946 | - | 506 | 2,668 | 1,154 | 619 |
| North West Territories | 6,114 | - | 630 | 3,231 | 1,446 | 806 |
| Nunavut | 3,048 | - | 416 | 1,513 | 650 | 469 |

| Jurisdiction | **Distribution of employment at complex demand** | **Proficiency level** Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|---|---|---|---|---|
| **Canada** | **15,934,400** | **-** | **2,245,650** | **8,845,900** | **3,457,100** | **1,385,750** |
| Newfoundland and Labrador | 202,050 | - | 30,050 | 113,100 | 39,300 | 19,600 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Prince Edward Island | 66,350 | - | 11,700 | 36,750 | 12,350 | 5,550 |
| Nova Scotia | 431,150 | - | 62,550 | 243,350 | 87,950 | 37,300 |
| New Brunswick | 343,000 | - | 54,550 | 191,250 | 67,700 | 29,500 |
| Quebec | 3,722,550 | - | 510,700 | 2,087,000 | 793,400 | 331,450 |
| Ontario | 6,129,950 | - | 799,200 | 3,428,250 | 1,362,850 | 539,650 |
| Manitoba | 573,850 | - | 91,000 | 312,150 | 120,900 | 49,800 |
| Saskatchewan | 491,250 | - | 105,050 | 251,650 | 94,750 | 39,800 |
| Alberta | 1,844,200 | - | 281,550 | 997,150 | 408,150 | 157,350 |
| British Columbia | 2,081,100 | - | 292,400 | 1,158,300 | 459,700 | 170,700 |
| Yukon | 17,150 | - | 2,250 | 9,700 | 3,550 | 1,650 |
| North West Territories | 21,150 | - | 2,800 | 11,750 | 4,450 | 2,150 |
| Nunavut | 10,600 | - | 1,850 | 5,500 | 2,000 | 1,250 |

| | **Distribution of employment** | **Proficiency level** | | | | |
|---|---|---|---|---|---|---|
| Jurisdiction | **(percentage)** | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| **Canada** | **100** | **0** | **14** | **56** | **22** | **9** |
| Newfoundland and Labrador | 100 | 0 | 15 | 56 | 19 | 10 |
| Prince Edward Island | 100 | 0 | 18 | 55 | 19 | 8 |
| Nova Scotia | 100 | 0 | 15 | 56 | 20 | 9 |
| New Brunswick | 100 | 0 | 16 | 56 | 20 | 9 |
| Quebec | 100 | 0 | 14 | 56 | 21 | 9 |
| Ontario | 100 | 0 | 13 | 56 | 22 | 9 |
| Manitoba | 100 | 0 | 16 | 54 | 21 | 9 |
| Saskatchewan | 100 | 0 | 21 | 51 | 19 | 8 |
| Alberta | 100 | 0 | 15 | 54 | 22 | 9 |
| British Columbia | 100 | 0 | 14 | 56 | 22 | 8 |
| Yukon | 100 | 0 | 13 | 57 | 21 | 10 |
| North West Territories | 100 | 0 | 13 | 56 | 21 | 10 |
| Nunavut | 100 | 0 | 17 | 52 | 19 | 12 |

**Table 2.5**

**Employment levels and proportion by level of demand at the complex level by jurisdiction, 2006**

| | **Lower bound of proficiency level** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Jurisdiction | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Total employment 2006 | Total | Average level of complex demand per worker |
| **Canada** | **-** | **2,245,650** | **8,845,900** | **3,457,100** | **1,385,700** | **15,934,350** | **4,581,088,750** | **287** |
| Newfoundland and Labrador | - | 30,050 | 113,100 | 39,300 | 19,650 | 202,100 | 58,005,000 | 287 |
| Prince Edward Island | - | 11,700 | 36,800 | 12,350 | 5,550 | 66,300 | 18,847,500 | 284 |
| Nova Scotia | - | 62,550 | 243,350 | 88,000 | 37,250 | 431,150 | 123,563,750 | 287 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| New Brunswick | - | 54,550 | 191,250 | 67,700 | 29,500 | 343,050 | 97,932,500 | 285 |
| Quebec | - | 510,650 | 2,087,000 | 793,400 | 331,450 | 3,722,500 | 1,070,970,000 | 288 |
| Ontario | - | 799,150 | 3,428,250 | 1,362,850 | 539,700 | 6,129,950 | 1,767,891,250 | 288 |
| Manitoba | - | 91,000 | 312,150 | 120,900 | 49,800 | 573,850 | 164,283,750 | 286 |
| Saskatchewan | - | 105,050 | 251,650 | 94,750 | 39,800 | 491,250 | 138,558,750 | 282 |
| Alberta | - | 281,550 | 997,100 | 408,150 | 157,400 | 1,844,200 | 529,225,000 | 287 |
| British Columbia | - | 292,400 | 1,158,300 | 459,750 | 170,700 | 2,081,100 | 597,753,750 | 287 |
| Yukon | - | 2,300 | 9,650 | 3,600 | 1,700 | 17,200 | 4,978,750 | 289 |
| North West Territories | - | 2,850 | 11,750 | 4,450 | 2,100 | 21,150 | 6,106,250 | 289 |
| Nunavut | - | 1,850 | 5,500 | 2,000 | 1,250 | 10,600 | 3,047,500 | 288 |

| | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Total | Levels 1/2 | Levels 4/5 |
|---|---|---|---|---|---|---|---|---|
| **Canada** | **0** | **14** | **56** | **22** | **9** | **100** | **14** | **30** |
| Newfoundland and Labrador | 0 | 15 | 56 | 19 | 10 | 100 | 15 | 29 |
| Prince Edward Island | 0 | 18 | 55 | 19 | 8 | 100 | 18 | 27 |
| Nova Scotia | 0 | 15 | 56 | 20 | 9 | 100 | 15 | 29 |
| New Brunswick | 0 | 16 | 56 | 20 | 9 | 100 | 16 | 28 |
| Quebec | 0 | 14 | 56 | 21 | 9 | 100 | 14 | 30 |
| Ontario | 0 | 13 | 56 | 22 | 9 | 100 | 13 | 31 |
| Manitoba | 0 | 16 | 54 | 21 | 9 | 100 | 16 | 30 |
| Saskatchewan | 0 | 21 | 51 | 19 | 8 | 100 | 21 | 27 |
| Alberta | 0 | 15 | 54 | 22 | 9 | 100 | 15 | 31 |
| British Columbia | 0 | 14 | 56 | 22 | 8 | 100 | 14 | 30 |
| Yukon | 0 | 13 | 56 | 21 | 10 | 100 | 13 | 31 |
| North West Territories | 0 | 13 | 56 | 21 | 10 | 100 | 13 | 31 |
| Nunavut | 0 | 18 | 52 | 19 | 12 | 100 | 18 | 31 |

**Table 2.7**

**Proportion of the employed labour force by skill Level below prose literacy Level 3, Alberta, 2006**

| | Proficiency level | | | | |
|---|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| Occupational skill level | Percentage | | | | |
| Level A | - | 0 | 29 | 23 | 48 |
| Level B | - | 14 | 56 | 27 | 3 |
| Level C | - | 2 | 65 | 33 | 0 |
| Level D | - | 83 | 17 | 0 | 0 |
| **Total employment** | **-** | **16** | **50** | **25** | **10** |

**Table 2.8**

**Employed labour force by prose literacy skill demand level, Alberta, 2006**

| | Proficiency level | | | | |
|---|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| | Employment | | | | |
| Level A | - | - | 79,850 | 65050 | 135,150 |
| Level B | - | 85,700 | 348,650 | 165,350 | 21,100 |
| Level C | - | 12,000 | 354,100 | 177,750 | 1150 |
| Level D | | 12,000 | 34,850 | - | 730,750 |
| Total employment | - | 265,700 | 817,450 | 408,150 | 157,400 |

**Table 2.9**

**Proportion of total employment by literacy skill demand level, industries, Alberta, 2006**

| | Essential Skill Needs - Complex | | | | | |
|---|---|---|---|---|---|---|
| | Total | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| | Percentage | | | | | |
| **All Industries** | 100% | 0% | 15% | | | |
| **Legal Services** | **100%** | **0%** | **0%** | | | |
| **Primary and Secondary Education** | **100%** | **0%** | **6%** | | | |
| **Accounting and Tax Preparation** | **100%** | **0%** | **1%** | | | |
| **Hospitals** | **100%** | **0%** | **5%** | | | |
| **Architectural, Engineering and Design Services** | **100%** | **0%** | **4%** | | | |
| **Publishing Industries** | **100%** | **0%** | **4%** | | | |
| **Travelling Services** | **100%** | **0%** | **3%** | | | |
| **Provincial and Territorial Public Administration** | **100%** | **0%** | **3%** | | | |
| **Computer System Design Services** | **100%** | **0%** | **1%** | | | |
| **Federal Government Public Administration (including Defence Services)** | **100%** | **0%** | **2%** | | | |
| **Ambulatory Health Care Services** | **100%** | **0%** | **1%** | | | |
| **Management, Scientific and Technical Services** | **100%** | **0%** | **5%** | | | |
| **Computer and Electronic Product Manufacturing** | **100%** | **0%** | **4%** | | | |
| **Other Professional Services** | **100%** | **0%** | **4%** | | | |
| **Utilities** | **100%** | **0%** | **10%** | | | |
| **Private Households** | **100%** | **0%** | **19%** | | | |
| **Electrical Equipment, Appliance and Component Manufacturing** | **100%** | **0%** | **8%** | | | |
| **Information Services and Data Processing Services** | **100%** | **0%** | **5%** | | | |
| **Social Assistance** | **100%** | **0%** | **2%** | | | |
| **Nursing and Residential Care Facilities** | **100%** | **0%** | **8%** | | | |
| **Chemical Manufacturing** | **100%** | **0%** | **14%** | | | |
| **Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other** | **100%** | **0%** | **16%** | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Extra-Territorial Public Admin** | | | | | | |
| **Personal and Laundry Services** | **100%** | **0%** | **14%** | | | |
| **Advertising and Related Services** | **100%** | **0%** | **8%** | | | |
| **Machinery Manufacturing** | **100%** | **0%** | **6%** | | | |
| **Other Schools and Educational Support** | **100%** | **0%** | **1%** | | | |
| **Heritage Institutions** | **100%** | **0%** | **19%** | | | |
| **Broadcasting and Telecommunications** | **100%** | **0%** | **2%** | | | |
| **Petroleum and Coal Products Manufacturing** | **100%** | **0%** | **20%** | | | |
| **Printing and Related Support Activities** | **100%** | **0%** | **10%** | | | |
| **Wholesale Trade** | **100%** | **0%** | **6%** | | | |
| **Religious, Grant-Making, Civic, and Professional and Similar Organizations** | **100%** | **0%** | **8%** | | | |
| **Management of Enterprises and Other Administrative Services** | **100%** | **0%** | **11%** | | | |
| **Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets** | **100%** | **0%** | **12%** | | | |
| **Insurance Carriers & Related Activities and Funds & Other Financial Vehicles** | **100%** | **0%** | **2%** | | | |
| **Fabricated Metal Product Manufacturing** | **100%** | **0%** | **9%** | | | |
| **Securities, Commodity Contracts, and Other Intermediation and Related Activities** | **100%** | **0%** | **0%** | | | |
| **Textile Mills & Textile Product Mills** | **100%** | **0%** | **0%** | | | |
| **Post-Secondary Education** | **100%** | **0%** | **6%** | | | |
| **Security Services** | **100%** | **0%** | **5%** | | | |
| **Performing Arts, Spectator Sports and Related Industries** | **100%** | **0%** | **11%** | | | |
| **Employment Services** | **100%** | **0%** | **14%** | | | |
| **University Education** | **100%** | **0%** | **4%** | | | |
| **Retail Trade** | **100%** | **0%** | **22%** | | | |
| **Real Estate** | **100%** | **0%** | **12%** | | | |
| **Transportation Equipment Manufacturing** | **100%** | **0%** | **6%** | | | |
| **Miscellaneous Manufacturing** | **100%** | **0%** | **8%** | | | |
| **Transportation** | **100%** | **0%** | **5%** | | | |
| **Monetary Authorities - Central Bank & Credit Intermediation and Related Activities** | **100%** | **0%** | **2%** | | | |
| **Repair and Maintenance** | **100%** | **0%** | **11%** | | | |
| **Beverage and Tobacco Product Manufacturing** | **100%** | **0%** | **10%** | | | |
| **Mining and Oil and Gas Extraction** | **100%** | **0%** | **24%** | | | |
| **Prime Contracting** | **100%** | **0%** | **17%** | | | |
| **Primary Metal Manufacturing** | **100%** | **0%** | **15%** | | | |
| **Business Services** | **100%** | **0%** | **7%** | | | |
| **Furniture and Related Product Manufacturing** | **100%** | **0%** | **10%** | | | |
| **Paper Manufacturing** | **100%** | **0%** | **19%** | | | |
| **Warehousing and Storage** | **100%** | **0%** | **5%** | | | |
| **Fishing, Hunting and Trapping** | **100%** | **0%** | **0%** | | | |
| **Waste Management and Remediation Services** | **100%** | **0%** | **25%** | | | |
| **Non-Metallic Mineral Product Manufacturing** | **100%** | **0%** | **18%** | | | |
| **Wood Product Manufacturing** | **100%** | **0%** | **21%** | | | |
| **Motion Picture and Sound Recording Industries** | **100%** | **0%** | **17%** | | | |
| **Plastics and Rubber Products Manufacturing** | **100%** | **0%** | **21%** | | | |
| **Food Manufacturing** | **100%** | **0%** | **29%** | | | |
| **Amusement, Gambling and Recreation Industries** | **100%** | **0%** | **31%** | | | |
| **Food Services and Drinking Places** | **100%** | **0%** | **26%** | | | |
| **Forestry and Logging with support activities** | **100%** | **0%** | **34%** | | | |

| | | | |
|---|---|---|---|
| **Clothing Manufacturing & Leather & Allied Product Manufacturing** | **100%** | **0%** | **30%** |
| **Accommodation Services** | **100%** | **0%** | **50%** |
| **Building Services** | **100%** | **0%** | **78%** |

**Table 2.10**

**Proportion of total employment by literacy skill demand level, occupations, Alberta, 2006**

| | Total | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Level 3+ |
|---|---|---|---|---|---|---|---|
| **All occupations** | **100** | **0** | **15** | **54** | **22** | **9** | **85** |

| | | | |
|---|---|---|---|
| **All Occupations** | 100% | 0% | 15% |
| **Nurse Supervisors and Registered Nurses** | **100%** | **0%** | **0%** |
| **Professional Occupations in Business and Finance** | **100%** | **0%** | **0%** |
| **Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations** | **100%** | **0%** | **0%** |
| **Teachers and Professors** | **100%** | **0%** | **0%** |
| **Retail Salespersons and Sales Clerks** | **100%** | **0%** | **0%** |
| **Professional Occupations in Natural and Applied Sciences** | **100%** | **0%** | **0%** |
| **Professional Occupations in Art and Culture** | **100%** | **0%** | **0%** |
| **Contractors and Supervisors in Trades and Transportation** | **100%** | **0%** | **0%** |
| **Professional Occupations in Health** | **100%** | **0%** | **0%** |
| **Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers** | **100%** | **0%** | **0%** |
| **Technical and Related Occupations in Health** | **100%** | **0%** | **0%** |
| **Childcare and Home Support Workers** | **100%** | **0%** | **0%** |
| **Other Trades N.E.C.** | **100%** | **0%** | **16%** |
| **Technical Occupations Related to Natural and Applied Sciences** | **100%** | **0%** | **0%** |
| **Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.** | **100%** | **0%** | **0%** |
| **Occupations in Protective Services** | **100%** | **0%** | **0%** |
| **Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers** | **100%** | **0%** | **0%** |
| **Administrative and Regulatory Occupations** | **100%** | **0%** | **0%** |
| **Mechanics** | **100%** | **0%** | **1%** |
| **Clerical Occupations** | **100%** | **0%** | **4%** |
| **Occupations in Travel and Accommodation Including Attendants in Recreation and Sport** | **100%** | **0%** | **15%** |
| **Machinists, Metal Forming, Shaping and Erecting Occupations** | **100%** | **0%** | **0%** |
| **Construction Trades** | **100%** | **0%** | **3%** |
| **Supervisors in Manufacturing** | **100%** | **0%** | **30%** |
| **Technical Occupations in Art, Culture, Recreation and Sport** | **100%** | **0%** | **0%** |
| **Assemblers in Manufacturing** | **100%** | **0%** | **0%** |
| **Heavy Equipment and Crane Operators Including Drillers** | **100%** | **0%** | **2%** |
| **Sales and Service Supervisors** | **100%** | **0%** | **20%** |
| **Secretaries** | **100%** | **0%** | **0%** |
| **Finance and Insurance Administrative Occupations** | **100%** | **0%** | **0%** |

| | | | | | |
|---|---|---|---|---|---|
| **Senior Management Occupations** | **100%** | **0%** | **0%** | | |
| **Specialist Managers** | **100%** | **0%** | **0%** | | |
| **Clerical Supervisors** | **100%** | **0%** | **0%** | | |
| **Assisting Occupations in Support of Health Services** | **100%** | **0%** | **0%** | | |
| **Other Managers N.E.C.** | **100%** | **0%** | **0%** | | |
| **Transportation Equipment Operators and Related Workers, Excluding Labourers** | **100%** | **0%** | **1%** | | |
| **Occupations in Food and Beverage Service** | **100%** | **0%** | **16%** | | |
| **Chefs and Cooks** | **100%** | **0%** | **17%** | | |
| **Machine Operators in Manufacturing** | **100%** | **0%** | **27%** | | |
| **Managers in Retail Trade, Food and Accommodation Services** | **100%** | **0%** | **29%** | | |
| **Sales & Service Occupations N.E.C.** | **100%** | **0%** | **61%** | | |
| **Trades Helpers, Construction, and Transportation Labourers and Related Occupations** | **100%** | **0%** | **57%** | | |
| **Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers** | **100%** | **0%** | **70%** | | |
| **Occupations Unique to Agriculture Excluding Labourers** | **100%** | **0%** | **71%** | | |
| **Cashiers** | **100%** | **0%** | **100%** | | |
| **Labourers in Processing, Manufacturing and Utilities** | **100%** | **0%** | **100%** | | |

**Table 2.11**

**Projected aggregate job gains and rates of employment growth by occupation, Canada, 2006-2016**

| | Projected rate of change 2006 to 2016 | Projected absolute change in employment 2006 to 2016 |
|---|---|---|
| Occupation | Percent | Number |
| Senior management occupations | 120.1 | 100 |
| Specialist managers | 25.1 | 88 |
| Managers in retail trade, food and accommodation services | 42.4 | 237 |
| Other managers N.E.C. | 42.9 | 228 |
| Professional occupations in business and finance | 48.3 | 232 |
| Finance and insurance administrative occupations | 51.0 | 123 |
| Secretaries | 20.0 | 42 |
| Administrative and regulatory occupations | 47.0 | 159 |
| Clerical supervisors | 42.3 | 65 |
| Clerical occupations | 32.8 | 523 |
| Professional occupations in natural and applied sciences | 42.7 | 268 |
| Technical occupations related to natural and applied sciences | 33.9 | 181 |
| Professional occupations in health | 63.6 | 122 |
| Nurse supervisors and registered nurses | 69.4 | 184 |
| Technical and related occupations in health | 66.7 | 156 |
| Assisting occupations in support of health services | 42.8 | 126 |
| Judges, lawyers, psychologists, social workers, ministers of religion, and policy and program officers | 7.1 | 25 |
| Teachers and professors | 46.9 | 328 |
| Paralegals, social services workers and occupations in education and religion, N.E.C. | 86.6 | 324 |

| | | |
|---|---|---|
| Professional occupations in art and culture | 33.8 | 75 |
| Technical occupations in art, culture, recreation and sport | 36.1 | 98 |
| Sales and service supervisors | 36.1 | 78 |
| Wholesale, technical, insurance, real estate sales specialists, and retail, wholesale and grain buyers | 24.3 | 129 |
| Retail salespersons and sales clerks | 34.7 | 192 |
| Cashiers | 19.0 | 67 |
| Chefs and cooks | 37.9 | 86 |
| Occupations in food and beverage service | 69.6 | 174 |
| Occupations in protective services | 38.3 | 85 |
| Occupations in travel and accommodation including attendants in recreation and sport | 35.3 | 40 |
| Childcare and home support workers | 63.8 | 125 |
| Sales and service occupations N.E.C. | 22.8 | 278 |
| Contractors and supervisors in trades and transportation | 40.9 | 103 |
| Construction trades | 34.9 | 126 |
| Stationary engineers, power station operators and electrical trades and telecommunications occupations | 45.2 | 82 |
| Machinists, metal forming, shaping and erecting occupations | 18.7 | 39 |
| Mechanics | 33.1 | 119 |
| Other trades N.E.C. | 9.6 | 13 |
| Heavy equipment and crane operators Including drillers | 16.8 | 19 |
| Transportation equipment operators and related workers, excluding Labourers | 48.1 | 246 |
| Trades helpers, construction, and transportation Labourers and related occupations | 28.4 | 107 |
| Occupations unique to agriculture excluding labourers | 28.2 | 106 |
| Occupations unique to forestry operations, mining, oil and gas extraction, and fishing, excluding labourers | 34.7 | 48 |
| Primary production labourers | 20.5 | 25 |
| Supervisors in manufacturing | 11.1 | 15 |
| Machine operators in manufacturing | 6.4 | 31 |
| Assemblers in manufacturing | 25.9 | 59 |
| Labourers in processing, manufacturing and utilities | 7.3 | 15 |

**Source:** COPS, 2009.

**Table 2.12**

**Actual aggregate job gains and losses and as a proportion of 2006 employment levels by average literacy skill demand, selected occupations, May 2006 to September 2008, Canada**

| | Ranks | | |
|---|---|---|---|
| Occupations | Rate of Change May 2006-Sept 2008 | Percent change in employment | Absolute change in employment |
| Senior management occupations | -16 | 43 | 38 |
| Specialist managers | 11 | 13 | 7 |
| Managers in retail trade, food and accommodation services | -9 | 38 | 42 |
| Other managers N.E.C. | 7 | 22 | 10 |
| Professional occupations in business and finance | 19 | 5 | 1 |
| Finance and insurance administrative occupations | 6 | 23 | 24 |
| Secretaries | 28 | 1 | 11 |

| | | | |
|---|---|---|---|
| Administrative and regulatory occupations | 23 | 4 | 2 |
| Clerical supervisors | -10 | 39 | 37 |
| Clerical occupations | -4 | 36 | 45 |
| Professional occupations in natural and applied sciences | 4 | 25 | 17 |
| Technical occupations related to natural and applied sciences | 10 | 15 | 6 |
| Professional occupations in health | 17 | 6 | 13 |
| Nurse supervisors and registered nurses | 24 | 3 | 3 |
| Technical and related occupations in health | 14 | 12 | 15 |
| Assisting occupations in support of health services | -6 | 37 | 36 |
| Judges, lawyers, psychologists, social workers, ministers of religion, and policy and program officers | 14 | 10 | 5 |
| Teachers and professors | 8 | 20 | 4 |
| Paralegals, social services workers and occupations in education and religion, N.E.C. | 8 | 19 | 14 |
| Professional occupations in art and culture | 16 | 9 | 12 |
| Technical occupations in art, culture, recreation and sport | 17 | 8 | 9 |
| Sales and service supervisors | 14 | 11 | 16 |
| Wholesale, technical, insurance, real estate sales specialists, and retail, wholesale and grain buyers | -4 | 35 | 39 |
| Retail salespersons and sales clerks | 0 | 33 | 34 |
| Cashiers | 1 | 31 | 31 |
| Chefs and cooks | 10 | 16 | 19 |
| Occupations in food and beverage service | 27 | 2 | 8 |
| Occupations in protective services | 0 | 32 | 32 |
| Occupations in travel and accommodation including attendants in recreation and sport | 9 | 17 | 26 |
| Childcare and home support workers | 9 | 18 | 23 |
| Sales and service occupations N.E.C. | 1 | 29 | 20 |
| Contractors and supervisors in trades and transportation | 7 | 21 | 21 |
| Construction trades | 6 | 24 | 22 |
| Stationary engineers, power station operators and electrical trades and telecommunications occupations | 1 | 30 | 29 |
| Machinists, metal forming, shaping and erecting occupations | 0 | 34 | 33 |
| Mechanics | 2 | 27 | 28 |
| Other trades N.E.C. | 17 | 7 | 18 |
| Heavy equipment and crane operators including drillers | 3 | 26 | 30 |
| Transportation equipment operators and related workers, excluding labourers | 2 | 28 | 27 |
| Trades helpers, construction, and transportation labourers and related occupations | -15 | 42 | 43 |
| Occupations unique to agriculture excluding labourers | -21 | 44 | 44 |
| Occupations unique to forestry operations, mining, oil and gas extraction, and fishing, excluding labourers | -11 | 40 | 35 |
| Primary production labourers | -34 | 47 | 41 |
| Supervisors in manufacturing | 11 | 14 | 25 |
| Machine operators in manufacturing | -25 | 45 | 47 |
| Assemblers in manufacturing | -28 | 46 | 46 |
| Labourers in processing, manufacturing and utilities | -12 | 41 | 40 |

**Source:** COPS, 2009.

**Table 2.13**

**Absolute and percentage change in employment, Alberta, May 2006 to September 2008**

| | Rate of change May 2006-September 2008 | Absolute change in employment |
|---|---|---|
| Industry | Percent | Number (000"s) |

Table 2.13 Absolute and percentage change in employment for , 48-Alberta, May 2006 to September 2008

| | Rate of Change May2006 - Sept2008 | Absolute change in employment |
|---|---|---|
| Crop Production | 11.7% | 1.9 |
| Animal Production | 38.5% | 11.4 |
| Mix farming | -53.9% | -5.5 |
| Support Activities for Agriculture | 158.8% | 2.7 |
| Forestry and Logging with support activities | -14.6% | -0.6 |
| Fishing, Hunting and Trapping | 0.0% | 0.0 |
| Mining and Oil and Gas Extraction | 11.2% | 15.1 |
| Prime Contracting | 37.9% | 23.7 |
| Trade Contracting | 14.8% | 16.5 |
| Food Manufacturing | 2.1% | 0.5 |
| Beverage and Tobacco Product Manufacturing | 0.0% | 0.0 |
| Textile Mills & Textile Product Mills | 0.0% | 0.0 |
| Clothing Manufacturing & Leather & Allied Product Manufacturing | -100.0% | -2.0 |
| Wood Product Manufacturing | 3.8% | 0.5 |
| Paper Manufacturing | 10.0% | 0.3 |
| Printing and Related Support Activities | 52.2% | 2.4 |
| Petroleum and Coal Products Manufacturing | 23.8% | 1.0 |
| Chemical Manufacturing | -13.6% | -1.5 |
| Plastics and Rubber Products Manufacturing | -19.7% | -1.6 |
| Non-Metallic Mineral Product Manufacturing | 11.4% | 0.8 |
| Primary Metal Manufacturing | 66.7% | 2.4 |
| Fabricated Metal Product Manufacturing | 6.6% | 1.2 |
| Machinery Manufacturing | 44.1% | 5.2 |
| Computer and Electronic Product Manufacturing | 4.4% | 0.3 |
| Electrical Equipment, Appliance and Component Manufacturing | -15.6% | -0.5 |
| Transportation Equipment Manufacturing | 11.4% | 0.5 |
| Furniture and Related Product Manufacturing | 60.9% | 2.8 |
| Miscellaneous Manufacturing | 5.4% | 0.4 |
| Wholesale Trade | 22.2% | 15.9 |
| Retail Trade | 6.1% | 12.9 |

| | | |
|---|---|---|
| Transportation | -5.9% | -6.3 |
| Warehousing and Storage | -14.8% | -0.8 |
| Monetary Authorities - Central Bank & Credit Intermediation and Related Activities | -6.2% | -2.2 |
| Securities, Commodity Contracts, and Other Intermediation and Related Activities | 82.4% | 5.6 |
| Insurance Carriers & Related Activities and Funds & Other Financial Vehicles | 5.6% | 1.2 |
| Real Estate | -27.9% | -6.7 |
| Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets | 46.6% | 5.4 |
| Legal Services | -20.9% | -4.1 |
| Accounting and Tax Preparation | 36.1% | 6.1 |
| Architectural, Engineering and Design Services | 14.3% | 8.5 |
| Computer System Design Services | 1.7% | 0.3 |
| Management, Scientific and Technical Services | 63.6% | 11.7 |
| Advertising and Related Services | 20.3% | 1.2 |
| Other Professional Services | 72.2% | 2.6 |
| Employment Services | -45.1% | -2.3 |
| Business Services | -38.8% | -3.8 |
| Travelling Services | 45.5% | 1.5 |
| Security Services | 110.8% | 7.2 |
| Building Services | -3.5% | -1.0 |
| Management of Enterprises and Other Administrative Services | -18.4% | -0.7 |
| Waste Management and Remediation Services | 40.5% | 1.5 |
| Publishing Industries | -22.2% | -1.8 |
| Motion Picture and Sound Recording Industries | -18.5% | -0.5 |
| Broadcasting and Telecommunications | -11.0% | -2.0 |
| Information Services and Data Processing Services | -8.7% | -0.4 |
| Primary and Secondary Education | 3.3% | 2.6 |
| Post-Secondary Education | -16.2% | -2.9 |
| University Education | -16.3% | -4.3 |
| Other Schools and Educational Support | 16.2% | 1.6 |
| Ambulatory Health Care Services | -4.4% | -2.1 |
| Hospitals | -5.0% | -3.6 |
| Nursing and Residential Care Facilities | 15.0% | 3.8 |
| Social Assistance | -11.9% | -4.9 |
| Performing Arts, Spectator Sports and Related Industries | 24.2% | 2.3 |
| Heritage Institutions | 104.2% | 2.5 |
| Amusement, Gambling and Recreation Industries | 20.3% | 4.3 |
| Accommodation Services | -23.3% | -6.9 |
| Food Services and Drinking Places | 13.3% | 11.2 |
| Repair and Maintenance | -3.6% | -1.5 |
| Personal and Laundry Services | 16.4% | 3.6 |
| Religious, Grant-Making, Civic, and Professional and Similar Organizations | -29.7% | -5.7 |
| Private Households | 11.7% | 0.7 |
| Federal Government Public Administration (including Defence Services) | -7.0% | -1.3 |
| Provincial and Territorial Public Administration | -5.2% | -1.5 |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | -15.0% | -5.9 |

**Source:** Labour Force Survey.

**Table 2.14**

**Actual aggregate job gains and losses and as a proportion of 2006 employment levels by industry, May 2006 to September 2008, Canada and the provinces**

| | | | Non-seasonally adjusted, in thousands | | | |
|---|---|---|---|---|---|---|
| | | | Canada | | Newfoundland and Labrador | |
| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | May-2006 | September-2008 | May-2006 | September-2008 |
| **All industries** | | | **16,676.0** | **17,230.2** | **220.0** | **224.1** |
| Goods-producing sector | 11, 21, 22, 23, 31, 32, 33 | | 4,054.8 | 4,170.7 | 56.9 | 53.5 |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 2.6 | 0.6 |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 0.9 | 0.0 |
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 1.6 | 0.6 |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 0.0 | 0.0 |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 0.0 | 0.0 |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | 5.75 | 332.0 | 351.1 | 19.8 | 18.1 |
| Forestry and logging with support activities | 1131-1133, 1153 | -7.94 | 56.7 | 52.2 | 0.0 | 0.0 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 11.0 | 8.1 |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 8.5 | 9.7 |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 0.6 | 3.3 |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | 18.53 | 68.0 | 80.6 | 5.6 | 3.5 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 2.4 | 2.9 |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 2.4 | 1.9 |
| Construction | 2361-2389 | 21.36 | 1,079.2 | 1,309.7 | 11.9 | 18.3 |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 6.3 | 8.7 |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 5.6 | 9.5 |
| Manufacturing | 3111-3399 | -6.51 | 2,150.2 | 2,010.3 | 20.2 | 14.6 |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 11.9 | 7.2 |
| Beverage and tobacco product manufacturing | 3121-3122 | 30.40 | 35.2 | 45.9 | 1.2 | 0.0 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | -19.29 | 28.0 | 22.6 | 0.0 | 0.0 |
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 0.0 | 0.0 |
| Wood product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 0.6 | 0.0 |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 1.0 | 1.8 |
| Printing and related support activities | 3231 | 17.97 | 92.4 | 109.0 | 0.0 | 0.5 |
| Petroleum and coal products manufacturing | 3241 | 8.33 | 19.2 | 20.8 | 0.7 | 0.5 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 0.0 | 0.0 |
| Plastics and rubber products manufacturing | 3261-3262 | -25.40 | 130.7 | 97.5 | 0.0 | 0.5 |
| Non-metallic mineral product manufacturing | 3271-3279 | 0.00 | 66.9 | 66.9 | 0.0 | 0.0 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 0.0 | 0.0 |
| Fabricated metal product manufacturing | 3321-3329 | -5.44 | 191.1 | 180.7 | 0.0 | 0.0 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 0.0 | 0.0 |
| Computer and electronic product manufacturing | 3341-3346 | -2.70 | 111.1 | 108.1 | 0.5 | 0.0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 0.0 | 0.0 |
| Transportation equipment manufacturing | 3361-3369 | -12.86 | 312.5 | 272.3 | 1.5 | 0.8 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 0.0 | 0.0 |
| Other transportation equipment manufacturing | 3364-3369 | 4.38 | 79.9 | 83.4 | 1.5 | 0.8 |
| Furniture and related product manufacturing | 3371-3379 | 5.49 | 103.9 | 109.6 | 0.6 | 0.7 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 0.0 | 0.0 |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1317.9 | 1182.4 | 4.6 | 3.7 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 15.7 | 11.0 |
| Services-producing sector | 41 and over | 3.47 | 12,621.2 | 13,059.5 | 163.0 | 170.6 |
| Trade | 4111-4543 | -1.24 | 2,665.5 | 2,632.4 | 37.0 | 33.5 |
| Wholesale trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 6.9 | 3.3 |
| Farm product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 0.0 | 0.0 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 0.0 | 0.5 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 3.7 | 0.0 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 0.5 | 0.0 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 0.0 | 0.5 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 0.0 | 0.0 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 0.7 | 0.0 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 1.3 | 0.8 |
| Retail trade | 4411-4543 | -2.13 | 2,032.4 | 1,989.2 | 30.2 | 30.2 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 1.9 | 3.3 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 0.5 | 1.6 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 0.0 | 1.1 |
| Building material and garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 2.3 | 3.3 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 10.1 | 7.0 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 1.8 | 3.8 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 2.5 | 1.8 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 2.6 | 1.3 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 1.1 | 1.1 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 4.1 | 4.4 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 2.3 | 1.0 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 0.9 | 0.6 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 12.0 | 10.3 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 11.9 | 10.1 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 1.2 | 1.4 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 0.0 | 0.0 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 1.9 | 1.7 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 2.8 | 2.0 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 0.7 | 1.5 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.0 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 2.1 | 1.8 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 2.5 | 0.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 0.0 | 0.8 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 0.0 | 0.0 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1,056.4 | 1,058.7 | 6.2 | 7.0 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 2.6 | 1.9 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 0.5 | 0.8 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 1.2 | 2.0 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 1.5 | 1.5 |
| Rental and leasing services and owners and lessors of other non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 0.5 | 0.8 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1,107.9 | 1,184.7 | 6.4 | 7.9 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 0.9 | 1.2 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 0.6 | 0.0 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 1.8 | 3.0 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 1.0 | 1.2 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 1.0 | 1.2 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 0.5 | 0.0 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 0.6 | 0.6 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 8.7 | 8.0 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 0.6 | 0.0 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 3.2 | 3.2 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 0.8 | 0.0 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 1.5 | 1.0 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 2.2 | 2.4 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 0.0 | 0.0 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 0.0 | 0.0 |
| Educational services | 6111-6117 | 1.13 | 1179.3 | 1192.6 | 16.3 | 17.5 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 9.8 | 11.3 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 1.3 | 2.4 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 4.0 | 3.3 |
| Other schools and educational support | 6114-6117 | 2.27 | 101.1 | 103.4 | 1.2 | 0.5 |
| Health care and social assistance | 6211-6244 | 8.29 | 1,780.3 | 1,927.9 | 29.6 | 31.7 |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 5.2 | 5.6 |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 13.4 | 15.2 |
| Nursing and residential care facilities | 6230 | 12.05 | 307.9 | 345.0 | 4.2 | 5.0 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 6.8 | 5.9 |
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 8.5 | 8.6 |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 1.6 | 1.6 |
| Motion picture and sound recording industries | 5121-5122 | -2.88 | 62.5 | 60.7 | 0.0 | 0.5 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | -6.64 | 201.7 | 188.3 | 3.5 | 3.6 |
| Information services and data processing services | 5181-5191 | 6.52 | 53.7 | 57.2 | 0.0 | 0.5 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 1.4 | 0.0 |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 0.6 | 0.8 |
| Amusement, gambling and recreation industries | 7131-7139 | -0.63 | 205.1 | 203.8 | 1.3 | 1.4 |
| Accommodation and food services | 7211-7224 | 7.96 | 1011.5 | 1092.0 | 12.8 | 14.4 |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 3.2 | 4.1 |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 9.5 | 10.3 |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 10.8 | 12.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 2.3 | 3.1 |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 2.3 | 3.2 |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 3.0 | 3.2 |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 3.2 | 3.4 |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 14.8 | 19.0 |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 6.0 | 7.3 |
| Provincial and territorial public administration | 9120 | 1.77 | 254.6 | 259.1 | 5.9 | 8.5 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 2.9 | 3.1 |

**Non-seasonally adjusted, in thousands**

| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | Canada May-Sepetember-2006 | Canada 2008 | Nova Scotia May-Sepetember-2006 | Nova Scotia 2008 |
|---|---|---|---|---|---|---|
| **All industries** | | | **16,676.0** | **17,230.2** | **451.8** | **458.4** |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4,054.8 | 4,170.7 | 91.4 | 96.3 |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 5.0 | 6.3 |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 1.9 | 2.9 |
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 2.6 | 3.0 |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 0.0 | 0.0 |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 0.0 | 0.0 |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | 5.75 | 332.0 | 351.1 | 15.5 | 11.7 |
| Forestry and logging with support activities | 1131-1133, 1153 | -7.94 | 56.7 | 52.2 | 2.6 | 2.9 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 9.8 | 4.7 |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 3.1 | 4.1 |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 0.0 | 0.8 |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | 18.53 | 68.0 | 80.6 | 1.4 | 1.4 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 1.4 | 1.9 |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 1.5 | 3.2 |
| Construction | 2361-2389 | 21.36 | 1,079.2 | 1,309.7 | 27.7 | 33.9 |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 10.8 | 11.6 |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 16.9 | 22.3 |
| Manufacturing | 3111-3399 | -6.51 | 2,150.2 | 2,010.3 | 41.6 | 41.2 |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 11.5 | 10.0 |
| Beverage and tobacco product manufacturing | 3121-3122 | 30.40 | 35.2 | 45.9 | 1.2 | 1.2 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | -19.29 | 28.0 | 22.6 | 0.8 | 2.0 |
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 1.3 | 1.0 |
| Wood product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 2.6 | 2.9 |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 2.6 | 1.7 |
| Printing and related support activities | 3231 | 17.97 | 92.4 | 109.0 | 2.4 | 1.7 |
| Petroleum and coal products manufacturing | 3241 | 8.33 | 19.2 | 20.8 | 0.0 | 0.7 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 0.5 | 1.2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Plastics and rubber products manufacturing | 3261-3262 | -25.40 | 130.7 | 97.5 | 5.9 | 5.6 |
| Non-metallic mineral product manufacturing | 3271-3279 | 0.00 | 66.9 | 66.9 | 1.2 | 1.6 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 0.6 | 0.0 |
| Fabricated metal product manufacturing | 3321-3329 | -5.44 | 191.1 | 180.7 | 2.0 | 2.3 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 0.6 | 1.0 |
| Computer and electronic product manufacturing | 3341-3346 | -2.70 | 111.1 | 108.1 | 0.7 | 2.2 |
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 0.0 | 0.0 |
| Transportation equipment manufacturing | 3361-3369 | -12.86 | 312.5 | 272.3 | 3.9 | 4.3 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 0.7 | 0.0 |
| Other transportation equipment manufacturing | 3364-3369 | 4.38 | 79.9 | 83.4 | 3.1 | 4.2 |
| Furniture and related product manufacturing | 3371-3379 | 5.49 | 103.9 | 109.6 | 1.4 | 0.9 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 1.8 | 0.5 |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1,317.9 | 1,182.4 | 15.1 | 16.2 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 26.5 | 25.0 |
| Services-producing sector | 41 and over | 3.47 | 1,2621.2 | 13,059.5 | 360.5 | 362.1 |
| Trade | 4111-4543 | -1.24 | 2,665.5 | 2,632.4 | 81.8 | 79.3 |
| Wholesale trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 16.3 | 12.5 |
| Farm product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 0.0 | 0.0 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 0.0 | 0.0 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 4.3 | 2.2 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 1.0 | 1.2 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 1.1 | 1.0 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 1.5 | 3.1 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 5.0 | 3.0 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 2.8 | 1.7 |
| Retail trade | 4411-4543 | -2.13 | 2,032.4 | 1,989.2 | 65.5 | 66.8 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 4.6 | 6.8 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 2.1 | 3.0 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 1.6 | 2.8 |
| Building material and garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 5.2 | 6.1 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 18.6 | 19.4 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 5.2 | 6.6 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 2.9 | 1.7 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 4.3 | 4.3 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 2.3 | 2.5 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 11.2 | 9.1 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 5.8 | 3.1 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 1.6 | 1.5 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 20.1 | 17.9 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 20.0 | 17.6 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 3.0 | 1.9 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 0.6 | 0.6 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 1.9 | 0.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 5.0 | 4.5 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 2.6 | 4.2 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.0 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 2.8 | 3.3 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 2.2 | 1.9 |
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 1.8 | 0.7 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 0.0 | 0.0 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1,056.4 | 1,058.7 | 21.1 | 22.7 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 5.4 | 8.1 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 1.3 | 2.0 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 5.7 | 5.7 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 5.6 | 5.6 |
| Rental and leasing services and owners and lessors of other non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 3.0 | 1.3 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1,107.9 | 1,184.7 | 18.6 | 23.4 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 4.5 | 3.5 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 1.0 | 3.2 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 3.5 | 5.5 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 5.1 | 5.2 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 1.9 | 3.1 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 0.9 | 1.3 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 1.8 | 1.7 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 29.0 | 22.8 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 1.3 | 0.8 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 14.4 | 8.9 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 0.0 | 1.0 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 3.3 | 3.2 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 7.2 | 7.3 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 0.6 | 0.7 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 1.9 | 0.8 |
| Educational services | 6111-6117 | 1.13 | 1,179.3 | 1,192.6 | 35.2 | 33.8 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 21.7 | 18.7 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 1.7 | 2.7 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 8.9 | 10.6 |
| Other schools and educational support | 6114-6117 | 2.27 | 101.1 | 103.4 | 2.9 | 1.7 |
| Health care and social assistance | 6211-6244 | 8.29 | 1,780.3 | 1927.9 | 60.8 | 62.0 |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 10.5 | 12.6 |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 25.1 | 24.1 |
| Nursing and residential care facilities | 6230 | 12.05 | 307.9 | 345.0 | 12.5 | 14.7 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 12.8 | 10.6 |
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 15.6 | 18.3 |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 2.6 | 1.6 |
| Motion picture and sound recording industries | 5121-5122 | -2.88 | 62.5 | 60.7 | 1.6 | 2.0 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | -6.64 | 201.7 | 188.3 | 4.9 | 3.6 |
| Information services and data processing services | 5181-5191 | 6.52 | 53.7 | 57.2 | 0.5 | 1.1 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 1.5 | 3.1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 0.5 | 1.7 |
| Amusement, gambling and recreation industries | 7131-7139 | -0.63 | 205.1 | 203.8 | 4.1 | 5.3 |
| Accommodation and food services | 7211-7224 | 7.96 | 1,011.5 | 1,092.0 | 28.8 | 32.7 |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 5.6 | 8.5 |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 23.2 | 24.2 |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 20.9 | 19.1 |
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 6.2 | 6.9 |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 5.6 | 5.4 |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 5.8 | 5.5 |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 3.3 | 1.3 |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 28.5 | 30.2 |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 13.3 | 15.1 |
| Provincial and territorial public administration | 9120 | 1.77 | 254.6 | 259.1 | 10.1 | 9.8 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 5.2 | 5.3 |

**Non-seasonally adjusted, in thousands**

| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | Canada May-Sepetember- 2006 | Canada May-Sepetember- 2008 | Prince Edward Island May-Sepetember- 2006 | Prince Edward Island May-Sepetember- 2008 |
|---|---|---|---|---|---|---|
| All industries | | | 16,676.0 | 17,230.2 | 72.7 | 73.0 |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4,054.8 | 4,170.7 | 21.9 | 18.7 |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 4.6 | 3.3 |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 2.5 | 1.7 |
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 1.9 | 1.3 |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 0.0 | 0.0 |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 0.0 | 0.2 |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | 5.75 | 332.0 | 351.1 | 3.4 | 3.3 |
| Forestry and logging with support activities | 1131-1133, 1153 | -7.94 | 56.7 | 52.2 | 0.0 | 0.4 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 3.2 | 2.4 |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 0.0 | 0.5 |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 0.0 | 0.0 |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | 18.53 | 68.0 | 80.6 | 0.0 | 0.0 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 0.0 | 0.4 |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 0.4 | 0.2 |
| Construction | 2361-2389 | 21.36 | 1,079.2 | 1,309.7 | 6.2 | 5.8 |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 3.3 | 2.8 |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 2.9 | 3.0 |
| Manufacturing | 3111-3399 | -6.51 | 2,150.2 | 2,010.3 | 7.3 | 6.1 |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 4.0 | 3.3 |
| Beverage and tobacco product manufacturing | 3121-3122 | 30.40 | 35.2 | 45.9 | 0.0 | 0.0 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | -19.29 | 28.0 | 22.6 | 0.0 | 0.0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 0.0 | 0.0 |
| Wood product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 0.3 | 0.3 |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 0.3 | 0.2 |
| Printing and related support activities | 3231 | 17.97 | 92.4 | 109.0 | 0.0 | 0.0 |
| Petroleum and coal products manufacturing | 3241 | 8.33 | 19.2 | 20.8 | 0.0 | 0.0 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 0.6 | 0.3 |
| Plastics and rubber products manufacturing | 3261-3262 | -25.40 | 130.7 | 97.5 | 0.2 | 0.0 |
| Non-metallic mineral product manufacturing | 3271-3279 | 0.00 | 66.9 | 66.9 | 0.2 | 0.0 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 0.0 | 0.0 |
| Fabricated metal product manufacturing | 3321-3329 | -5.44 | 191.1 | 180.7 | 0.2 | 0.0 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 0.0 | 0.2 |
| Computer and electronic product manufacturing | 3341-3346 | -2.70 | 111.1 | 108.1 | 0.0 | 0.0 |
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 0.0 | 0.0 |
| Transportation equipment manufacturing | 3361-3369 | -12.86 | 312.5 | 272.3 | 0.6 | 1.1 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 0.0 | 0.0 |
| Other transportation equipment manufacturing | 3364-3369 | 4.38 | 79.9 | 83.4 | 0.6 | 1.1 |
| Furniture and related product manufacturing | 3371-3379 | 5.49 | 103.9 | 109.6 | 0.2 | 0.0 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 0.3 | 0.0 |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1,317.9 | 1,182.4 | 2.0 | 2.0 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 5.3 | 4.1 |
| Services-producing sector | 41 and over | 3.47 | 12,621.2 | 13,059.5 | 50.8 | 54.2 |
| Trade | 4111-4543 | -1.24 | 2,665.5 | 2,632.4 | 10.0 | 11.0 |
| Wholesale trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 1.3 | 1.5 |
| Farm product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 0.0 | 0.0 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 0.0 | 0.0 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 0.2 | 0.5 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 0.0 | 0.0 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 0.3 | 0.0 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 0.0 | 0.0 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 0.5 | 0.4 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 0.2 | 0.2 |
| Retail trade | 4411-4543 | -2.13 | 2,032.4 | 1,989.2 | 8.7 | 9.5 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 0.8 | 1.1 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 0.3 | 0.4 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 0.2 | 0.0 |
| Building material and garden equipment and supplies dealers | 4441-4442 | 1.79 | 1,45.2 | 147.8 | 1.1 | 1.3 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 2.2 | 2.8 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 0.6 | 0.7 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 0.6 | 0.7 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 0.6 | 0.7 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 0.0 | 0.2 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 1.2 | 0.7 |

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|---|---|---|---|---|---|---|
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 0.7 | 0.5 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 0.5 | 0.3 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 2.0 | 2.7 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 2.0 | 2.6 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 0.0 | 0.0 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 0.0 | 0.0 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 0.2 | 0.0 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 0.7 | 1.0 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 0.2 | 0.5 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.0 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 0.3 | 0.8 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 0.3 | 0.2 |
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 0.2 | 0.0 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 0.0 | 0.0 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1,056.4 | 1,058.7 | 2.0 | 2.6 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 0.6 | 1.0 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 0.2 | 0.0 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 0.6 | 0.6 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 0.5 | 0.7 |
| Rental and leasing services and owners and lessors of other non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 0.2 | 0.2 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1,107.9 | 1,184.7 | 3.2 | 2.5 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 0.4 | 0.5 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 0.6 | 0.4 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 0.5 | 0.4 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 0.9 | 0.5 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 0.4 | 0.4 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 0.0 | 0.0 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 0.3 | 0.2 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 3.1 | 2.8 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 0.0 | 0.0 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 1.6 | 1.0 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 0.2 | 0.2 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 0.2 | 0.4 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 0.8 | 0.7 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 0.0 | 0.2 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 0.2 | 0.3 |
| Educational services | 6111-6117 | 1.13 | 1,179.3 | 1,192.6 | 4.7 | 4.9 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 3.5 | 2.4 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 0.5 | 0.4 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 0.6 | 1.7 |
| Other schools and educational support | 6114-6117 | 2.27 | 101.1 | 103.4 | 0.2 | 0.5 |
| Health care and social assistance | 6211-6244 | 8.29 | 1,780.3 | 1,927.9 | 8.1 | 8.4 |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 1.1 | 1.1 |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 3.0 | 3.4 |
| Nursing and residential care facilities | 6230 | 12.05 | 307.9 | 345.0 | 2.2 | 2.0 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 1.8 | 1.9 |

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|---|---|---|---|---|---|---|
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 2.7 | 2.2 |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 0.2 | 0.5 |
| Motion picture and sound recording industries | 5121-5122 | -2.88 | 62.5 | 60.7 | 0.0 | 0.0 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | -6.64 | 201.7 | 188.3 | 0.9 | 0.7 |
| Information services and data processing services | 5181-5191 | 6.52 | 53.7 | 57.2 | 0.2 | 0.0 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 0.5 | 0.2 |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 0.0 | 0.3 |
| Amusement, gambling and recreation industries | 7131-7139 | -0.63 | 205.1 | 203.8 | 0.7 | 0.6 |
| Accommodation and food services | 7211-7224 | 7.96 | 1,011.5 | 1,092.0 | 6.1 | 6.2 |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 1.9 | 2.0 |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 4.2 | 4.2 |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 2.8 | 2.8 |
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 1.0 | 0.8 |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 0.7 | 0.9 |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 0.8 | 0.9 |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 0.4 | 0.2 |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 6.0 | 8.1 |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 3.5 | 4.9 |
| Provincial and territorial public administration | 9120 | 1.77 | 254.6 | 259.1 | 2.2 | 2.6 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 0.3 | 0.6 |

**Non-seasonally adjusted, in thousands**

| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | Canada May-Sepetember-2006 | Canada 2008 | New Brunswick May-Sepetember-2006 | New Brunswick 2008 |
|---|---|---|---|---|---|---|
| **All industries** | | | **16676.0** | **17230.2** | **365.0** | **372.8** |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4054.8 | 4170.7 | 79.5 | 89.8 |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 7.1 | 6.6 |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 3.4 | 2.7 |
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 3.4 | 3.6 |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 0.0 | 0.0 |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 0.0 | 0.0 |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | 5.75 | 332.0 | 351.1 | 9.4 | 13.2 |
| Forestry and logging with support activities | 1131-1133, 1153 | -7.94 | 56.7 | 52.2 | 4.1 | 5.9 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 1.8 | 3.4 |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 3.5 | 3.9 |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 0.9 | 0.8 |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | 18.53 | 68.0 | 80.6 | 2.0 | 2.0 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 0.6 | 1.1 |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 2.9 | 5.1 |
| Construction | 2361-2389 | 21.36 | 1079.2 | 1309.7 | 21.9 | 25.0 |

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|---|---|---|---|---|---|---|
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 9.9 | 11.3 |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 12.0 | 13.7 |
| Manufacturing | 3111-3399 | -6.51 | 2150.2 | 2010.3 | 38.3 | 39.9 |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 11.5 | 14.4 |
| Beverage and tobacco product manufacturing | 3121-3122 | 30.40 | 35.2 | 45.9 | 1.8 | 1.2 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | -19.29 | 28.0 | 22.6 | 0.6 | 0.0 |
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 0.5 | 0.0 |
| Wood Product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 6.9 | 4.9 |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 4.0 | 3.4 |
| Printing and related support activities | 3231 | 17.97 | 92.4 | 109.0 | 0.6 | 0.7 |
| Petroleum and coal products manufacturing | 3241 | 8.33 | 19.2 | 20.8 | 1.4 | 1.4 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 0.0 | 0.0 |
| Plastics and rubber products manufacturing | 3261-3262 | -25.40 | 130.7 | 97.5 | 0.9 | 0.7 |
| Non-metallic mineral product manufacturing | 3271-3279 | 0.00 | 66.9 | 66.9 | 1.5 | 1.5 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 0.0 | 1.1 |
| Fabricated metal product manufacturing | 3321-3329 | -5.44 | 191.1 | 180.7 | 1.7 | 4.2 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 1.2 | 1.2 |
| Computer and electronic product manufacturing | 3341-3346 | -2.70 | 111.1 | 108.1 | 0.0 | 0.7 |
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 0.0 | 0.0 |
| Transportation equipment manufacturing | 3361-3369 | -12.86 | 312.5 | 272.3 | 1.2 | 0.0 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 0.7 | 0.0 |
| Other transportation equipment manufacturing | 3364-3369 | 4.38 | 79.9 | 83.4 | 0.5 | 0.0 |
| Furniture and related product manufacturing | 3371-3379 | 5.49 | 103.9 | 109.6 | 1.3 | 1.0 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 2.3 | 1.9 |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1317.9 | 1182.4 | 16.5 | 17.1 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 21.8 | 22.8 |
| Services-producing sector | 41 and over | 3.47 | 12621.2 | 13059.5 | 285.5 | 283.0 |
| Trade | 4111-4543 | -1.24 | 2665.5 | 2632.4 | 58.4 | 59.4 |
| Wholesale trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 10.4 | 10.3 |
| Farm product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 0.0 | 0.0 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 0.0 | 0.5 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 0.9 | 1.4 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 0.0 | 0.8 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 1.1 | 1.3 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 1.6 | 1.2 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 3.8 | 3.8 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 2.3 | 1.2 |
| Retail trade | 4411-4543 | -2.13 | 2032.4 | 1989.2 | 48.0 | 49.1 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 6.7 | 8.3 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 1.3 | 1.2 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 1.1 | 0.6 |
| Building material and garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 2.5 | 3.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 15.1 | 12.8 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 3.6 | 5.3 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 2.6 | 2.7 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 3.2 | 2.5 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 1.3 | 2.1 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 6.3 | 5.7 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 2.4 | 2.6 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 1.9 | 1.6 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 20.1 | 22.4 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 19.7 | 21.7 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 0.0 | 0.5 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 0.0 | 1.5 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 0.5 | 0.0 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 9.5 | 9.6 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 1.8 | 0.8 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.0 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 1.5 | 2.4 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 2.9 | 3.9 |
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 2.6 | 3.0 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 0.0 | 0.7 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1056.4 | 1058.7 | 16.7 | 16.5 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 6.3 | 6.8 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 0.6 | 1.0 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 4.1 | 4.4 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 3.6 | 3.2 |
| Rental and leasing services and owners and lessors of other non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 2.1 | 1.1 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1107.9 | 1184.7 | 14.2 | 15.7 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 2.4 | 1.9 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 1.9 | 1.4 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 4.3 | 4.3 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 2.7 | 3.6 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 1.2 | 1.9 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 0.0 | 0.7 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 1.2 | 1.8 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 22.1 | 19.5 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 0.7 | 0.6 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 13.0 | 9.5 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 1.1 | 0.5 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 2.3 | 1.9 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 3.8 | 5.2 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 0.5 | 0.9 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 0.8 | 0.9 |
| Educational services | 6111-6117 | 1.13 | 1179.3 | 1192.6 | 29.2 | 26.4 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 20.6 | 16.2 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 1.6 | 2.4 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 4.6 | 5.6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Other schools and educational Support | | 6114-6117 | 2.27 | 101.1 | 103.4 | 2.4 | 2.2 |
| Health care and social assistance | 6211-6244 | 8.29 | 1,780.3 | 1,927.9 | 44.9 | 49.9 | |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 7.6 | 8.1 | |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 20.1 | 19.9 | |
| Nursing and residential care facilities | | 6230 | 12.05 | 307.9 | 345.0 | 7.3 | 12.2 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 9.9 | 9.7 | |
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 11.3 | 10.0 | |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 1.0 | 1.2 | |
| Motion picture and sound recording industries | | 5121-5122 | -2.88 | 62.5 | 60.7 | 0.7 | 0.5 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | | -6.64 | 201.7 | 188.3 | 3.7 | 2.9 |
| Information services and data processing services | | 5181-5191 | 6.52 | 53.7 | 57.2 | 1.0 | 0.0 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 1.3 | 0.8 | |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 1.0 | 1.3 | |
| Amusement, gambling and recreation industries | | 7131-7139 | -0.63 | 205.1 | 203.8 | 2.6 | 2.9 |
| Accommodation and food services | 7211-7224 | 7.96 | 1011.5 | 1092.0 | 28.5 | 22.0 | |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 4.7 | 4.4 | |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 23.8 | 17.6 | |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 17.8 | 14.6 | |
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 7.2 | 6.0 | |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 4.0 | 3.6 | |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 4.6 | 2.7 | |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 2.0 | 2.2 | |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 22.4 | 26.7 | |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 10.1 | 12.1 | |
| Provincial and territorial public administration | | 9120 | 1.77 | 254.6 | 259.1 | 7.9 | 11.6 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 4.4 | 3.0 | |

**Non-seasonally adjusted, in thousands**

| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | Canada May-Sepetember- 2006 | Canada 2008 | Quebec May-Sepetember- 2006 | Quebec 2008 | |
|---|---|---|---|---|---|---|---|
| **All industries** | | | **16676.0** | **17230.2** | **3789.4** | **3917.5** | |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4054.8 | 4170.7 | 916.6 | 925.0 | |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 70.8 | 61.0 | |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 25.7 | 19.7 | |
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 42.3 | 37.9 | |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 0.0 | 0.0 | |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 1.9 | 2.9 | |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | | 5.75 | 332.0 | 351.1 | 36.5 | 34.5 |
| Forestry and logging with support activities | | 1131-1133, 1153 | -7.94 | 56.7 | 52.2 | 12.7 | 15.9 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 3.2 | 1.5 | |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 20.6 | 17.1 | |

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|---|---|---|---|---|---|---|
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 1.6 | 0.0 |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | 18.53 | 68.0 | 80.6 | 15.9 | 13.9 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 3.1 | 3.3 |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 31.1 | 32.0 |
| Construction | 2361-2389 | 21.36 | 1079.2 | 1309.7 | 193.2 | 240.9 |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 64.6 | 97.7 |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 128.5 | 143.2 |
| Manufacturing | 3111-3399 | -6.51 | 2150.2 | 2010.3 | 585.0 | 556.6 |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 58.7 | 66.3 |
| Beverage and tobacco product manufacturing | 3121-3122 | 30.40 | 35.2 | 45.9 | 8.7 | 17.0 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | -19.29 | 28.0 | 22.6 | 14.8 | 9.8 |
| Clothing manufacturing and leather and Allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 29.1 | 28.4 |
| Wood product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 65.4 | 41.6 |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 31.9 | 32.7 |
| Printing and related support activities | 3231 | 17.97 | 92.4 | 109.0 | 28.4 | 28.8 |
| Petroleum and coal products manufacturing | 3241 | 8.33 | 19.2 | 20.8 | 3.6 | 5.1 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 25.7 | 34.1 |
| Plastics and rubber products manufacturing | 3261-3262 | -25.40 | 130.7 | 97.5 | 35.8 | 25.8 |
| Non-metallic mineral product manufacturing | 3271-3279 | 0.00 | 66.9 | 66.9 | 20.2 | 17.3 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 31.4 | 28.6 |
| Fabricated metal product manufacturing | 3321-3329 | -5.44 | 191.1 | 180.7 | 48.0 | 41.7 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 23.4 | 25.7 |
| Computer and electronic product manufacturing | 3341-3346 | -2.70 | 111.1 | 108.1 | 24.9 | 20.3 |
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 21.7 | 15.8 |
| Transportation equipment manufacturing | 3361-3369 | -12.86 | 312.5 | 272.3 | 55.4 | 60.1 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 17.8 | 16.4 |
| Other transportation equipment manufacturing | 3364-3369 | 4.38 | 79.9 | 83.4 | 37.5 | 43.7 |
| Furniture and related product manufacturing | 3371-3379 | 5.49 | 103.9 | 109.6 | 38.5 | 38.1 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 19.7 | 19.4 |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1317.9 | 1182.4 | 348.4 | 308.7 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 236.6 | 248.0 |
| Services-producing sector | 41 and over | 3.47 | 12621.2 | 13059.5 | 2872.8 | 2992.5 |
| Trade | 4111-4543 | -1.24 | 2665.5 | 2632.4 | 615.3 | 612.3 |
| Wholesale trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 139.7 | 147.2 |
| Farm product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 0.0 | 2.5 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 0.0 | 2.9 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 26.4 | 28.0 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 21.8 | 21.7 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 12.5 | 9.4 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 25.4 | 20.1 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 28.7 | 37.4 |
| Miscellaneous wholesaler-distributors and who lesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 23.8 | 25.3 |

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|---|---|---|---|---|---|---|
| Retail trade | 4411-4543 | -2.13 | 2032.4 | 1989.2 | 475.6 | 465.1 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 47.0 | 49.5 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 25.4 | 22.9 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 11.9 | 15.4 |
| Building material and garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 39.7 | 40.7 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 117.2 | 116.9 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 45.8 | 45.7 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 16.5 | 14.9 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 73.7 | 52.9 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 24.0 | 18.7 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 49.1 | 51.4 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 16.2 | 24.8 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 9.1 | 11.3 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 171.4 | 182.7 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 168.2 | 177.5 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 10.1 | 9.7 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 9.5 | 8.3 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 1.5 | 0.0 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 58.5 | 65.3 |
| Transit and Ground Passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 26.4 | 35.3 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.0 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 27.8 | 28.0 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 14.9 | 14.7 |
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 19.5 | 15.1 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 3.2 | 5.2 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1056.4 | 1058.7 | 230.7 | 230.0 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 97.0 | 91.0 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 18.9 | 21.2 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 54.4 | 67.9 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 39.0 | 33.9 |
| Rental and leasing services and owners and lessors of other Non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 21.4 | 15.9 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1107.9 | 1184.7 | 240.1 | 260.8 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 22.0 | 30.5 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 29.9 | 27.2 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 47.8 | 63.1 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 68.2 | 58.6 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 36.9 | 43.1 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 20.3 | 21.2 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 15.0 | 17.0 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 135.4 | 140.7 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 21.2 | 22.1 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 14.0 | 16.6 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 12.5 | 7.9 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 18.4 | 17.3 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 52.2 | 63.7 |

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|---|---|---|---|---|---|---|---|
| Management of enterprises and other administrative services | 5511, 5611-5612, 561913.25 | | 45.3 | 51.3 | 10.0 | 8.1 | |
| Waste management and remediation services | | 5621-5629 | 3.16 | 34.8 | 35.9 | 7.1 | 5.0 |
| Educational services | 6111-6117 | 1.13 | 1179.3 | 1192.6 | 265.0 | 254.7 | |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 155.8 | 158.1 | |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 35.9 | 26.3 | |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 56.7 | 52.4 | |
| Other schools and educational support | | 6114-6117 | 2.27 | 101.1 | 103.4 | 16.6 | 17.8 |
| Health care and social assistance | 6211-6244 | 8.29 | 1780.3 | 1927.9 | 453.0 | 480.9 | |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 68.7 | 81.0 | |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 170.9 | 170.0 | |
| Nursing and residential care facilities | | 6230 | 12.05 | 307.9 | 345.0 | 61.5 | 84.9 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 151.9 | 145.0 | |
| Information, culture and recreation | 5111-5191, 7111-7139-0.95 | | 760.5 | 753.3 | 164.0 | 178.1 | |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 20.4 | 18.7 | |
| Motion picture and sound recording industries | | 5121-5122 | -2.88 | 62.5 | 60.7 | 17.5 | 16.7 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | | -6.64 | 201.7 | 188.3 | 44.1 | 43.4 |
| Information services and data processing services | | 5181-5191 | 6.52 | 53.7 | 57.2 | 10.8 | 7.6 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 18.6 | 33.1 | |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 8.5 | 11.4 | |
| Amusement, gambling and recreation industries | | 7131-7139 | -0.63 | 205.1 | 203.8 | 44.0 | 47.1 |
| Accommodation and food services | 7211-7224 | 7.96 | 1011.5 | 1092.0 | 212.3 | 257.2 | |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 27.8 | 40.3 | |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 184.5 | 216.9 | |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 153.2 | 173.0 | |
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 55.0 | 64.3 | |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 46.6 | 59.6 | |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 44.9 | 38.4 | |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 6.6 | 10.7 | |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 232.3 | 222.0 | |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 78.3 | 83.9 | |
| Provincial and territorial public administration | | 9120 | 1.77 | 254.6 | 259.1 | 74.1 | 74.6 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 79.9 | 63.4 | |

**Non-seasonally adjusted, in thousands**

| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | Canada May-Sepetember- 2006 | Canada 2008 | Ontario May-Sepetember- 2006 | Ontario 2008 |
|---|---|---|---|---|---|---|
| **All industries** | | | **16,676.0** | **17,230.2** | **6,582.9** | **6718.9** |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4,054.8 | 4,170.7 | 1,623.9 | 1560.6 |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 104.8 | 90.5 |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 46.5 | 42.6 |

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|---|---|---|---|---|---|---|
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 47.8 | 39.2 |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 6.7 | 6.0 |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 3.7 | 2.8 |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | 5.75 | 332.0 | 351.1 | 41.1 | 39.6 |
| Forestry and logging with support activities | 1131-1133, 1153 | -7.94 | 56.7 | 52.2 | 11.5 | 8.9 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 0.0 | 0.0 |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 28.6 | 30.5 |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 0.0 | 2.3 |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | 18.53 | 68.0 | 80.6 | 21.7 | 22.2 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 6.2 | 6.1 |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 47.8 | 63.6 |
| Construction | 2361-2389 | 21.36 | 1,079.2 | 1,309.7 | 409.7 | 452.4 |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 153.2 | 176.4 |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 256.5 | 276.1 |
| Manufacturing | 3111-3399 | -6.51 | 2,150.2 | 2,010.3 | 1,020.5 | 914.5 |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 97.9 | 105.1 |
| Beverage and tobacco product manufacturing | 3121-3122 | 30.40 | 35.2 | 45.9 | 15.1 | 15.9 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | -19.29 | 28.0 | 22.6 | 9.5 | 8.3 |
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 32.5 | 13.0 |
| Wood product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 39.5 | 27.3 |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 30.3 | 33.8 |
| Printing and related support activities | 3231 | 17.97 | 92.4 | 109.0 | 44.0 | 53.9 |
| Petroleum and coal products manufacturing | 3241 | 8.33 | 19.2 | 20.8 | 7.6 | 5.2 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 48.5 | 58.9 |
| Plastics and rubber products manufacturing | 3261-3262 | -25.40 | 130.7 | 97.5 | 71.3 | 49.7 |
| Non-metallic mineral product manufacturing | 3271-3279 | 0.00 | 66.9 | 66.9 | 26.5 | 24.9 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 45.7 | 34.2 |
| Fabricated metal product manufacturing | 3321-3329 | -5.44 | 191.1 | 180.7 | 98.3 | 81.9 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 62.5 | 46.8 |
| Computer and electronic product manufacturing | 3341-3346 | -2.70 | 111.1 | 108.1 | 65.8 | 69.8 |
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 19.8 | 16.2 |
| Transportation equipment manufacturing | 3361-3369 | -12.86 | 312.5 | 272.3 | 223.1 | 182.6 |
| Motor vehicle, body, Trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 196.3 | 158.8 |
| Other transportation equipment manufacturing | 3364-3369 | 4.38 | 79.9 | 83.4 | 26.8 | 23.8 |
| Furniture and related product manufacturing | 3371-3379 | 5.49 | 103.9 | 109.6 | 40.3 | 43.3 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 42.5 | 43.6 |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1317.9 | 1182.4 | 663.9 | 570.8 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 356.6 | 343.7 |
| Services-producing sector | 41 and over | 3.47 | 12621.2 | 13059.5 | 4958.9 | 5158.3 |
| Trade | 4111-4543 | -1.24 | 2665.5 | 2632.4 | 1047.6 | 1012.4 |
| Wholesale trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 263.7 | 240.6 |
| Farm product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 4.7 | 4.0 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 4.2 | 1.5 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 29.4 | 31.1 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 41.5 | 34.9 |

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|---|---|---|---|---|---|---|
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 31.0 | 20.7 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 31.9 | 33.6 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 74.2 | 66.3 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 46.8 | 48.5 |
| Retail trade | 4411-4543 | -2.13 | 2032.4 | 1989.2 | 783.9 | 771.8 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 71.6 | 73.4 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 23.9 | 29.2 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 32.9 | 33.8 |
| Building material and Garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 48.2 | 51.9 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 200.3 | 174.9 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 53.1 | 56.8 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 17.7 | 22.7 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 83.9 | 88.2 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 32.0 | 39.8 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 143.2 | 126.0 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 56.0 | 57.5 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 21.1 | 17.8 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 283.9 | 352.3 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 270.0 | 322.5 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 10.5 | 25.3 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 13.2 | 12.2 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 0.0 | 0.0 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 87.9 | 117.9 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 60.9 | 62.5 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.0 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 37.6 | 36.8 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 30.5 | 38.5 |
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 28.5 | 28.1 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 13.9 | 29.8 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1056.4 | 1058.7 | 488.2 | 464.7 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 191.9 | 190.5 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 58.5 | 57.1 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 108.0 | 107.0 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 106.0 | 84.5 |
| Rental and leasing services and owners and lessors of other non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 23.8 | 25.6 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1107.9 | 1184.7 | 473.6 | 491.8 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 65.2 | 61.3 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 52.1 | 50.3 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 93.4 | 111.0 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 118.6 | 142.2 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 75.0 | 72.8 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 31.8 | 23.9 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 37.6 | 30.3 |

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|---|---|---|---|---|---|---|
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 298.4 | 302.0 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 42.0 | 52.3 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 70.6 | 48.7 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 22.0 | 22.3 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 40.3 | 24.8 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 89.0 | 113.5 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 24.2 | 27.3 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 10.2 | 13.0 |
| Educational services | 6111-6117 | 1.13 | 1179.3 | 1192.6 | 451.6 | 483.0 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 301.9 | 306.7 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 31.2 | 28.2 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 78.0 | 101.1 |
| Other schools and educational support | 6114-6117 | 2.27 | 101.1 | 103.4 | 40.6 | 46.9 |
| Health care and social assistance | 6211-6244 | 8.29 | 1780.3 | 1927.9 | 622.0 | 709.3 |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 167.3 | 201.8 |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 184.9 | 219.3 |
| Nursing and residential care facilities | 6230 | 12.05 | 307.9 | 345.0 | 131.4 | 127.7 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 138.5 | 160.4 |
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 333.0 | 300.9 |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 43.4 | 31.0 |
| Motion picture and sound recording industries | 5121-5122 | -2.88 | 62.5 | 60.7 | 27.0 | 24.4 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | -6.64 | 201.7 | 188.3 | 89.8 | 73.6 |
| Information services and data processing services | 5181-5191 | 6.52 | 53.7 | 57.2 | 28.6 | 34.3 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 50.6 | 54.7 |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 12.2 | 10.9 |
| Amusement, gambling and recreation industries | 7131-7139 | -0.63 | 205.1 | 203.8 | 81.4 | 72.1 |
| Accommodation and food services | 7211-7224 | 7.96 | 1011.5 | 1092.0 | 373.2 | 401.7 |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 67.4 | 59.9 |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 305.9 | 341.7 |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 270.7 | 284.7 |
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 85.4 | 86.8 |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 91.6 | 89.3 |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 69.1 | 73.8 |
| Private households | 8141 | 26.94 | 56.8 | **72.1** | 24.7 | 34.9 |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 316.7 | 355.6 |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 133.4 | 148.5 |
| Provincial and territorial public administration | 9120 | 1.77 | 254.6 | 259.1 | 75.9 | 81.2 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 107.4 | 125.9 |
| **All industries** | | | **16676.0** | **17230.2** | **596.5** | **607.0** |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4054.8 | 4170.7 | 141.3 | 152.3 |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 29.5 | 31.1 |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 11.5 | 15.0 |
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 14.0 | 14.9 |

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|---|---|---|---|---|---|---|
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 2.8 | 0.7 |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 1.2 | 0.5 |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | 5.75 | 332.0 | 351.1 | 6.2 | 6.6 |
| Forestry and logging with support activities | 1131-1133, 1153 | -7.94 | 56.7 | 52.2 | 0.8 | 0.9 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 0.9 | 0.0 |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 4.6 | 5.4 |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 0.0 | 0.0 |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | 18.53 | 68.0 | 80.6 | 2.3 | 3.4 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 1.9 | 1.6 |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 6.5 | 7.0 |
| Construction | 2361-2389 | 21.36 | 1079.2 | 1309.7 | 32.5 | 41.7 |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 10.1 | 14.0 |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 22.4 | 27.7 |
| Manufacturing | 3111-3399 | -6.51 | 2150.2 | 2010.3 | 66.7 | 66.0 |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 11.1 | 10.5 |
| Beverage and tobacco product manufacturing | 3121-3122 | 30.40 | 35.2 | 45.9 | 0.0 | 2.0 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | -19.29 | 28.0 | 22.6 | 0.7 | 0.5 |
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 4.0 | 3.4 |
| Wood Product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 4.8 | 3.7 |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 2.4 | 1.5 |
| Printing and related Support Activities | 3231 | 17.97 | 92.4 | 109.0 | 4.0 | 4.0 |
| Petroleum and coal products manufacturing | 3241 | 8.33 | 19.2 | 20.8 | 0.0 | 0.0 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 3.4 | 3.3 |
| Plastics and rubber products manufacturing | 3261-3262 | -25.40 | 130.7 | 97.5 | 3.0 | 4.0 |
| Non-metallic mineral product manufacturing | 3271-3279 | 0.00 | 66.9 | 66.9 | 1.2 | 1.6 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 1.3 | 2.3 |
| Fabricated metal product manufacturing | 3321-3329 | -5.44 | 191.1 | 180.7 | 5.6 | 6.8 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 5.7 | 5.0 |
| Computer and electronic product manufacturing | 3341-3346 | -2.70 | 111.1 | 108.1 | 0.9 | 1.4 |
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 1.0 | 1.2 |
| Transportation equipment manufacturing | 3361-3369 | -12.86 | 312.5 | 272.3 | 8.7 | 7.9 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 5.5 | 4.3 |
| Other transportation equipment manufacturing | 3364-3369 | 4.38 | 79.9 | 83.4 | 3.3 | 3.6 |
| Furniture and related product manufacturing | 3371-3379 | 5.49 | 103.9 | 109.6 | 5.9 | 5.3 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 2.9 | 1.7 |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1317.9 | 1182.4 | 37.9 | 36.8 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 28.8 | 29.2 |
| Services-producing sector | 41 and over | 3.47 | 12621.2 | 13059.5 | 455.1 | 454.7 |
| Trade | 4111-4543 | -1.24 | 2665.5 | 2632.4 | 90.8 | 87.5 |
| Wholesale Trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 20.1 | 19.8 |
| Farm Product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 1.6 | 1.8 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 0.0 | 0.0 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 2.4 | 2.4 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 1.7 | 1.1 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 1.5 | 2.1 |

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|---|---|---|---|---|---|---|
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 2.1 | 1.9 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 6.6 | 5.9 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 3.8 | 4.2 |
| Retail trade | 4411-4543 | -2.13 | 2032.4 | 1989.2 | 70.7 | 67.7 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 9.7 | 9.9 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 2.9 | 3.2 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 2.4 | 2.7 |
| Building material and garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 6.5 | 4.4 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 17.8 | 17.0 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 3.5 | 4.3 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 2.9 | 3.8 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 6.1 | 3.8 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 2.9 | 3.5 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 11.1 | 9.4 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 4.0 | 4.1 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 0.9 | 1.6 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 37.4 | 35.4 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 35.9 | 34.3 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 3.0 | 4.7 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 5.0 | 2.3 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 0.0 | 0.0 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 17.9 | 13.7 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 3.0 | 3.6 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.0 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 2.2 | 1.7 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 2.8 | 5.2 |
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 1.4 | 3.0 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 1.6 | 1.0 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1056.4 | 1058.7 | 34.3 | 36.6 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 10.8 | 9.0 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 5.9 | 4.0 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 11.5 | 14.3 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 5.1 | 7.6 |
| Rental and leasing services and owners and lessors of other non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 1.1 | 1.7 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1107.9 | 1184.7 | 23.1 | 23.4 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 1.5 | 1.8 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 3.2 | 2.8 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 5.7 | 3.8 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 2.9 | 4.8 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 4.0 | 5.6 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 2.4 | 1.6 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 3.3 | 3.0 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 19.0 | 17.9 |

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|---|---|---|---|---|---|---|
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 1.6 | 1.3 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 5.2 | 4.6 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 0.7 | 1.9 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 2.1 | 2.4 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 7.8 | 6.2 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 0.6 | 0.5 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 1.0 | 1.0 |
| Educational services | 6111-6117 | 1.13 | 1179.3 | 1192.6 | 47.7 | 46.2 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 36.3 | 31.9 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 1.5 | 3.2 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 6.2 | 8.6 |
| Other schools and educational Support | 6114-6117 | 2.27 | 101.1 | 103.4 | 3.7 | 2.5 |
| Health care and social assistance | 6211-6244 | 8.29 | 1780.3 | 1927.9 | 77.9 | 86.8 |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 14.6 | 16.7 |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 31.7 | 36.6 |
| Nursing and residential care facilities | 6230 | 12.05 | 307.9 | 345.0 | 15.4 | 18.2 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 16.2 | 15.3 |
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 24.3 | 22.2 |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 2.7 | 2.6 |
| Motion picture and sound recording industries | 5121-5122 | -2.88 | 62.5 | 60.7 | 0.9 | 1.2 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | -6.64 | 201.7 | 188.3 | 7.3 | 7.7 |
| Information services and data processing services | 5181-5191 | 6.52 | 53.7 | 57.2 | 1.0 | 0.8 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 2.9 | 2.2 |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 1.3 | 0.7 |
| Amusement, gambling and recreation industries | 7131-7139 | -0.63 | 205.1 | 203.8 | 8.3 | 7.0 |
| Accommodation and food services | 7211-7224 | 7.96 | 1011.5 | 1092.0 | 38.9 | 35.5 |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 8.4 | 7.7 |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 30.5 | 27.8 |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 26.3 | 28.8 |
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 9.3 | 10.5 |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 7.0 | 8.7 |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 7.4 | 8.5 |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 2.6 | 1.0 |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 35.4 | 34.5 |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 14.9 | 14.4 |
| Provincial and territorial public administration | 9120 | 1.77 | 254.6 | 259.1 | 12.6 | 10.6 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 8.0 | 9.5 |

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|---|---|---|---|---|---|---|
| | | | **Non-seasonally adjusted, in thousands** | | | |
| | | | **Canada** | | **Saskatchewan** | |
| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | May-Sepetember-2006 | 2008 | May-Sepetember-2006 | 2008 |

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|---|---|---|---|---|---|---|---|
| **All industries** | | | **16,676.0** | **17,230.2** | **496.1** | **522.5** | |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4054.8 | 4170.7 | 136.2 | 152.1 | |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 52.4 | 47.2 | |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 27.0 | 28.4 | |
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 19.2 | 14.7 | |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 4.6 | 2.9 | |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 1.6 | 1.2 | |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | | 5.75 | 332.0 | 351.1 | 20.3 | 25.7 |
| Forestry and logging with support activities | 1131-1133, 1153 | | -7.94 | 56.7 | 52.2 | 1.0 | 0.8 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 0.0 | 0.0 | |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 19.3 | 24.8 | |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 4.2 | 3.3 | |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | | 18.53 | 68.0 | 80.6 | 6.5 | 9.5 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 8.6 | 11.9 | |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 4.6 | 5.8 | |
| Construction | 2361-2389 | 21.36 | 1079.2 | 1309.7 | 30.7 | 40.5 | |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 14.5 | 17.4 | |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 16.2 | 23.1 | |
| Manufacturing | 3111-3399 | -6.51 | 2150.2 | 2010.3 | 28.1 | 33.0 | |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 5.5 | 6.8 | |
| Beverage and tobacco product manufacturing | 3121-3122 | | 30.40 | 35.2 | 45.9 | 0.0 | 0.6 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | | -19.29 | 28.0 | 22.6 | 0.5 | 0.5 |
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 0.0 | 0.0 | |
| Wood product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 2.2 | 2.1 | |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 0.0 | 0.7 | |
| Printing and related support activities | 3231 | | 17.97 | 92.4 | 109.0 | 0.7 | 1.9 |
| Petroleum and coal products manufacturing | 3241 | | 8.33 | 19.2 | 20.8 | 0.7 | 0.7 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 1.8 | 1.4 | |
| Plastics and rubber products manufacturing | 3261-3262 | | -25.40 | 130.7 | 97.5 | 0.5 | 0.6 |
| Non-metallic mineral product manufacturing | 3271-3279 | | 0.00 | 66.9 | 66.9 | 0.0 | 2.2 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 1.9 | 1.4 | |
| Fabricated metal product manufacturing | 3321-3329 | | -5.44 | 191.1 | 180.7 | 2.9 | 4.7 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 3.6 | 6.0 | |
| Computer and electronic product manufacturing | 3341-3346 | | -2.70 | 111.1 | 108.1 | 1.2 | 0.5 |
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 0.0 | 0.0 | |
| Transportation equipment manufacturing | 3361-3369 | | -12.86 | 312.5 | 272.3 | 3.1 | 1.6 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 2.8 | 1.6 | |
| Other transportation equipment manufacturing | 3364-3369 | | 4.38 | 79.9 | 83.4 | 0.0 | 0.0 |
| Furniture and related product manufacturing | 3371-3379 | | 5.49 | 103.9 | 109.6 | 1.3 | 0.0 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 0.6 | 0.8 | |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1317.9 | 1182.4 | 17.5 | 19.9 | |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 10.6 | 13.1 | |
| Services-producing sector | 41 and over | 3.47 | 12621.2 | 13059.5 | 359.9 | 370.4 | |
| Trade | 4111-4543 | -1.24 | 2665.5 | 2632.4 | 79.2 | 82.4 | |
| Wholesale Trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 18.8 | 19.2 | |
| Farm product wholesaler-distributors | 4111 | | 36.05 | 8.6 | 11.7 | 1.0 | 0.7 |

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|---|---|---|---|---|---|---|
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 0.6 | 0.0 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 2.4 | 1.6 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 0.0 | 0.9 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 1.4 | 2.6 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 2.7 | 2.5 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 6.4 | 7.0 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 3.8 | 3.7 |
| Retail trade | 4411-4543 | -2.13 | 2032.4 | 1989.2 | 60.4 | 63.2 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 7.6 | 10.4 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 2.0 | 1.6 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 1.8 | 1.6 |
| Building material and garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 4.0 | 4.2 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 13.6 | 15.0 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 3.6 | 3.1 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 4.8 | 3.5 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 3.7 | 5.7 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 2.7 | 1.9 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 10.4 | 11.3 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 4.0 | 3.1 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 2.1 | 1.9 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 25.1 | 21.7 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 21.8 | 20.0 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 0.0 | 0.0 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 1.7 | 2.0 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 0.0 | 0.0 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 9.9 | 11.0 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 3.2 | 2.1 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.5 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 2.0 | 0.9 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 1.5 | 2.2 |
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 2.7 | 1.1 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 3.3 | 1.7 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1056.4 | 1058.7 | 25.4 | 27.4 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 10.3 | 10.2 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 2.7 | 2.4 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 5.9 | 7.5 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 4.7 | 5.4 |
| Rental and leasing services and owners and lessors of other non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 1.7 | 1.9 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1107.9 | 1184.7 | 19.2 | 21.8 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 3.2 | 2.6 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 3.1 | 4.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 4.4 | 5.4 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 2.3 | 3.0 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 4.0 | 4.7 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 1.1 | 0.9 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 1.2 | 0.7 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 13.7 | 11.7 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 0.6 | 0.0 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 3.0 | 2.0 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 0.7 | 0.0 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 2.0 | 2.2 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 5.8 | 5.4 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 0.6 | 0.0 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 1.1 | 1.5 |
| Educational services | 6111-6117 | 1.13 | 1179.3 | 1192.6 | 40.2 | 40.4 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 28.4 | 27.7 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 2.4 | 2.1 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 7.3 | 8.6 |
| Other schools and educational support | 6114-6117 | 2.27 | 101.1 | 103.4 | 2.0 | 1.9 |
| Health care and social assistance | 6211-6244 | 8.29 | 1780.3 | 1927.9 | 60.0 | 66.1 |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 9.1 | 10.5 |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 27.7 | 29.9 |
| Nursing and residential care facilities | 6230 | 12.05 | 307.9 | 345.0 | 12.8 | 12.7 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 10.4 | 13.0 |
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 20.7 | 18.0 |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 2.7 | 2.0 |
| Motion picture and sound recording industries | 5121-5122 | -2.88 | 62.5 | 60.7 | 0.7 | 0.6 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | -6.64 | 201.7 | 188.3 | 6.5 | 7.2 |
| Information services and data processing services | 5181-5191 | 6.52 | 53.7 | 57.2 | 1.2 | 1.5 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 1.7 | 1.5 |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 1.1 | 0.0 |
| Amusement, gambling and recreation industries | 7131-7139 | -0.63 | 205.1 | 203.8 | 6.9 | 5.0 |
| Accommodation and food services | 7211-7224 | 7.96 | 1011.5 | 1092.0 | 28.9 | 30.1 |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 6.4 | 7.7 |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 22.5 | 22.4 |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 19.8 | 21.8 |
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 7.0 | 9.2 |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 6.0 | 6.0 |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 6.3 | 5.9 |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 0.5 | 0.7 |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 27.6 | 29.0 |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 9.2 | 11.4 |
| Provincial and territorial public administration | 9120 | 1.77 | 254.6 | 259.1 | 11.5 | 10.1 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 6.9 | 7.4 |

**Non-seasonally adjusted, in thousands**

| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | Canada May-Sepetember- 2006 | Canada May-Sepetember- 2008 | Alberta May-Sepetember- 2006 | Alberta May-Sepetember- 2008 | |
|---|---|---|---|---|---|---|---|
| **All industries** | | | **16,676.0** | **17230.2** | **1899.2** | **2020.2** | |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4,054.8 | 4170.7 | 526.6 | 606.8 | |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 57.7 | 68.1 | |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 16.2 | 18.1 | |
| Animal production | 1121-1129 | -1.95 | 1,74.6 | 171.2 | 29.6 | 41.0 | |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 10.2 | 4.7 | |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 1.7 | 4.4 | |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | | 5.75 | 332.0 | 351.1 | 139.2 | 153.7 |
| Forestry and logging with support activities | 1131-1133, 1153 | | -7.94 | 56.7 | 52.2 | 4.1 | 3.5 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 0.0 | 0.0 | |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 134.8 | 149.9 | |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 70.6 | 68.0 | |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | | 18.53 | 68.0 | 80.6 | 3.6 | 7.3 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 60.7 | 74.6 | |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 17.0 | 18.2 | |
| Construction | 2361-2389 | 21.36 | 1,079.2 | 1309.7 | 173.8 | 214.0 | |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 62.5 | 86.2 | |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 111.3 | 127.8 | |
| Manufacturing | 3111-3399 | -6.51 | 2,150.2 | 2010.3 | 138.8 | 152.7 | |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 23.4 | 23.9 | |
| Beverage and tobacco product manufacturing | 3121-3122 | | 30.40 | 35.2 | 45.9 | 1.8 | 1.8 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | | -19.29 | 28.0 | 22.6 | 0.0 | 0.0 |
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 2.0 | 0.0 | |
| Wood product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 13.2 | 13.7 | |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 3.0 | 3.3 | |
| Printing and related support activities | 3231 | | 17.97 | 92.4 | 109.0 | 4.6 | 7.0 |
| Petroleum and coal products manufacturing | 3241 | | 8.33 | 19.2 | 20.8 | 4.2 | 5.2 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 11.0 | 9.5 | |
| Plastics and rubber products manufacturing | 3261-3262 | | -25.40 | 130.7 | 97.5 | 8.1 | 6.5 |
| Non-metallic mineral product manufacturing | 3271-3279 | | 0.00 | 66.9 | 66.9 | 7.0 | 7.8 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 3.6 | 6.0 | |
| Fabricated metal product manufacturing | 3321-3329 | | -5.44 | 191.1 | 180.7 | 18.2 | 19.4 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 11.8 | 17.0 | |
| Computer and electronic product manufacturing | 3341-3346 | | -2.70 | 111.1 | 108.1 | 6.9 | 7.2 |
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 3.2 | 2.7 | |
| Transportation equipment manufacturing | 3361-3369 | | -12.86 | 312.5 | 272.3 | 4.4 | 4.9 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 3.5 | 3.0 | |
| Other transportation equipment manufacturing | 3364-3369 | | 4.38 | 79.9 | 83.4 | 0.0 | 1.9 |
| Furniture and related product manufacturing | 3371-3379 | | 5.49 | 103.9 | 109.6 | 4.6 | 7.4 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 7.4 | 7.8 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1317.9 | 1182.4 | 80.2 | 94.0 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 58.6 | 58.7 |
| Services-producing sector | 41 and over | 3.47 | 12,621.2 | 13059.5 | 1372.6 | 1413.4 |
| Trade | 4111-4543 | -1.24 | 2,665.5 | 2632.4 | 282.6 | 311.4 |
| Wholesale trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 71.6 | 87.5 |
| Farm product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 0.0 | 0.0 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 2.7 | 2.8 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 6.2 | 8.9 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 3.3 | 5.0 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 6.9 | 7.7 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 12.3 | 12.6 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 29.3 | 36.9 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 10.5 | 12.4 |
| Retail trade | 4411-4543 | -2.13 | 2,032.4 | 1989.2 | 211.0 | 223.9 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 28.1 | 34.1 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 9.5 | 10.8 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 11.0 | 9.5 |
| Building material and garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 14.8 | 13.1 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 52.4 | 55.7 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 12.4 | 14.9 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 7.5 | 9.2 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 15.1 | 18.2 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 13.2 | 11.2 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 31.0 | 30.7 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 10.9 | 12.8 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 5.2 | 3.8 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 112.5 | 105.3 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 107.1 | 100.8 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 14.3 | 8.7 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 5.9 | 7.0 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 0.0 | 0.0 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 41.8 | 38.2 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 16.0 | 15.1 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 2.6 | 3.6 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 9.2 | 13.4 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 11.5 | 6.7 |
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 5.4 | 7.5 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 5.4 | 4.6 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1056.4 | 1058.7 | 99.4 | 102.5 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 35.4 | 33.2 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 6.8 | 12.4 |

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|---|---|---|---|---|---|---|
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 21.5 | 22.7 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 24.0 | 17.3 |
| Rental and leasing services and owners and lessors of other Non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 11.6 | 17.0 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1,107.9 | 1,184.7 | 141.6 | 168.0 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 19.6 | 15.5 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 16.9 | 23.0 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 59.5 | 68.0 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 17.8 | 18.1 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 18.4 | 30.1 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 5.9 | 7.1 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 3.6 | 6.2 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 61.1 | 63.4 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 5.1 | 2.8 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 9.8 | 6.0 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 3.3 | 4.8 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 6.5 | 13.7 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 28.9 | 27.9 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 3.8 | 3.1 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 3.7 | 5.2 |
| Educational services | 6111-6117 | 1.13 | 1179.3 | 1192.6 | 133.4 | 130.5 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 79.3 | 81.9 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 17.9 | 15.0 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 26.4 | 22.1 |
| Other schools and educational support | 6114-6117 | 2.27 | 101.1 | 103.4 | 9.9 | 11.5 |
| Health care and social assistance | 6211-6244 | 8.29 | 1,780.3 | 1927.9 | 186.6 | 179.8 |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 47.8 | 45.7 |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 72.4 | 68.8 |
| Nursing and residential care facilities | 6230 | 12.05 | 307.9 | 345.0 | 25.4 | 29.2 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 41.0 | 36.1 |
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 66.7 | 71.0 |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 8.1 | 6.3 |
| Motion picture and sound recording industries | 5121-5122 | -2.88 | 62.5 | 60.7 | 2.7 | 2.2 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | -6.64 | 201.7 | 188.3 | 18.2 | 16.2 |
| Information services and data processing services | 5181-5191 | 6.52 | 53.7 | 57.2 | 4.6 | 4.2 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 9.5 | 11.8 |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 2.4 | 4.9 |
| Amusement, gambling and recreation industries | 7131-7139 | -0.63 | 205.1 | 203.8 | 21.2 | 25.5 |
| Accommodation and food services | 7211-7224 | 7.96 | 1011.5 | 1092.0 | 113.6 | 117.9 |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 29.6 | 22.7 |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 84.0 | 95.2 |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 88.4 | 85.6 |
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 41.2 | 39.7 |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | 235.0 | 22.0 | 25.6 |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 19.2 | 13.5 |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 6.0 | 6.7 |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 86.6 | 78.0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 18.6 | 17.3 |
| Provincial and territorial public administration | 9120 | 1.77 | 254.6 | 259.1 | 28.8 | 27.3 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 39.3 | 33.4 |

**Non-seasonally adjusted, in thousands**

| NAICS 2002 titles: | NAICS 2002 CODES: | Percent change in employment | Canada May-Sepetember-2006 | Canada 2008 | British Columbia May-Sepetember-2006 | British Columbia 2008 |
|---|---|---|---|---|---|---|
| All industries | | | 16676.0 | 17230.2 | 2202.6 | 2315.9 |
| Goods-producing sector | 11, 21, 22,23, 31, 32, 33 | | 4054.8 | 4170.7 | 460.5 | 515.6 |
| Agriculture | 1100-1129, 1151-1152 | | 371.2 | 348.2 | 36.8 | 33.6 |
| Crop production | 1111-1119 | -6.67 | 156.0 | 145.6 | 20.4 | 14.6 |
| Animal production | 1121-1129 | -1.95 | 174.6 | 171.2 | 12.2 | 15.0 |
| Mix farming | 1100 | -41.34 | 28.3 | 16.6 | 2.5 | 1.5 |
| Support activities for agriculture | 1151-1152 | 21.31 | 12.2 | 14.8 | 1.6 | 2.5 |
| Forestry, fishing, mining, oil and gas | 1131-1142,1153, 2100-2131 | 5.75 | 332.0 | 351.1 | 40.6 | 44.8 |
| Forestry and logging with support activities | 1131-1133, 1153 | -7.94 | 56.7 | 52.2 | 19.6 | 12.8 |
| Fishing, hunting and trapping | 1141-1142 | -31.76 | 34.0 | 23.2 | 2.8 | 2.1 |
| Mining and oil and gas extraction | 2100-2131 | 14.26 | 241.3 | 275.7 | 18.2 | 29.9 |
| Oil and gas extraction | 2111 | -0.85 | 82.3 | 81.6 | 3.1 | 2.7 |
| Mining (except oil and gas) and mix mining | 2121-2123, 2100 | 18.53 | 68.0 | 80.6 | 9.1 | 17.4 |
| Support activities for mining and oil and gas extraction | 2131 | 24.73 | 91.0 | 113.5 | 6.0 | 9.8 |
| Utilities | 2211-2213 | 23.98 | 122.2 | 151.5 | 8.1 | 14.5 |
| Construction | 2361-2389 | 21.36 | 1079.2 | 1309.7 | 171.4 | 237.1 |
| Prime contracting | 2361-2379 | 29.93 | 395.6 | 514.0 | 60.2 | 87.8 |
| Trade contracting | 2381-2389 | 16.38 | 683.7 | 795.7 | 111.3 | 149.4 |
| Manufacturing | 3111-3399 | -6.51 | 2150.2 | 2010.3 | 203.7 | 185.5 |
| Food manufacturing | 3111-3119 | 5.56 | 257.0 | 271.3 | 21.5 | 23.9 |
| Beverage and tobacco product manufacturing | 3121-3122 | 30.40 | 35.2 | 45.9 | 4.9 | 5.8 |
| Textile mills and textile product mills | 3131-3133, 3141-3149 | -19.29 | 28.0 | 22.6 | 0.0 | 0.0 |
| Clothing manufacturing and leather and allied product manufacturing | 3151-3159, 3161-3169 | -30.35 | 77.1 | 53.7 | 7.4 | 6.4 |
| Wood Product manufacturing | 3211-3219 | -27.92 | 184.1 | 132.7 | 48.6 | 35.8 |
| Paper manufacturing | 3221-3222 | -4.25 | 94.1 | 90.1 | 18.4 | 11.1 |
| Printing and related support activities | 3231 | 17.97 | 92.4 | 109.0 | 7.3 | 10.6 |
| Petroleum and coal products manufacturing | 3241 | 8.33 | 19.2 | 20.8 | 0.0 | 1.8 |
| Chemical manufacturing | 3251-3259 | 18.56 | 98.6 | 116.9 | 6.5 | 7.8 |
| Plastics and rubber products manufacturing | 3261-3262 | -25.40 | 130.7 | 97.5 | 4.7 | 4.0 |
| Non-metallic mineral product manufacturing | 3271-3279 | 0.00 | 66.9 | 66.9 | 8.3 | 9.4 |
| Primary metal manufacturing | 3311-3315 | -15.52 | 92.8 | 78.4 | 8.0 | 4.4 |
| Fabricated metal product manufacturing | 3321-3329 | -5.44 | 191.1 | 180.7 | 14.0 | 19.2 |
| Machinery manufacturing | 3331-3339 | -8.45 | 117.1 | 107.2 | 8.4 | 4.3 |
| Computer and electronic product manufacturing | 3341-3346 | -2.70 | 111.1 | 108.1 | 10.4 | 5.7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Electrical equipment, appliance and component manufacturing | 3351-3359 | -20.82 | 49.0 | 38.8 | 2.2 | 1.8 |
| Transportation equipment manufacturing | 3361-3369 | -12.86 | 312.5 | 272.3 | 10.6 | 8.7 |
| Motor vehicle, body, trailer and parts manufacturing | 3361-3363 | -18.79 | 232.6 | 188.9 | 5.1 | 4.4 |
| Other transportation equipment manufacturing | 3364-3369 | 4.38 | 79.9 | 83.4 | 5.4 | 4.3 |
| Furniture and related product manufacturing | 3371-3379 | 5.49 | 103.9 | 109.6 | 9.9 | 12.6 |
| Miscellaneous manufacturing | 3391-3399 | -1.90 | 89.4 | 87.7 | 11.6 | 11.6 |
| Durables | 3211-3219, 3271-3279, 3311-3399 | -10.28 | 1317.9 | 1182.4 | 131.9 | 113.3 |
| Non-durables | 3111-3169, 3221-3262 | -0.52 | 832.2 | 827.9 | 71.8 | 72.2 |
| Services-producing sector | 41 and over | 3.47 | 12621.2 | 13059.5 | 1742.0 | 1800.3 |
| Trade | 4111-4543 | -1.24 | 2665.5 | 2632.4 | 362.7 | 343.1 |
| Wholesale Trade | 4111-4191 | 1.60 | 633.1 | 643.2 | 84.3 | 101.3 |
| Farm Product wholesaler-distributors | 4111 | 36.05 | 8.6 | 11.7 | 0.0 | 0.0 |
| Petroleum product wholesaler-distributors | 4121 | -9.91 | 11.1 | 10.0 | 0.0 | 0.0 |
| Food, beverage and tobacco wholesaler-distributors | 4131-4133 | 5.71 | 89.3 | 94.4 | 13.3 | 17.9 |
| Personal and household goods wholesaler-distributors | 4141-4145 | -0.25 | 78.9 | 78.7 | 8.3 | 12.7 |
| Motor vehicle and parts wholesaler-distributors | 4151-4153 | -15.93 | 65.9 | 55.4 | 10.2 | 9.9 |
| Building material and supplies wholesaler-distributors | 4161-4163 | 2.85 | 91.1 | 93.7 | 13.2 | 18.2 |
| Machinery, equipment and supplies wholesaler-distributors | 4171-4179 | 3.67 | 176.9 | 183.4 | 21.7 | 22.3 |
| Miscellaneous wholesaler-distributors and wholesale agents and brokers | 4181-4189, 4191 | 4.04 | 111.3 | 115.8 | 16.1 | 17.8 |
| Retail trade | 4411-4543 | -2.13 | 2032.4 | 1989.2 | 278.5 | 241.8 |
| Motor vehicle and parts dealers | 4411-4413 | 6.89 | 206.0 | 220.2 | 28.0 | 23.4 |
| Furniture and home furnishings stores | 4421-4422 | 1.93 | 82.9 | 84.5 | 15.0 | 10.6 |
| Electronics and appliance stores | 4431 | 5.09 | 72.7 | 76.4 | 9.8 | 9.0 |
| Building material and Garden equipment and supplies dealers | 4441-4442 | 1.79 | 145.2 | 147.8 | 20.9 | 19.0 |
| Food and beverage stores | 4451-4453 | -5.07 | 513.2 | 487.2 | 66.1 | 65.8 |
| Health and personal care stores | 4461 | 5.64 | 150.6 | 159.1 | 21.1 | 17.9 |
| Gasoline stations | 4471 | -1.38 | 72.7 | 71.7 | 14.6 | 10.7 |
| Clothing and clothing accessories stores | 4481-4483 | -8.48 | 221.7 | 202.9 | 28.5 | 25.4 |
| Sporting goods, hobby, book and music stores | 4511-4512 | -2.84 | 95.1 | 92.4 | 15.5 | 11.4 |
| General merchandise stores | 4521-4529 | -6.45 | 292.8 | 273.9 | 25.2 | 25.3 |
| Miscellaneous store retailers | 4531-4539 | -0.94 | 127.7 | 126.5 | 25.4 | 17.0 |
| Non-store retailers | 4541-4543 | -9.32 | 51.5 | 46.7 | 8.3 | 6.3 |
| Transportation and warehousing | 4811-4931 | 9.05 | 806.9 | 879.9 | 122.2 | 129.2 |
| Transportation | 4811-4922 | 7.29 | 771.2 | 827.4 | 114.7 | 120.1 |
| Air transportation | 4811-4812 | 9.32 | 55.8 | 61.0 | 12.9 | 8.4 |
| Rail transportation | 4821 | -0.50 | 39.8 | 39.6 | 3.3 | 5.7 |
| Water transportation | 4831-4832 | -26.90 | 14.5 | 10.6 | 7.0 | 5.3 |
| Truck transportation | 4841-4842 | 13.00 | 268.5 | 303.4 | 34.5 | 40.2 |
| Transit and ground passenger transportation | 4851-4859 | 10.22 | 129.1 | 142.3 | 14.1 | 16.8 |
| Pipeline transportation | 4861-4869 | -19.61 | 5.1 | 4.1 | 0.0 | 0.0 |
| Scenic and sightseeing transportation and support activities for transportation | 4871-4879 , 4881-4889 | 2.21 | 108.6 | 111.0 | 23.1 | 21.9 |
| Postal service | 4911 | 13.54 | 78.3 | 88.9 | 9.4 | 14.7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Couriers and messengers | 4921-4922 | -6.99 | 71.5 | 66.5 | 9.1 | 7.1 |
| Warehousing and storage | 4931 | 47.06 | 35.7 | 52.5 | 7.5 | 9.0 |
| Finance, insurance, real estate and leasing | 5211-5331 | 0.22 | 1056.4 | 1058.7 | 132.3 | 148.9 |
| Monetary authorities-central bank and credit intermediation and related activities | 5211, 5221-5223 | -2.13 | 408.3 | 399.6 | 48.1 | 48.0 |
| Securities, commodity contracts, and other intermediation and related activities | 5231-5239 | 1.15 | 113.0 | 114.3 | 17.5 | 13.2 |
| Insurance carriers and related activities and funds and other financial vehicles | 5241-5242, 5261-5269 | 13.97 | 236.2 | 269.2 | 23.2 | 37.2 |
| Real estate | 5311-5313 | -12.49 | 225.7 | 197.5 | 35.8 | 37.9 |
| Rental and leasing services and owners and lessors of other non-financial assets | 5321-5324, 5331 | 6.69 | 73.2 | 78.1 | 7.7 | 12.6 |
| Professional, scientific and technical services | 5411-5419 | 6.93 | 1107.9 | 1184.7 | 168.0 | 169.6 |
| Legal services | 5411 | 4.69 | 138.6 | 145.1 | 18.9 | 26.3 |
| Accounting and tax preparation | 5412 | 8.71 | 128.6 | 139.8 | 19.4 | 26.6 |
| Architectural, engineering and design services | 5413-5414 | 13.53 | 272.7 | 309.6 | 51.8 | 45.1 |
| Computer system design services | 5415 | 4.61 | 255.8 | 267.6 | 36.2 | 30.4 |
| Management, scientific and technical services | 5416-5417 | 11.49 | 168.0 | 187.3 | 25.3 | 24.4 |
| Advertising and related services | 5418 | -11.97 | 73.5 | 64.7 | 10.2 | 7.7 |
| Other professional services | 5419 | -0.28 | 70.8 | 70.6 | 6.2 | 9.2 |
| Business, building and other support services | 5511-5629 | 0.47 | 685.6 | 688.8 | 94.9 | 100.0 |
| Employment services | 5613 | 6.23 | 81.8 | 86.9 | 8.6 | 6.4 |
| Business services | 5614 | -22.21 | 145.4 | 113.1 | 10.7 | 12.6 |
| Travelling services | 5615 | -6.92 | 50.6 | 47.1 | 8.8 | 7.8 |
| Security services | 5616 | -7.32 | 86.1 | 79.8 | 9.5 | 13.0 |
| Building services | 5617 | 13.61 | 241.7 | 274.6 | 44.0 | 42.2 |
| Management of enterprises and other administrative services | 5511, 5611-5612, 5619 | 13.25 | 45.3 | 51.3 | 4.6 | 10.0 |
| Waste management and remediation services | 5621-5629 | 3.16 | 34.8 | 35.9 | 8.7 | 7.9 |
| Educational services | 6111-6117 | 1.13 | 1179.3 | 1192.6 | 155.9 | 155.4 |
| Primary and secondary education | 6111 | -0.43 | 744.8 | 741.6 | 87.5 | 86.7 |
| Post-secondary education | 6112 | -10.43 | 109.3 | 97.9 | 15.2 | 15.1 |
| University education | 6113 | 11.47 | 224.1 | 249.8 | 31.5 | 35.8 |
| Other schools and educational support | 6114-6117 | 2.27 | 101.1 | 103.4 | 21.7 | 17.8 |
| Health care and social assistance | 6211-6244 | 8.29 | 1780.3 | 1927.9 | 237.3 | 253.0 |
| Ambulatory health care services | 6211-6219 | 15.50 | 392.8 | 453.7 | 61.0 | 70.7 |
| Hospitals | 6220 | 5.43 | 640.6 | 675.4 | 91.3 | 88.1 |
| Nursing and residential care facilities | 6230 | 12.05 | 307.9 | 345.0 | 35.3 | 38.4 |
| Social assistance | 6241-6244 | 3.37 | 439.0 | 453.8 | 49.7 | 55.8 |
| Information, culture and recreation | 5111-5191, 7111-7139 | -0.95 | 760.5 | 753.3 | 113.8 | 124.0 |
| Publishing industries | 5111-5112, 5161 | -18.72 | 99.9 | 81.2 | 17.2 | 15.7 |
| Motion picture and sound recording industries | 5121-5122 | -2.88 | 62.5 | 60.7 | 11.3 | 12.6 |
| Broadcasting and telecommunications | 5151-5152, 5171-5179 | -6.64 | 201.7 | 188.3 | 22.9 | 29.4 |
| Information services and data processing services | 5181-5191 | 6.52 | 53.7 | 57.2 | 5.7 | 6.9 |
| Performing arts, spectator sports and related industries | 7111-7115 | 19.24 | 107.6 | 128.3 | 19.7 | 20.8 |
| Heritage institutions | 7121 | 12.71 | 29.9 | 33.7 | 2.3 | 1.6 |
| Amusement, gambling and recreation industries | 7131-7139 | -0.63 | 205.1 | 203.8 | 34.8 | 37.1 |
| Accommodation and food services | 7211-7224 | 7.96 | 1011.5 | 1092.0 | 168.4 | 174.3 |
| Accommodation services | 7211-7213 | 2.57 | 186.6 | 191.4 | 31.6 | 34.0 |
| Food services and drinking places | 7221-7224 | 9.19 | 824.9 | 900.7 | 136.9 | 140.3 |
| Other services | 8111-8141 | 6.18 | 703.9 | 747.4 | 93.3 | 104.2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Repair and maintenance | 8111-8114 | 6.07 | 248.9 | 264.0 | 34.4 | 36.6 |
| Personal and laundry services | 8121-8129 | 8.15 | 217.3 | **235.0** | **31.5** | **32.7** |
| Religious, grant-making, civic, and professional and similar organizations | 8131-8139 | -2.60 | 181.0 | 176.3 | 20.0 | 23.9 |
| Private households | 8141 | 26.94 | 56.8 | 72.1 | 7.5 | 11.0 |
| Public administration | 9110-9191 | 4.46 | 863.3 | 901.8 | 93.0 | 98.7 |
| Federal government public administration (including defence services) | 9110, 9111 | 10.27 | 321.4 | 354.4 | 34.2 | 39.3 |
| Provincial and territorial public administration | 9120 | 1.77 | 254.6 | 259.1 | 25.6 | 22.7 |
| Local, municipal and regional public administration and aboriginal, Inter and other extra-territorial public admin | 9130, 9141, 9191 | 0.35 | 287.3 | 288.3 | 33.2 | 36.7 |

**Table 3.1**

**The aggregate supply of literacy skill by jurisdiction, adults aged 16 and over, 2006**

| | Aggregate Literacy Supply for the Population | | |
|---|---|---|---|
| | Employed | Experienced[1] | Total |
| **Canada** | **4,589,092,800** | **5,248,521,600** | **6,984,745,950** |
| Newfoundland and Labrador | 56,804,150 | 75,921,350 | 110,171,000 |
| Prince Edward Island | 18,843,400 | 22,997,200 | 29,742,250 |
| Nova Scotia | 127,189,250 | 150,718,850 | 210,463,650 |
| New Brunswick | 95,354,000 | 114,377,750 | 157,135,050 |
| Quebec | 1,046,022,500 | 1,188,790,200 | 1,639,939,250 |
| Ontario | 1,740,891,600 | 1,983,987,600 | 2,639,763,000 |
| Manitoba | 165,828,200 | 188,193,200 | 249,150,000 |
| Saskatchewan | 146,392,500 | 166,546,200 | 217,953,750 |
| Alberta | 547,727,400 | 615,836,400 | 746,645,900 |
| British Columbia | 624,330,000 | 718,051,500 | 966,150,900 |
| Yukon | 5,383,600 | 6,376,900 | 7,341,600 |
| North West Territories | 6,577,650 | 7,905,150 | 9,225,000 |
| Nunavut | 3,080,600 | 4022450 | 5,226,400 |

1. Experienced population is the sum of the employed plus those who have worked in the past 5 years.

**Table 3.2**

**Estimates of the distribution of prose literacy skill by proficiency level, adults aged 16 and over, the provinces and territories, 2006**

| | Population by prose literacy skill level | | | | | |
|---|---|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Total |

| Jurisdiction | Number | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Employed** | | | | | | |
| Newfoundland and Labrador | 47,432 | 45,369 | 49,494 | 35,058 | 24,747 | 202,100 |
| Prince Edward Island | 15,048 | 15,048 | 16,416 | 11,628 | 8,208 | 66,350 |
| Nova Scotia | 84,452 | 93,342 | 106,676 | 84,452 | 62,228 | 431,150 |
| New Brunswick | 84,878 | 77,805 | 81,342 | 60,122 | 38,903 | 343,050 |
| Quebec | 882,655 | 844,278 | 921,031 | 652,397 | 422,139 | 3,722,500 |
| Ontario | 1,438,650 | 1,376,100 | 1,438,650 | 1,063,350 | 813,150 | 6,129,900 |
| Manitoba | 122,968 | 122,968 | 140,535 | 105,401 | 81,979 | 573,850 |
| Saskatchewan | 96,224 | 101,289 | 121,546 | 96,224 | 75,966 | 491,250 |
| Alberta | 372,566 | 391,194 | 447,079 | 353,937 | 279,424 | 1,844,200 |
| British Columbia | 386,184 | 429,093 | 514,911 | 407,638 | 343,274 | 2,081,100 |
| Yukon | 2,837 | 3,369 | 4,256 | 3,546 | 3,192 | 17,200 |
| Northwest Territories | 3,707 | 4,143 | 5,233 | 4,361 | 3,707 | 21,150 |
| Nunavut | 2,513 | 2,295 | 2,513 | 1,858 | 1,421 | 10,600 |
| **Total** | **3,577,099** | **3,414,504** | **3,902,290** | **2,926,717** | **2,113,740** | **15,934,350** |
| **Recently employed** | | | | | | |
| Newfoundland and Labrador | 22,144 | 16,977 | 16,239 | 10,334 | 5,905 | 71,600 |
| Prince Edward Island | 4,300 | 3,532 | 3,532 | 2,304 | 1,382 | 15,050 |
| Nova Scotia | 20,214 | 18,530 | 19,372 | 14,319 | 9,265 | 81,700 |
| New Brunswick | 22,036 | 16,894 | 16,160 | 10,284 | 5,876 | 71,250 |
| Quebec | 150,406 | 123,548 | 118,176 | 80,575 | 48,345 | 521,050 |
| Ontario | 239,198 | 194,902 | 203,761 | 141,747 | 88,592 | 868,200 |
| Manitoba | 20,906 | 17,690 | 18,494 | 12,865 | 8,845 | 78,800 |
| Saskatchewan | 16,254 | 15,547 | 16,254 | 12,014 | 8,480 | 68,550 |
| Alberta | 55,307 | 52,902 | 55,307 | 40,879 | 28,856 | 233,250 |
| British Columbia | 75,331 | 68,780 | 75,331 | 55,679 | 42,578 | 317,700 |
| Yukon | 744 | 744 | 812 | 609 | 440 | 3,350 |
| Northwest Territories | 1,055 | 1,009 | 1,055 | 780 | 551 | 4,450 |
| Nunavut | 1,091 | 845 | 774 | 458 | 282 | 3,450 |
| **Total** | **626,774** | **530,347** | **554,454** | **385,707** | **241,067** | **2,338,350** |
| **Not recently employed** | | | | | | |
| Newfoundland and Labrador | 63,541 | 34,796 | 27,232 | 15,129 | 6,052 | 146,750 |
| Prince Edward Island | 11,861 | 6,654 | 5,496 | 2,893 | 1,446 | 28,350 |
| Nova Scotia | 89,629 | 59,753 | 49,794 | 27,387 | 14,938 | 241,500 |
| New Brunswick | 83,229 | 44,518 | 34,840 | 17,420 | 7,742 | 187,750 |
| Quebec | 833,507 | 456,444 | 357,217 | 198,454 | 99,227 | 1,944,850 |
| Ontario | 1,174,544 | 658,891 | 515,654 | 286,474 | 143,237 | 2,778,800 |
| Manitoba | 100,843 | 59,471 | 49,129 | 28,443 | 15,514 | 253,400 |
| Saskatchewan | 76,064 | 48,596 | 42,258 | 25,355 | 12,677 | 204,950 |
| Alberta | 199,277 | 123,875 | 107,717 | 64,630 | 37,701 | 533,200 |
| British Columbia | 353,374 | 232,217 | 201,928 | 121,157 | 70,675 | 979,350 |
| Yukon | 1,192 | 894 | 782 | 484 | 298 | 3,650 |
| Northwest Territories | 1,717 | 1,197 | 1,093 | 677 | 416 | 5,100 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Nunavut | 1,714 | 1,176 | 1,029 | 588 | 294 | 4,800 |
| **Total** | **2,984,673** | **1,716,187** | **1,417,720** | **820,785** | **373,084** | **7,312,450** |
| **Total population** | | | | | | |
| Newfoundland and Labrador | 134,371 | 99,694 | 91,025 | 60,684 | 34,676 | 420,450 |
| Prince Edward Island | 31,357 | 25,758 | 24,638 | 16,798 | 11,199 | 109,750 |
| Nova Scotia | 194,420 | 171,090 | 178,866 | 124,429 | 85,545 | 754,350 |
| New Brunswick | 190,429 | 141,286 | 129,000 | 86,000 | 55,286 | 602,000 |
| Quebec | 1,894,423 | 1,452,391 | 1,389,244 | 884,064 | 568,327 | 6,188,450 |
| Ontario | 2,822,184 | 2,217,430 | 2,217,430 | 1,511,884 | 1,007,923 | 9,776,850 |
| Manitoba | 249,612 | 203,388 | 203,388 | 147,918 | 101,694 | 906,000 |
| Saskatchewan | 187,286 | 163,875 | 179,482 | 132,661 | 101,446 | 764,750 |
| Alberta | 619,020 | 565,192 | 619,020 | 457,537 | 349,881 | 2,610,650 |
| British Columbia | 827,302 | 723,889 | 792,831 | 586,006 | 448,122 | 3,378,150 |
| Yukon | 4,682 | 4,929 | 5,914 | 4,682 | 3,943 | 24,150 |
| Northwest Territories | 6,396 | 6,396 | 7,355 | 5,756 | 4,797 | 30,700 |
| Nunavut | 5,233 | 4,458 | 4,264 | 2,907 | 1,938 | 18,800 |
| **Total** | **7,121,640** | **5,802,818** | **5,802,818** | **3,956,466** | **2,901,409** | **25,585,150** |

**Proportion of the population by prose literacy level**

| Jurisdiction | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Levels 1 and 2 | Levels 4 and 5 | |
|---|---|---|---|---|---|---|---|---|
| | Percentage | | | | | | | |
| Newfoundland and Labrador | | 23 | 22 | 24 | 17 | 12 | 46 | 30 |
| Prince Edward Island | 23 | 23 | 25 | 18 | 12 | 45 | 30 | |
| Nova Scotia | 20 | 22 | 25 | 20 | 14 | 41 | 34 | |
| New Brunswick | 25 | 23 | 24 | 18 | 11 | 47 | 29 | |
| Quebec | 24 | 23 | 25 | 18 | 11 | 46 | 29 | |
| Ontario | 23 | 22 | 23 | 17 | 13 | 46 | 31 | |
| Manitoba | 21 | 21 | 24 | 18 | 14 | 43 | 33 | |
| Saskatchewan | 20 | 21 | 25 | 20 | 15 | 40 | 35 | |
| Alberta | 20 | 21 | 24 | 19 | 15 | 41 | 34 | |
| British Columbia | 19 | 21 | 25 | 20 | 16 | 39 | 36 | |
| Yukon | 16 | 20 | 25 | 21 | 19 | 36 | 39 | |
| Northwest Territories | 18 | 20 | 25 | 21 | 18 | 37 | 38 | |
| Nunavut | 24 | 22 | 24 | 18 | 13 | 45 | 31 | |
| **Total** | **22** | **21** | **24** | **18** | **13** | **44** | **32** | |
| Newfoundland and Labrador | | 31 | 24 | 23 | 14 | 8 | 55 | 23 |
| Prince Edward Island | 29 | 23 | 23 | 15 | 9 | 52 | 24 | |
| Nova Scotia | 25 | 23 | 24 | 18 | 11 | 47 | 29 | |
| New Brunswick | 31 | 24 | 23 | 14 | 8 | 55 | 23 | |
| Quebec | 29 | 24 | 23 | 15 | 9 | 53 | 25 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ontario | 28 | 22 | 23 | 16 | 10 | 50 | 27 |
| Manitoba | 27 | 22 | 23 | 16 | 11 | 49 | 28 |
| Saskatchewan | 24 | 23 | 24 | 18 | 12 | 46 | 30 |
| Alberta | 24 | 23 | 24 | 18 | 12 | 46 | 30 |
| British Columbia | 24 | 22 | 24 | 18 | 13 | 45 | 31 |
| Yukon | 22 | 22 | 24 | 18 | 13 | 44 | 31 |
| Northwest Territories | 24 | 23 | 24 | 18 | 12 | 46 | 30 |
| Nunavut | 32 | 24 | 22 | 13 | 8 | 56 | 21 |
| **Total** | **27** | **23** | **24** | **16** | **10** | **49** | **27** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Newfoundland and Labrador | 43 | 24 | 19 | 10 | 4 | 100 |
| Prince Edward Island | 42 | 23 | 19 | 10 | 5 | 100 |
| Nova Scotia | 37 | 25 | 21 | 11 | 6 | 100 |
| New Brunswick | 44 | 24 | 19 | 9 | 4 | 100 |
| Quebec | 43 | 23 | 18 | 10 | 5 | 100 |
| Ontario | 42 | 24 | 19 | 10 | 5 | 100 |
| Manitoba | 40 | 23 | 19 | 11 | 6 | 100 |
| Saskatchewan | 37 | 24 | 21 | 12 | 6 | 100 |
| Alberta | 37 | 23 | 20 | 12 | 7 | 100 |
| British Columbia | 36 | 24 | 21 | 12 | 7 | 100 |
| Yukon | 33 | 24 | 21 | 13 | 8 | 100 |
| Northwest Territories | 34 | 23 | 21 | 13 | 8 | 100 |
| Nunavut | 36 | 24 | 21 | 12 | 6 | 100 |
| **Total** | **41** | **23** | **19** | **11** | **5** | **100** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Newfoundland and Labrador | 32 | 24 | 22 | 14 | 8 | 100 |
| Prince Edward Island | 29 | 23 | 22 | 15 | 10 | 100 |
| Nova Scotia | 26 | 23 | 24 | 16 | 11 | 100 |
| New Brunswick | 32 | 23 | 21 | 14 | 9 | 100 |
| Quebec | 31 | 23 | 22 | 14 | 9 | 100 |
| Ontario | 29 | 23 | 23 | 15 | 10 | 100 |
| Manitoba | 28 | 22 | 22 | 16 | 11 | 100 |
| Saskatchewan | 24 | 21 | 23 | 17 | 13 | 100 |
| Alberta | 24 | 22 | 24 | 18 | 13 | 100 |
| British Columbia | 24 | 21 | 23 | 17 | 13 | 100 |
| Yukon | 19 | 20 | 24 | 19 | 16 | 100 |
| Northwest Territories | 21 | 21 | 24 | 19 | 16 | 100 |
| Nunavut | 28 | 24 | 23 | 15 | 10 | 100 |
| **Total** | **28** | **23** | **23** | **15** | **11** | **100** |

**Source:** IALSS, 2003 and 2006 Census of Population.

**Table 3.4**

**Proportion of experienced labour force that are employed by prose literacy proficiency level, adults aged 16 and over, Canada and the jurisdictions, 2006**

| Jurisdiction | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Total |
|---|---|---|---|---|---|---|
| | Percentage | | | | | |
| Newfoundland and Labrador | 68 | 73 | 75 | 77 | 81 | 74 |
| Prince Edward Island | 78 | 81 | 82 | 83 | 86 | 82 |
| Nova Scotia | 81 | 83 | 85 | 86 | 87 | 84 |
| New Brunswick | 79 | 82 | 83 | 85 | 87 | 83 |
| Quebec | 85 | 87 | 89 | 89 | 90 | 88 |
| Ontario | 86 | 88 | 88 | 88 | 90 | 88 |
| Manitoba | 85 | 87 | 88 | 89 | 90 | 88 |
| Saskatchewan | 86 | 87 | 88 | 89 | 90 | 88 |
| Alberta | 87 | 88 | 89 | 90 | 91 | 89 |
| British Columbia | 84 | 86 | 87 | 88 | 89 | 87 |
| Yukon | 79 | 82 | 84 | 85 | 88 | 84 |
| Northwest Territories | 78 | 80 | 83 | 85 | 87 | 83 |
| Nunavut | 70 | 73 | 76 | 80 | 83 | 75 |
| **Canada** | **85** | **87** | **88** | **88** | **90** | **87** |

**Table 3.5**

**Proportion of the population at prose literacy levels 1 and 2 by average prose literacy score, adults aged 16 and over, by jurisdiction, 2006**

| | **Proportion at levels 1 and 2** | |
|---|---|---|
| Jurisdiction | Percent | Average prose score |
| Newfoundland and Labrador | 56 | 264 |
| Prince Edward Island | 52 | 271 |
| Nova Scotia | 48 | 278 |
| New Brunswick | 55 | 265 |
| Quebec | 54 | 267 |
| Ontario | 52 | 271 |
| Manitoba | 50 | 275 |
| Saskatchewan | 46 | 282 |
| Alberta | 45 | 283 |
| British Columbia | 46 | 283 |
| Yukon | 40 | 294 |
| Northwest Territories | 42 | 291 |
| Nunavut | 52 | 273 |
| **Canada** | **51** | **273** |

**Source:** IALSS, 2003 and Census of Population, 2006

**Table 3.6**

**Aggregate literacy supply of current employment, selected industries, Alberta, 2006**

| Industry | Employed population | Aggregate score | Proportion of total supply | |
|---|---|---|---|---|
| Retail Trade | | | | 19 |
| Mining and Oil and Gas Extraction | | | | 12 |
| Transportation | | | | 91 |
| Food Services and Drinking Places | | | | 90 |
| Wholesale Trade | | | | 83 |
| Prime Contracting | | | | 80 |
| Trade Contracting | | | | 80 |
| Primary and Secondary Education | | | | 72 |
| Crop Production | | | | 68 |
| Hospitals | | | | 56 |
| Architectural, Engineering and Design Services | | | | 52 |
| Ambulatory Health Care Services | | | | 53 |
| Repair and Maintenance | | | | 39 |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | | | | 34 |
| Social Assistance | | | | 32 |
| Monetary Authorities - Central Bank & Credit Intermediation and Related Activities | | | | 28 |
| Federal Government Public Administration (including Defence Services) | | | | 27 |
| Nursing and Residential Care Facilities | | | | 27 |
| Provincial and Territorial Public Administration | | | | 25 |
| Building Services | | | | 28 |
| Real Estate | | | | 25 |
| Personal and Laundry Services | | | | 24 |
| Computer System Design Services | | | | 21 |
| Accommodation Services | | | | 23 |
| Management, Scientific and Technical Services | | | | 21 |
| Religious, Grant-Making, Civic, and Professional and Similar Organizations | | | | 22 |
| University Education | | | | 21 |
| Amusement, Gambling and Recreation Industries | | | | 20 |
| Insurance Carriers & Related Activities and Funds & Other Financial Vehicles | | | | 20 |
| Fabricated Metal Product Manufacturing | | | | 20 |
| Broadcasting and Telecommunications | | | | 17 |
| Utilities | | | | 17 |
| Accounting and Tax Preparation | | | | 16 |
| Food Manufacturing | | | | 19 |
| Legal Services | | | | 14 |
| Machinery Manufacturing | | | | 13 |
| Other Schools and Educational Support | | | | 12 |
| Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets | | | | 11 |
| Post-Secondary Education | | | | 10 |
| Wood Product Manufacturing | | | | 11 |
| Securities, Commodity Contracts, and Other Intermediation and Related Activities | | | | 9, |
| Performing Arts, Spectator Sports and Related Industries | | | | 9, |
| Management of Enterprises and Other Administrative Services | | | | 9, |
| Security Services | | | | 9, |
| Other Professional Services | | | | 8, |

| | |
|---|---|
| Chemical Manufacturing | 8, |
| Publishing Industries | 8, |
| Private Households | 7, |
| Business Services | 7, |
| Furniture and Related Product Manufacturing | 7, |
| Employment Services | 6, |
| Printing and Related Support Activities | 6, |
| Non-Metallic Mineral Product Manufacturing | 6, |
| Information Services and Data Processing Services | 5, |
| Plastics and Rubber Products Manufacturing | 6, |
| Advertising and Related Services | 5, |
| Miscellaneous Manufacturing | 5, |
| Transportation Equipment Manufacturing | 5, |
| Computer and Electronic Product Manufacturing | 4, |
| Waste Management and Remediation Services | 4, |
| Travelling Services | 4, |
| Warehousing and Storage | 4, |
| Forestry and Logging with support activities | 4, |
| Petroleum and Coal Products Manufacturing | 3, |
| Paper Manufacturing | 3, |
| Primary Metal Manufacturing | 3, |
| Motion Picture and Sound Recording Industries | 3, |
| Heritage Institutions | 2, |
| Electrical Equipment, Appliance and Component Manufacturing | 2, |
| Beverage and Tobacco Product Manufacturing | 2, |
| Clothing Manufacturing & Leather & Allied Product Manufacturing | 1, |
| Textile Mills & Textile Product Mills | 1, |
| Fishing, Hunting and Trapping | 20 |

**Table 3.7**

**The proportion of current employment with skills below prose literacy level 3, by industry, Alberta, 2006**

| Industry | Employed population | Percent at levels 1 and 2 | Average score | |
|---|---|---|---|---|
| Clothing Manufacturing & Leather & Allied Product Manufacturing | | | | 1, |
| Food Manufacturing | | | | 19 |
| Crop Production | | | | 68 |
| Furniture and Related Product Manufacturing | | | | 7, |
| Building Services | | | | 28 |
| Plastics and Rubber Products Manufacturing | | | | 6, |
| Private Households | | | | 7, |
| Textile Mills & Textile Product Mills | | | | 1, |
| Food Services and Drinking Places | | | | 90 |
| Wood Product Manufacturing | | | | 11 |
| Primary Metal Manufacturing | | | | 3, |
| Fishing, Hunting and Trapping | | | | 20 |
| Fabricated Metal Product Manufacturing | | | | 20 |

| | |
|---|---|
| Forestry and Logging with support activities | 4, |
| Non-Metallic Mineral Product Manufacturing | 6, |
| Transportation | 91 |
| Printing and Related Support Activities | 6, |
| Accommodation Services | 23 |
| Personal and Laundry Services | 24 |
| Security Services | 9, |
| Warehousing and Storage | 4, |
| Beverage and Tobacco Product Manufacturing | 2, |
| Retail Trade | 19 |
| Machinery Manufacturing | 13 |
| Trade Contracting | 80 |
| Waste Management and Remediation Services | 4, |
| Repair and Maintenance | 39 |
| Miscellaneous Manufacturing | 5, |
| Nursing and Residential Care Facilities | 27 |
| Electrical Equipment, Appliance and Component Manufacturing | 2, |
| Transportation Equipment Manufacturing | 5, |
| Paper Manufacturing | 3, |
| Real Estate | 25 |
| Prime Contracting | 80 |
| Wholesale Trade | 83 |
| Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets | 11 |
| Amusement, Gambling and Recreation Industries | 20 |
| Travelling Services | 4, |
| Management of Enterprises and Other Administrative Services | 9, |
| Employment Services | 6, |
| Computer and Electronic Product Manufacturing | 4, |
| Motion Picture and Sound Recording Industries | 3, |
| Business Services | 7, |
| Mining and Oil and Gas Extraction | 12 |
| Publishing Industries | 8, |
| Chemical Manufacturing | 8, |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | 34 |
| Advertising and Related Services | 5, |
| Insurance Carriers & Related Activities and Funds & Other Financial Vehicles | 20 |
| Social Assistance | 32 |
| Performing Arts, Spectator Sports and Related Industries | 9, |
| Monetary Authorities - Central Bank & Credit Intermediation and Related Activities | 28 |
| Utilities | 17 |
| Hospitals | 56 |
| Petroleum and Coal Products Manufacturing | 3, |
| Religious, Grant-Making, Civic, and Professional and Similar Organizations | 22 |
| Information Services and Data Processing Services | 5, |
| Other Schools and Educational Support | 12 |
| Ambulatory Health Care Services | 53 |
| Federal Government Public Administration (including Defence Services) | 27 |
| Broadcasting and Telecommunications | 17 |
| Accounting and Tax Preparation | 16 |
| Other Professional Services | 8, |

| | |
|---|---|
| Securities, Commodity Contracts, and Other Intermediation and Related Activities | 9, |
| Provincial and Territorial Public Administration | 25 |
| Heritage Institutions | 2, |
| Management, Scientific and Technical Services | 21 |
| Architectural, Engineering and Design Services | 52 |
| University Education | 21 |
| Post-Secondary Education | 10 |
| Primary and Secondary Education | 72 |
| Legal Services | 14 |
| Computer System Design Services | 21 |

**Table 3.8**

**The stock of literacy skill, selected occupations, Alberta, 2006**

| Occupation | Employment | Aggregate score | Percent of aggregate supply |
|---|---|---|---|
| Clerical Occupations | | | 174,950 |
| Sales & Service Occupations N.E.C. | | | 123,850 |
| Professional Occupations in Natural and Applied Sciences | | | 75,400 |
| Retail Salespersons and Sales Clerks | | | 75,250 |
| Technical Occupations Related to Natural and Applied Sciences | | | 65,200 |
| Teachers and Professors | | | 61,900 |
| Other Managers N.E.C. | | | 65,100 |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | | | 67,250 |
| Construction Trades | | | 61,400 |
| Occupations Unique to Agriculture Excluding Labourers | | | 62,900 |
| Managers in Retail Trade, Food and Accommodation Services | | | 53,000 |
| Specialist Managers | | | 46,750 |
| Professional Occupations in Business and Finance | | | 46,400 |
| Administrative and Regulatory Occupations | | | 43,100 |
| Mechanics | | | 44,900 |
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | | | 44,300 |
| Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers | | | 36,500 |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | | | 36,150 |
| Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C. | | | 34,000 |
| Machinists, Metal Forming, Shaping and Erecting Occupations | | | 35,250 |
| Nurse Supervisors and Registered Nurses | | | 31,250 |
| Finance and Insurance Administrative Occupations | | | 28,400 |
| Childcare and Home Support Workers | | | 29,800 |
| Occupations in Food and Beverage Service | | | 28,800 |
| Machine Operators in Manufacturing | | | 30,250 |
| Secretaries | | | 27,300 |
| Cashiers | | | 28,100 |
| Technical Occupations in Art, Culture, Recreation and Sport | | | 25,500 |

| | |
|---|---|
| Technical and Related Occupations in Health | 25,750 |
| Occupations in Protective Services | 25,750 |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | 24,550 |
| Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers | 24,950 |
| Chefs and Cooks | 25,350 |
| Assisting Occupations in Support of Health Services | 23,550 |
| Professional Occupations in Health | 20,750 |
| Primary Production Labourers | 21,850 |
| Heavy Equipment and Crane Operators Including Drillers | 21,350 |
| Senior Management Occupations | 19,150 |
| Contractors and Supervisors in Trades and Transportation | 20,450 |
| Professional Occupations in Art and Culture | 17,400 |
| Sales and Service Supervisors | 17,000 |
| Occupations in Travel and Accommodation Including Attendants in Recreation and Sport | 15,650 |
| Other Trades N.E.C. | 15,350 |
| Labourers in Processing, Manufacturing and Utilities | 15,300 |
| Assemblers in Manufacturing | 11,450 |
| Clerical Supervisors | 9,650 |
| Supervisors in Manufacturing | 5,750 |
| Total all occupations | 1,843,95 |

**Table 3.9**

**The proportion of current employment with skills below level 3 by occupation, Alberta, 2006**

| | Employed population | Percent age Levels 1 and 2 | Average score | Aggregate score |
|---|---|---|---|---|
| Occupation | Number | Percentage | | |
| Labourers in Processing, Manufacturing and Utilities | 15,300 | | | |
| Assemblers in Manufacturing | 11,450 | | | |
| Machine Operators in Manufacturing | 30,250 | | | |
| Occupations Unique to Agriculture Excluding Labourers | 62,900 | | | |
| Chefs and Cooks | 25,350 | | | |
| Supervisors in Manufacturing | 5,750 | | | |
| Sales & Service Occupations N.E.C. | 123,850 | | | |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | 67,250 | | | |
| Heavy Equipment and Crane Operators Including Drillers | 21,350 | | | |
| Cashiers | 28,100 | | | |
| Other Trades N.E.C. | 15,350 | | | |
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | 44,300 | | | |
| Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers | 24,950 | | | |
| Contractors and Supervisors in Trades and Transportation | 20,450 | | | |

| | |
|---|---|
| Construction Trades | 61,400 |
| Childcare and Home Support Workers | 29,800 |
| Sales and Service Supervisors | 17,000 |
| Retail Salespersons and Sales Clerks | 75,250 |
| Primary Production Labourers | 21,850 |
| Machinists, Metal Forming, Shaping and Erecting Occupations | 35,250 |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | 36,150 |
| Occupations in Food and Beverage Service | 28,800 |
| Occupations in Travel and Accommodation Including Attendants in Recreation and Sport | 15,650 |
| Mechanics | 44,900 |
| Assisting Occupations in Support of Health Services | 23,550 |
| Managers in Retail Trade, Food and Accommodation Services | 53,000 |
| Occupations in Protective Services | 25,750 |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | 24,550 |
| Secretaries | 27,300 |
| Finance and Insurance Administrative Occupations | 28,400 |
| Clerical Supervisors | 9,650 |
| Clerical Occupations | 174,950 |
| Technical and Related Occupations in Health | 25,750 |
| Other Managers N.E.C. | 65,100 |
| Administrative and Regulatory Occupations | 43,100 |
| Technical Occupations in Art, Culture, Recreation and Sport | 25,500 |
| Nurse Supervisors and Registered Nurses | 31,250 |
| Senior Management Occupations | 19,150 |
| Specialist Managers | 46,750 |
| Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C. | 34,000 |
| Professional Occupations in Art and Culture | 17,400 |
| Professional Occupations in Business and Finance | 46,400 |
| Professional Occupations in Health | 20,750 |
| Technical Occupations Related to Natural and Applied Sciences | 65,200 |
| Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers | 36,500 |
| Professional Occupations in Natural and Applied Sciences | 75,400 |
| Teachers and Professors | 61,900 |
| Total all occupations | 1,843,95 |

**Employment by proficiency level**

| Occupation | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|---|---|---|---|
| | Percentage | | | | |
| Labourers in Processing, Manufacturing and Utilities | 3 | | | | |
| Assemblers in Manufacturing | 3 | | | | |
| Machine Operators in Manufacturing | 2 | | | | |
| Occupations Unique to Agriculture Excluding Labourers | 2 | | | | |
| Chefs and Cooks | 2 | | | | |
| Supervisors in Manufacturing | 2 | | | | |

| | |
|---|---|
| Sales & Service Occupations N.E.C. | 2 |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | 2 |
| Heavy Equipment and Crane Operators Including Drillers | 2 |
| Cashiers | 2 |
| Other Trades N.E.C. | 2 |
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | 2 |
| Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers | 2 |
| Contractors and Supervisors in Trades and Transportation | 2 |
| Construction Trades | 2 |
| Childcare and Home Support Workers | 2 |
| Sales and Service Supervisors | 2 |
| Retail Salespersons and Sales Clerks | 2 |
| Primary Production Labourers | 2 |
| Machinists, Metal Forming, Shaping and Erecting Occupations | 2 |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | 1 |
| Occupations in Food and Beverage Service | 2 |
| Occupations in Travel and Accommodation Including Attendants in Recreation and Sport | 2 |
| Mechanics | 1 |
| Assisting Occupations in Support of Health Services | 1 |
| Managers in Retail Trade, Food and Accommodation Services | 1 |
| Occupations in Protective Services | 1 |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | 1 |
| Secretaries | 1 |
| Finance and Insurance Administrative Occupations | 1 |
| Clerical Supervisors | 1 |
| Clerical Occupations | 1 |
| Technical and Related Occupations in Health | 1 |
| Other Managers N.E.C. | 1 |
| Administrative and Regulatory Occupations | 1 |
| Technical Occupations in Art, Culture, Recreation and Sport | 1 |
| Nurse Supervisors and Registered Nurses | 1 |
| Senior Management Occupations | 1 |
| Specialist Managers | 1 |
| Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C. | 1 |
| Professional Occupations in Art and Culture | 1 |
| Professional Occupations in Business and Finance | 1 |
| Professional Occupations in Health | 1 |
| Technical Occupations Related to Natural and Applied Sciences | 1 |
| Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers | 1 |
| Professional Occupations in Natural and Applied Sciences | 9 |
| Teachers and Professors | 9 |

**Table 3.10**

**The proportion of employment with skills above prose literacy level 3, by industry, Alberta, 2006**

**Proportion of employment by proficiency level**

| Industry | Employed population | Percent at levels 4 and 5 | Average score | Aggregate score | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|---|---|---|---|---|---|---|---|
| Primary and Secondary Education | 704,650 | 40% | 306 | 215,622,900 | 14% | | | | |
| Post-Secondary Education | 86,900 | 39% | 306 | 26,591,400 | 14% | | | | |
| Legal Services | 134,050 | 39% | 305 | 40,885,250 | 14% | | | | |
| University Education | 201,850 | 39% | 306 | 61,766,100 | 14% | | | | |
| Architectural, Engineering and Design Services | 250,900 | 39% | 304 | 76,273,600 | 15% | | | | |
| Computer System Design Services | 225,650 | 39% | 306 | 69,048,900 | 14% | | | | |
| Management, Scientific and Technical Services | 184,250 | 38% | 303 | 55,827,750 | 15% | | | | |
| Provincial and Territorial Public Administration | 255,400 | 38% | 301 | 76,875,400 | 16% | | | | |
| Heritage Institutions | 25,400 | 36% | 300 | 7,620,000 | 16% | | | | |
| Federal Government Public Administration (including Defence Services) | 383,850 | 36% | 300 | 115,155,000 | 16% | | | | |
| Accounting and Tax Preparation | 134,300 | 36% | 297 | 39,887,100 | 17% | | | | |
| Information Services and Data Processing Services | 55,950 | 36% | 298 | 16,673,100 | 17% | | | | |
| Securities, Commodity Contracts, and Other Intermediation and Related Activities | 120,200 | 36% | 298 | 35,819,600 | 17% | | | | |
| Other Schools and Educational Support | 114,550 | 36% | 299 | 34,250,450 | 17% | | | | |
| Broadcasting and Telecommunications | 176,450 | 35% | 296 | 52,229,200 | 17% | | | | |
| Other Professional Services | 81,800 | 35% | 297 | 24,294,600 | 17% | | | | |
| Publishing Industries | 101,150 | 34% | 295 | 29,839,250 | 18% | | | | |
| Motion Picture and Sound Recording Industries | 60,200 | 34% | 295 | 17,759,000 | 18% | | | | |
| Social Assistance | 339,950 | 34% | 294 | 99,945,300 | 19% | | | | |
| Religious, Grant-Making, Civic, and Professional and Similar Organizations | 217,000 | 34% | 295 | 64,015,000 | 18% | | | | |
| Utilities | 129,000 | 34% | 294 | 37,926,000 | 18% | | | | |
| Mining and Oil and Gas Extraction | 222,550 | 34% | 294 | 65,429,700 | 19% | | | | |
| Hospitals | 553,250 | 33% | 292 | 161,549,000 | 19% | | | | |
| Ambulatory Health Care Services | 467,000 | 33% | 293 | 136,831,000 | 18% | | | | |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | 303,650 | 33% | 292 | 88,665,800 | 19% | | | | |
| Insurance Carriers & Related Activities and Funds & Other Financial Vehicles | 222,550 | 33% | 293 | 65,207,150 | 18% | | | | |
| Business Services | 111,350 | 33% | 293 | 32,625,550 | 18% | | | | |
| Performing Arts, Spectator Sports and Related Industries | 99,300 | 33% | 293 | 29,094,900 | 19% | | | | |
| Monetary Authorities - Central Bank & Credit Intermediation and Related Activities | 328,600 | 33% | 293 | 96,279,800 | 18% | | | | |
| Advertising and Related Services | 67,600 | 33% | 291 | 19,671,600 | 19% | | | | |
| Petroleum and Coal Products Manufacturing | 14,250 | 32% | 289 | 4,118,250 | 20% | | | | |
| Management of Enterprises and Other Administrative Services | 80,900 | 31% | 286 | 23,137,400 | 21% | | | | |
| Amusement, Gambling and Recreation Industries | 188,700 | 31% | 288 | 54,345,600 | 21% | | | | |
| Computer and Electronic Product Manufacturing | 85,400 | 30% | 285 | 24,339,000 | 22% | | | | |
| Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets | 74,100 | 30% | 285 | 21,118,500 | 21% | | | | |
| Real Estate | 218,450 | 29% | 283 | 61,821,350 | 23% | | | | |
| Forestry and Logging with support activities | 64,450 | 29% | 280 | 18,046,000 | 24% | | | | |
| Chemical Manufacturing | 88,700 | 29% | 282 | 25,013,400 | 23% | | | | |
| Travelling Services | 48,200 | 29% | 285 | 13,737,000 | 22% | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Employment Services | 73,000 | 29% | 281 | 20,513,000 | 24% |
| Wholesale Trade | 709,550 | 29% | 282 | 200,093,100 | 23% |
| Nursing and Residential Care Facilities | 304,600 | 29% | 282 | 85,897,200 | 23% |
| Prime Contracting | 450,950 | 28% | 279 | 125,815,050 | 24% |
| Retail Trade | 1,795,850 | 28% | 279 | 501,042,150 | 24% |
| Beverage and Tobacco Product Manufacturing | 29,700 | 28% | 281 | 8,345,700 | 23% |
| Machinery Manufacturing | 125,650 | 27% | 278 | 34,930,700 | 25% |
| Warehousing and Storage | 32,200 | 27% | 277 | 8,919,400 | 25% |
| Accommodation Services | 186,700 | 27% | 278 | 51,902,600 | 25% |
| Personal and Laundry Services | 225,300 | 26% | 275 | 61,957,500 | 25% |
| Transportation | 753,750 | 26% | 275 | 207,281,250 | 26% |
| Trade Contracting | 538,250 | 26% | 278 | 149,633,500 | 24% |
| Paper Manufacturing | 85,600 | 26% | 276 | 23,625,600 | 25% |
| Repair and Maintenance | 265,950 | 26% | 277 | 73,668,150 | 25% |
| Security Services | 90,600 | 26% | 278 | 25,186,800 | 24% |
| Primary Metal Manufacturing | 81,800 | 26% | 274 | 22,413,200 | 26% |
| Waste Management and Remediation Services | 34,800 | 26% | 277 | 9,639,600 | 25% |
| Miscellaneous Manufacturing | 71,850 | 25% | 272 | 19,543,200 | 27% |
| Food Services and Drinking Places | 824,650 | 25% | 273 | 225,129,450 | 26% |
| Electrical Equipment, Appliance and Component Manufacturing | 46,250 | 25% | 272 | 12,580,000 | 27% |
| Printing and Related Support Activities | 87,000 | 25% | 273 | 23,751,000 | 27% |
| Non-Metallic Mineral Product Manufacturing | 58,600 | 24% | 271 | 15,880,600 | 27% |
| Wood Product Manufacturing | 137,150 | 24% | 268 | 36,756,200 | 29% |
| Fabricated Metal Product Manufacturing | 177,450 | 24% | 271 | 48,088,950 | 28% |
| Transportation Equipment Manufacturing | 250,750 | 24% | 271 | 67,953,250 | 28% |
| Building Services | 242,250 | 22% | 267 | 64,680,750 | 30% |
| Crop Production | 376,250 | 22% | 263 | 98,953,750 | 31% |
| Food Manufacturing | 229,400 | 21% | 261 | 59,873,400 | 32% |
| Plastics and Rubber Products Manufacturing | 118,650 | 21% | 262 | 31,086,300 | 32% |
| Private Households | 68,100 | 20% | 262 | 17,842,200 | 32% |
| Furniture and Related Product Manufacturing | 104,600 | 20% | 259 | 27,091,400 | 33% |
| Textile Mills & Textile Product Mills | 33,000 | 19% | 256 | 8,448,000 | 34% |
| Fishing, Hunting and Trapping | 33,200 | 18% | 254 | 8,432,800 | 35% |
| Clothing Manufacturing & Leather & Allied Product Manufacturing | 68,350 | 15% | 239 | 16,335,650 | 43% |

**Table 3.15**

**Projected number and proportion of adults aged 16 and over by prose literacy proficiency level, Canada, 2001-2016**

| | Canada | | | | |
|---|---|---|---|---|---|
| | Total | Level 1 | Level 2 | Level 3 | Level 4/5 |
| | Number (000) | | | | |
| 2001 | 17,000 | 3,000 | 5,000 | 6,000 | 3,000 |
| 2006 | 20,000 | 3,000 | 6,000 | 7,000 | 3,000 |

| | | | | | |
|---|---|---|---|---|---|
| 2011 | 22,000 | 4,000 | 6,000 | 8,000 | 4,000 |
| 2016 | 24,000 | 4,000 | 7,000 | 9,000 | 4,000 |
| 2021 | 26,000 | 4,000 | 7,000 | 10,000 | 5,000 |
| 2026 | 27,000 | 4,000 | 8,000 | 10,000 | 5,000 |
| 2031 | 29,000 | 4,000 | 8,000 | 11,000 | 6,000 |
| | | | Percent | | |
| 2001 | 100 | 18 | 29 | 35 | 18 |
| 2006 | 100 | 15 | 30 | 35 | 15 |
| 2011 | 100 | 18 | 27 | 36 | 18 |
| 2016 | 100 | 17 | 29 | 38 | 17 |
| 2021 | 100 | 15 | 27 | 38 | 19 |
| 2026 | 100 | 15 | 30 | 37 | 19 |
| 2031 | 100 | 14 | 28 | 38 | 21 |

**Tables 3.16 A to C** continued

**Projected numbers and proportions of adults aged 16 and over by prose literacy proficiency level, 5 year intervals 2001-2016, for Alberta, Calgary and Edmonton**

| | | | **Alberta** | | |
|---|---|---|---|---|---|
| | Total | Level 1 | Level 2 | Level 3 | Level 4/5 |
| | | | Number | | |
| | **Total** | **Level 1** | **Level 2** | **Level 3** | **Level 4/5** |
| 2001 | 2,357,000 | 396,000 | 629,000 | 888,000 | 444,000 |
| 2006 | 2,602,000 | 413,000 | 681,000 | 993,000 | 514,000 |
| 2011 | 2,828,000 | 430,000 | 733,000 | 1,091,000 | 575,000 |
| 2016 | 3,025,000 | 449,000 | 784,000 | 1,169,000 | 623,000 |
| 2021 | 3,190,000 | 470,000 | 833,000 | 1,230,000 | 657,000 |
| 2026 | 3,347,000 | 494,000 | 884,000 | 1,284,000 | 686,000 |
| 2031 | 3,499,000 | 516,000 | 932,000 | 1,337,000 | 715,000 |
| | | | Percent | | |
| 2001 | 100% | 17% | 27% | 38% | 19% |
| 2006 | 100% | 16% | 26% | 38% | 20% |
| 2011 | 100% | 15% | 26% | 39% | 20% |
| 2016 | 100% | 15% | 26% | 39% | 21% |
| 2021 | 100% | 15% | 26% | 39% | 21% |
| 2026 | 100% | 15% | 26% | 38% | 20% |
| 2031 | 100% | 15% | 27% | 38% | 20% |

**Tables 3.16 A to C** continued

**Projected numbers and proportions of adults aged 16 and over by prose literacy proficiency level, 5 year intervals 2001-2016, for Alberta, Calgary and Edmonton**

| | Calgary | | | | |
|---|---|---|---|---|---|
| | Total | Level 1 | Level 2 | Level 3 | Level 4/5 |
| | Number | | | | |
| | **Total** | **Level 1** | **Level 2** | **Level 3** | **Level 4/5** |
| 2001 | 769,000 | 120,000 | 197,000 | 294,000 | 159,000 |
| 2006 | 857,000 | 129,000 | 218,000 | 330,000 | 181,000 |
| 2011 | 941,000 | 138,000 | 239,000 | 363,000 | 202,000 |
| 2016 | 1,021,000 | 148,000 | 260,000 | 394,000 | 219,000 |
| 2021 | 1,091,000 | 158,000 | 280,000 | 419,000 | 233,000 |
| 2026 | 1,158,000 | 170,000 | 301,000 | 442,000 | 246,000 |
| 2031 | 1,221,000 | 180,000 | 321,000 | 463,000 | 257,000 |
| | Percent | | | | |
| 2001 | 100% | 16% | 26% | 38% | 21% |
| 2006 | 100% | 15% | 25% | 39% | 21% |
| 2011 | 100% | 15% | 25% | 39% | 21% |
| 2016 | 100% | 14% | 25% | 39% | 21% |
| 2021 | 100% | 14% | 26% | 38% | 21% |
| 2026 | 100% | 15% | 26% | 38% | 21% |
| 2031 | 100% | 15% | 26% | 38% | 21% |

**Tables 3.16 A to C** concluded

**Projected numbers and proportions of adults aged 16 and over by prose literacy proficiency level, 5 year intervals 2001-2016, for Alberta, Calgary and Edmonton**

| | Edmonton | | | | |
|---|---|---|---|---|---|
| | Total | Level 1 | Level 2 | Level 3 | Level 4/5 |
| | Number | | | | |
| | **Total** | **Level 1** | **Level 2** | **Level 3** | **Level 4/5** |
| 2001 | 752,000 | 130,000 | 199,000 | 281,000 | 143,000 |
| 2006 | 830,000 | 135,000 | 215,000 | 314,000 | 165,000 |
| 2011 | 905,000 | 141,000 | 233,000 | 346,000 | 185,000 |
| 2016 | 969,000 | 147,000 | 249,000 | 372,000 | 202,000 |
| 2021 | 1,029,000 | 154,000 | 267,000 | 394,000 | 214,000 |
| 2026 | 1,083,000 | 162,000 | 284,000 | 413,000 | 225,000 |
| 2031 | 1,133,000 | 169,000 | 299,000 | 431,000 | 234,000 |

| | | | | | Percent |
|---|---|---|---|---|---|
| 2001 | 100% | 17% | 26% | 37% | 19% |
| 2006 | 100% | 16% | 26% | 38% | 20% |
| 2011 | 100% | 16% | 26% | 38% | 20% |
| 2016 | 100% | 15% | 26% | 38% | 21% |
| 2021 | 100% | 15% | 26% | 38% | 21% |
| 2026 | 100% | 15% | 26% | 38% | 21% |
| 2031 | 100% | 15% | 26% | 38% | 21% |

**Table 4.1**

**Aggregate prose literacy supply and demand at peak level and net surplus, Canada and the jurisdictions, 2006**

| | Aggregate prose literacy supply total population | Aggregate prose literacy demand (employed) | Net supply (population) | Literacy utilization rate |
|---|---|---|---|---|
| Jurisdiction | (in points) | (in points) | (in points) | Percent |
| Newfoundland and Labrador | 108,534,146 | 58,005,000 | 50,529,146 | 53 |
| Prince Edward Island | 29,374,847 | 18,833,750 | 10,541,097 | 64 |
| Nova Scotia | 208,979,697 | 123,566,250 | 85,413,447 | 59 |
| New Brunswick | 155,357,210 | 97,943,750 | 57,413,460 | 63 |
| Quebec | 1,618,181,133 | 1,070,962,500 | 547,218,633 | 66 |
| Ontario | 2,610,526,015 | 1,767,867,500 | 842,658,515 | 68 |
| Manitoba | 246,789,566 | 164,300,000 | 82,489,566 | 67 |
| Saskatchewan | 216,214,079 | 138,575,000 | 77,639,079 | 64 |
| Alberta | 742,658,609 | 529,208,750 | 213,449,859 | 71 |
| British Columbia | 959,331,283 | 597,748,750 | 361,582,533 | 62 |
| Yukon | 7,321,867 | 4,981,250 | 2,340,617 | 68 |
| Northwest Territories | 9,188,466 | 6,125,000 | 3,063,466 | 67 |
| Nunavut | 5,175,472 | 3,047,500 | 2,127,972 | 59 |
| **Total** | **6,917,632,390** | **4,581,093,750** | **2,336,538,640** | **66** |

**Table 4.2**

**Aggregate prose literacy supply and demand at peak level and net literacy (surplus) deficit, Canada and the jurisdictions, 2006**

| | Aggregate prose literacy supply employed population | Aggregate prose literacy demand employed population | Net literacy surplus (deficit) | Literacy utilization rate |
|---|---|---|---|---|

| Jurisdiction | (in points) | (in points) | (in points) | Percent |
|---|---|---|---|---|
| Newfoundland and Labrador | 56,231,358 | 58,005,000 | (1,773,642) | 103 |
| Prince Edward Island | 18,653,454 | 18,833,750 | (180,296) | 101 |
| Nova Scotia | 126,350,752 | 123,566,250 | 2,784,502 | 98 |
| New Brunswick | 94,280,462 | 97,943,750 | (3,663,288) | 104 |
| Quebec | 1,032,738,439 | 1,070,962,500 | (38,224,061) | 104 |
| Ontario | 1,724,328,306 | 1,767,867,500 | (43,539,194) | 103 |
| Manitoba | 164,380,057 | 164,300,000 | 80,057 | 100 |
| Saskatchewan | 145,507,210 | 138,575,000 | 6,932,210 | 95 |
| Alberta | 543,359,100 | 529,208,750 | 14,150,350 | 97 |
| British Columbia | 620,519,221 | 597,748,750 | 22,770,471 | 96 |
| Yukon | 5,368,232 | 4,981,250 | 386,982 | 93 |
| Northwest Territories | 6,560,444 | 6,125,000 | 435,444 | 93 |
| Nunavut | 3,070,210 | 3,047,500 | 22,710 | 99 |
| **Total** | **4,541,347,244** | **4,581,093,750** | **(39,746,506)** | **101** |

**Table 4.3**

**Aggregate literacy skill surplus and literacy skill shortage, peak demand, all occupations, 2006, Ontario**

| | Employment | Demand complex | Available supply | Net supply Difference | Spread aggregate point | Average point spread per worker |
|---|---|---|---|---|---|---|
| Level 1 | - | - | - | - | 0 | |
| Level 2 | 281,550 | 63,348,750 | 77,707,800 | 14,359,050 | 3378600 | 12 |
| Level 3 | 997,150 | 274,216,250 | 293,162,100 | 18,945,850 | 21937300 | 22 |
| Level 4 | 408,150 | 132,648,750 | 122,036,850 | -10,611,900 | 18366750 | 45 |
| Level 5 | 157,350 | 59,006,250 | 49,722,600 | -9,283,650 | 10699800 | 68 |
| Total | **1,844,150** | **529,220,000** | **542,629,350** | 13,409,350 | **54,382,450** | 29 |

**Note:** Positive Number's are over-qualified.

**Table 4.4**

**Proportion of workers below the required literacy skill level, by industry, Alberta, 2006**

| Industry | Percentage with shortage |
|---|---|
| Primary and Secondary Education | 62% |
| Private Households | 62% |
| Legal Services | 61% |
| Hospitals | 56% |

| | |
|---|---|
| Accounting and Tax Preparation | 56% |
| Travelling Services | 56% |
| Clothing Manufacturing & Leather & Allied Product Manufacturing | 55% |
| Personal and Laundry Services | 53% |
| Furniture and Related Product Manufacturing | 53% |
| Publishing Industries | 52% |
| Printing and Related Support Activities | 52% |
| Nursing and Residential Care Facilities | 51% |
| Trade Contracting | 51% |
| Electrical Equipment, Appliance and Component Manufacturing | 51% |
| Textile Mills & Textile Product Mills | 51% |
| Machinery Manufacturing | 51% |
| Fabricated Metal Product Manufacturing | 50% |
| Food Manufacturing | 50% |
| Plastics and Rubber Products Manufacturing | 49% |
| Computer and Electronic Product Manufacturing | 49% |
| Primary Metal Manufacturing | 49% |
| Architectural, Engineering and Design Services | 49% |
| Security Services | 48% |
| Fishing, Hunting and Trapping | 48% |
| Transportation | 48% |
| Ambulatory Health Care Services | 48% |
| Beverage and Tobacco Product Manufacturing | 48% |
| Federal Government Public Administration (including Defence Services) | 48% |
| Transportation Equipment Manufacturing | 48% |
| Utilities | 47% |
| Retail Trade | 47% |
| Provincial and Territorial Public Administration | 47% |
| Miscellaneous Manufacturing | 47% |
| Wood Product Manufacturing | 46% |
| Wholesale Trade | 46% |
| Other Professional Services | 46% |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | 46% |
| Chemical Manufacturing | 46% |
| Advertising and Related Services | 46% |
| Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets | 46% |
| Information Services and Data Processing Services | 46% |
| Non-Metallic Mineral Product Manufacturing | 46% |
| Social Assistance | 45% |
| Repair and Maintenance | 45% |
| Real Estate | 45% |
| Management of Enterprises and Other Administrative Services | 44% |
| Paper Manufacturing | 44% |
| Management, Scientific and Technical Services | 44% |
| Prime Contracting | 44% |
| Warehousing and Storage | 44% |
| Food Services and Drinking Places | 43% |
| Computer System Design Services | 43% |
| Employment Services | 42% |
| Waste Management and Remediation Services | 42% |

| | |
|---|---|
| Petroleum and Coal Products Manufacturing | 42% |
| Insurance Carriers & Related Activities and Funds & Other Financial Vehicles | 42% |
| Religious, Grant-Making, Civic, and Professional and Similar Organizations | 41% |
| Other Schools and Educational Support | 41% |
| Broadcasting and Telecommunications | 41% |
| Performing Arts, Spectator Sports and Related Industries | 40% |
| Forestry and Logging with support activities | 40% |
| Business Services | 40% |
| Mining and Oil and Gas Extraction | 40% |
| Crop Production | 39% |
| Heritage Institutions | 39% |
| Monetary Authorities - Central Bank & Credit Intermediation and Related Activities | 39% |
| Securities, Commodity Contracts, and Other Intermediation and Related Activities | 37% |
| Motion Picture and Sound Recording Industries | 37% |
| Amusement, Gambling and Recreation Industries | 36% |
| University Education | 35% |
| Accommodation Services | 35% |
| Post-Secondary Education | 35% |
| Building Services | 34% |

**Table 4.5**

**Number of workers below the required literacy skill level, by industry, Alberta, 2006**

| Industry | Number of workers with shortage |
|---|---|
| Retail Trade | 91,941 |
| Mining and Oil and Gas Extraction | 50,483 |
| Primary and Secondary Education | 44,833 |
| Transportation | 43,829 |
| Trade Contracting | 41,415 |
| Wholesale Trade | 38,432 |
| Food Services and Drinking Places | 38,352 |
| Prime Contracting | 35,294 |
| Hospitals | 31,898 |
| Crop Production | 27,036 |
| Architectural, Engineering and Design Services | 25,824 |
| Ambulatory Health Care Services | 25,790 |
| Repair and Maintenance | 17,901 |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | 15,656 |
| Social Assistance | 14,716 |
| Nursing and Residential Care Facilities | 14,252 |
| Federal Government Public Administration (including Defence Services) | 13,290 |
| Personal and Laundry Services | 13,081 |
| Provincial and Territorial Public Administration | 11,989 |
| Real Estate | 11,373 |
| Monetary Authorities - Central Bank & Credit Intermediation and Related Activities | 10,982 |

| | |
|---|---|
| Fabricated Metal Product Manufacturing | 10,045 |
| Management, Scientific and Technical Services | 9,602 |
| Accounting and Tax Preparation | 9,524 |
| Food Manufacturing | 9,515 |
| Building Services | 9,489 |
| Religious, Grant-Making, Civic, and Professional and Similar Organizations | 9,208 |
| Computer System Design Services | 9,147 |
| Legal Services | 8,732 |
| Insurance Carriers & Related Activities and Funds & Other Financial Vehicles | 8,358 |
| Utilities | 8,327 |
| Accommodation Services | 8,326 |
| University Education | 7,562 |
| Amusement, Gambling and Recreation Industries | 7,466 |
| Broadcasting and Telecommunications | 7,014 |
| Machinery Manufacturing | 6,994 |
| Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets | 5,220 |
| Wood Product Manufacturing | 5,109 |
| Other Schools and Educational Support | 4,958 |
| Private Households | 4,837 |
| Security Services | 4,411 |
| Publishing Industries | 4,200 |
| Management of Enterprises and Other Administrative Services | 4,182 |
| Furniture and Related Product Manufacturing | 4,036 |
| Performing Arts, Spectator Sports and Related Industries | 3,984 |
| Chemical Manufacturing | 3,891 |
| Other Professional Services | 3,849 |
| Post-Secondary Education | 3,706 |
| Securities, Commodity Contracts, and Other Intermediation and Related Activities | 3,660 |
| Printing and Related Support Activities | 3,545 |
| Plastics and Rubber Products Manufacturing | 3,106 |
| Non-Metallic Mineral Product Manufacturing | 3,052 |
| Employment Services | 2,799 |
| Business Services | 2,778 |
| Advertising and Related Services | 2,593 |
| Information Services and Data Processing Services | 2,576 |
| Miscellaneous Manufacturing | 2,561 |
| Travelling Services | 2,521 |
| Transportation Equipment Manufacturing | 2,472 |
| Computer and Electronic Product Manufacturing | 2,391 |
| Waste Management and Remediation Services | 2,010 |
| Warehousing and Storage | 1,940 |
| Primary Metal Manufacturing | 1,847 |
| Forestry and Logging with support activities | 1,746 |
| Paper Manufacturing | 1,593 |
| Petroleum and Coal Products Manufacturing | 1,542 |
| Electrical Equipment, Appliance and Component Manufacturing | 1,257 |
| Motion Picture and Sound Recording Industries | 1,212 |
| Heritage Institutions | 1,066 |
| Beverage and Tobacco Product Manufacturing | 1,023 |
| Clothing Manufacturing & Leather & Allied Product Manufacturing | 987 |

| | |
|---|---|
| Textile Mills & Textile Product Mills | 640 |
| Fishing, Hunting and Trapping | 96 |
| | 851,070 |

**Table 4.6**

**Proportion of workers below the required literacy skill level, by occupation, Alberta, 2006**

| Occupation | Percentage with shortage |
|---|---|
| Nurse Supervisors and Registered Nurses | 81% |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | 70% |
| Retail Salespersons and Sales Clerks | 69% |
| Professional Occupations in Business and Finance | 65% |
| Contractors and Supervisors in Trades and Transportation | 65% |
| Other Trades N.E.C. | 64% |
| Childcare and Home Support Workers | 63% |
| Assemblers in Manufacturing | 60% |
| Teachers and Professors | 56% |
| Technical and Related Occupations in Health | 55% |
| Supervisors in Manufacturing | 54% |
| Occupations in Protective Services | 54% |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | 52% |
| Professional Occupations in Art and Culture | 52% |
| Professional Occupations in Health | 51% |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | 50% |
| Professional Occupations in Natural and Applied Sciences | 50% |
| Construction Trades | 49% |
| Occupations in Travel and Accommodation Including Attendants in Recreation and Sport | 48% |
| Heavy Equipment and Crane Operators Including Drillers | 48% |
| Mechanics | 48% |
| Machine Operators in Manufacturing | 48% |
| Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C. | 48% |
| Sales and Service Supervisors | 47% |
| Chefs and Cooks | 47% |
| Machinists, Metal Forming, Shaping and Erecting Occupations | 47% |
| Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers | 45% |
| Technical Occupations Related to Natural and Applied Sciences | 44% |
| Clerical Occupations | 43% |
| Administrative and Regulatory Occupations | 42% |
| Assisting Occupations in Support of Health Services | 41% |
| Secretaries | 41% |
| Occupations in Food and Beverage Service | 39% |
| Sales & Service Occupations N.E.C. | 37% |

| | |
|---|---|
| Occupations Unique to Agriculture Excluding Labourers | 37% |
| Finance and Insurance Administrative Occupations | 37% |
| Clerical Supervisors | 37% |
| Technical Occupations in Art, Culture, Recreation and Sport | 37% |
| Other Managers N.E.C. | 35% |
| Senior Management Occupations | 34% |
| Labourers in Processing, Manufacturing and Utilities | 33% |
| Managers in Retail Trade, Food and Accommodation Services | 33% |
| Specialist Managers | 33% |
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | 33% |
| Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers | 30% |
| Cashiers | 24% |
| Primary Production Labourers | 22% |

**Source:** IALSS 2003, Census 2006 and ESP, 2008.

**Table 4.7**

**Numbers of workers below the required literacy skill level, by occupation, Alberta, 2006**

| Occupation | Number with shortage |
|---|---|
| Clerical Occupations | 76,026 |
| Retail Salespersons and Sales Clerks | 52,015 |
| Sales & Service Occupations N.E.C. | 46,413 |
| Professional Occupations in Natural and Applied Sciences | 37,511 |
| Teachers and Professors | 34,920 |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | 33,490 |
| Professional Occupations in Business and Finance | 30,081 |
| Construction Trades | 29,956 |
| Technical Occupations Related to Natural and Applied Sciences | 28,521 |
| Nurse Supervisors and Registered Nurses | 25,275 |
| Occupations Unique to Agriculture Excluding Labourers | 23,485 |
| Other Managers N.E.C. | 22,570 |
| Mechanics | 21,663 |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | 18,853 |
| Childcare and Home Support Workers | 18,851 |
| Administrative and Regulatory Occupations | 18,293 |
| Managers in Retail Trade, Food and Accommodation Services | 17,524 |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | 17,135 |
| Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers | 16,588 |
| Machinists, Metal Forming, Shaping and Erecting Occupations | 16,495 |
| Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C. | 16,309 |
| Specialist Managers | 15,396 |

| | |
|---|---|
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | 14,501 |
| Machine Operators in Manufacturing | 14,488 |
| Technical and Related Occupations in Health | 14,099 |
| Occupations in Protective Services | 13,778 |
| Contractors and Supervisors in Trades and Transportation | 13,244 |
| Chefs and Cooks | 11,901 |
| Occupations in Food and Beverage Service | 11,264 |
| Secretaries | 11,243 |
| Professional Occupations in Health | 10,608 |
| Finance and Insurance Administrative Occupations | 10,586 |
| Heavy Equipment and Crane Operators Including Drillers | 10,354 |
| Other Trades N.E.C. | 9,845 |
| Assisting Occupations in Support of Health Services | 9,766 |
| Technical Occupations in Art, Culture, Recreation and Sport | 9,437 |
| Professional Occupations in Art and Culture | 9,066 |
| Sales and Service Supervisors | 8,049 |
| Occupations in Travel and Accommodation Including Attendants in Recreation and Sport | 7,566 |
| Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers | 7,368 |
| Assemblers in Manufacturing | 6,854 |
| Cashiers | 6,735 |
| Senior Management Occupations | 6,447 |
| Labourers in Processing, Manufacturing and Utilities | 5,100 |
| Primary Production Labourers | 4,806 |
| Clerical Supervisors | 3,584 |
| Supervisors in Manufacturing | 3,111 |
| | 851,170 |

**Source:** IALSS 2003 and ESP, 2008.

**Table 4.9**

**The proportion of the employed labour force in skill shortage, balance and surplus by gender, Alberta, 2006**

| Employed Labour Force | | | | |
|---|---|---|---|---|
| Gender | Employment | Shortage | Balance | Surplus |
| | | Shortage | Balance | Excess |
| Male | 998650 | 48% | 23% | 29% |
| Female | 845550 | 45% | 23% | 32% |

**Source:** Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

**Table 4.10**

**The number and proportion of current employment in skill shortage and proportion of total group by immigrant status, Alberta, 2006**

| Employed labour force | | | | |
|---|---|---|---|---|
| Immigration status | Employment | Shortage | Balance | Surplus |
| Yes | 337950 | 59 | 21 | 20 |
| No | 1506250 | 43 | 24 | 33 |

**Source:** Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

**Table 4.11**

**The number and proportion of current employment in skill shortage, balance and surplus by age group, Alberta, 2006**

| Employed Labour Force | | | | |
|---|---|---|---|---|
| Age Group | Employment | Shortage | Balance | Surplus |
| 15-24 | 312650 | 44% | 24% | 32% |
| 25-34 | 391250 | 47% | 23% | 29% |
| 35-44 | 427250 | 52% | 23% | 25% |
| 45-54 | 434850 | 52% | 22% | 25% |
| 55-64 | 221550 | 57% | 21% | 21% |
| 65 + | 56650 | 64% | 18% | 18% |
| Total | 1844200 | 51% | 23% | 26% |

**Source:** Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

**Table 4.12**

**The proportion of current employment in skill status by aboriginal status, Alberta, 2006**

| | Employment | Shortage | Balance | Excess |
|---|---|---|---|---|
| Aboriginal status | | Percentage | | |
| Aboriginal | 77850 | 44 | 24 | 32 |
| Non-Aboriginal | 1766300 | 46 | 23 | 30 |

**Source:** Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

**Table 4.13**

**The proportion of the employed labour force in skill shortage, balance and surplus by official language, Alberta, 2006**

| | | Shortage | Balance | Excess |
|---|---|---|---|---|
| Mother tongue | | | Percentage | |
| English | 1474050 | 43 | 24 | 15 |
| French | 40150 | 50 | 23 | 25 |
| Multiple | 17600 | 50 | 23 | 35 |
| Other | 312300 | 60 | 21 | 30 |
| **Total** | 1844150 | **53** | **23** | **27** |

**Table 4.14**

**The proportion of current employment in skill shortage by urban density, Alberta, 2006**

| | **Employment** | Shortage | Balance | Excess |
|---|---|---|---|---|
| | | | Percentage | |
| Urban | 1604200 | 46 | 23 | 30 |
| Rural | 229650 | 44 | 23 | 32 |
| Reserve | 10350 | 51 | 22 | 26 |
| **Total** | 1844200 | **46** | **23** | **30** |

**Table 4.16**

**Likelihoods of being in prose literacy skill shortage, selected groups, 2006**

Table 4.16A Unadjusted likelihoods of being in prose literacy skill shortage, selected groups, Canada and Alberta, 2006

| Group | Unadjusted likelihood of being in | Unadjusted likelihood of being in |
|---|---|---|

| | literacy skill shortage-Canada | literacy skill shortage-Alberta |
|---|---|---|
| Immigration (Yes:No) | 185% | 151% |
| Gender ( Male : Female ) | 86% | 85% |
| Education (Less than high school) | 157% | 187% |
| Education ( High school only) | 96% | 113% |
| Education ( Trade certificate, diploma, apprentice) | 106% | 112% |
| Education ( College) | 92% | 96% |
| Education (university degree) | 100% | 100% |
| Age_16_25 | 42% | 47% |
| Age_26_35 | 52% | 62% |
| Age_36_45 | 60% | 67% |
| Age_46_55 | 62% | 69% |
| Age_56_65 | 79% | 84% |
| Age_65_Plus | 100% | 100% |
| Newfoundland | 143% | |
| PEI | 129% | |
| Nova Scotia | 110% | |
| New Brunswick | 149% | |
| Quebec | 147% | |
| Ontario | 139% | |
| Manitoba | 122% | |
| Saskatchewan | 94% | |
| Alberta | 106% | |
| British Columbia | 100% | |
| Mother_Tongue_Eng | 75% | |
| Mother_Tongue_Fre | 105% | |
| Mother_Tongue_Non | 151% | |
| Mother_Tongue_Mult | 100% | |
| CMA_YN | 111% | |

Table 4.16B Adjusted likelihoods of being in prose literacy skill shortage, selected groups, Canada, 2006

| | Adjusted liklihoods |
|---|---|
| Education (LT HS) | 190% |
| Nfld | 180% |
| NB | 167% |
| PEI | 159% |
| Immigration (Yes:No) | 154% |
| ONT | 140% |

| | |
|---|---|
| QUE | 134% |
| NS | 133% |
| MAN | 130% |
| Mother_Tongue_Non | 129% |
| Mother_Tongue_Fre | 120% |
| Education ( Training) | 117% |
| Education ( HS only) | 116% |
| ALTA | 116% |
| CMA_YN | 111% |
| SASK | 108% |
| Education (Degree) | 100% |
| Age_65_Plus | 100% |
| BC | 100% |
| Mother_Tongue_Mult | 100% |
| Education ( college) | 100% |
| Mother_Tongue_Eng | 88% |
| Gender ( Male : Female ) | 86% |
| Age_56_65 | 80% |
| Age_46_55 | 64% |
| Age_36_45 | 63% |
| Age_26_35 | 57% |
| Age_16_25 | 42% |

**Table 5.1**

**Estimated size of market segments and cost of providing remedial instruction, Alberta, 2006**

| Language and market segment | Number of potential learners | Cost of remedial instruction ($M) | Share of cost by market segment | Proportion of literacy shortage by market segment |
|---|---|---|---|---|
| | Number | Dollars | Percentage | Percentage |
| **English** | | | | |
| Latent A1 | 64,250 | $303 | 19% | 7% |
| Latent A2 | 53,650 | $121 | 8% | 6% |
| Latent B1 | 29,050 | $143 | 9% | 3% |
| Latent B2 | 25,550 | $154 | 10% | 3% |
| Latent C | 280,750 | $534 | 33% | 29% |
| Latent D | 303,750 | $261 | 16% | 32% |
| Latent E | 161,500 | $68 | 4% | 17% |
| Latent F | 39,800 | $13 | 1% | 4% |
| | 958,300 | $1,597 | | |
| **French** | - | | | |
| Latent A1 | - | $- | 0% | 0% |
| Latent A2 | - | $- | 0% | 0% |

| | | | | | |
|---|---|---|---|---|---|
| Latent B1 | - | $- | | 0% | 0% |
| Latent B2 | 550 | $- | | 0% | 0% |
| Latent C | 450 | $1 | | 0% | 42% |
| Latent D | 300 | $1 | | 0% | 35% |
| Latent E | - | $0 | | 0% | 23% |
| Latent F | | $- | | 0% | 0% |
| | 1300 | $2 | | | |
| **Total** | | **959,600** | **$1599** | | |

**Table 5.4**

**Estimated cost of eliminating literacy skill deficits, returns and rates of return on investment, selected industries, Alberta, 2006**

| | Cost of eliminating literacy skill shortages | Estimated return on investment | Estimated rate of return | |
|---|---|---|---|---|
| Industry | Millions of dollars | Millions of dollars | Percentage | |
| Retail Trade | | | | $1 |
| Food Services and Drinking Places | | | | $9 |
| Mining and Oil and Gas Extraction | | | | $9 |
| Transportation | | | | $8 |
| Trade Contracting | | | | $8 |
| Crop Production | | | | $7 |
| Prime Contracting | | | | $7 |
| Wholesale Trade | | | | $7 |
| Primary and Secondary Education | | | | $6 |
| Hospitals | | | | $4 |
| Ambulatory Health Care Services | | | | $3 |
| Architectural, Engineering and Design Services | | | | $3 |
| Repair and Maintenance | | | | $3 |
| Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin | | | | $2 |
| Building Services | | | | $2 |
| Food Manufacturing | | | | $2 |
| Social Assistance | | | | $2 |
| Nursing and Residential Care Facilities | | | | $2 |
| Personal and Laundry Services | | | | $2 |
| Federal Government Public Administration (including Defence Services) | | | | $2 |
| Real Estate | | | | $2 |
| Fabricated Metal Product Manufacturing | | | | $2 |
| Accommodation Services | | | | $2 |
| Monetary Authorities - Central Bank & Credit Intermediation and Related Activities | | | | $1 |
| Provincial and Territorial Public Administration | | | | $1 |
| Religious, Grant-Making, Civic, and Professional and Similar Organizations | | | | $1 |
| Amusement, Gambling and Recreation Industries | | | | $1 |
| Accounting and Tax Preparation | | | | $1 |
| Management, Scientific and Technical Services | | | | $1 |
| Machinery Manufacturing | | | | $1 |

| | |
|---|---|
| Insurance Carriers & Related Activities and Funds & Other Financial Vehicles | $1 |
| Utilities | $1 |
| Computer System Design Services | $1 |
| University Education | $1 |
| Wood Product Manufacturing | $1 |
| Legal Services | $1 |
| Furniture and Related Product Manufacturing | $1 |
| Broadcasting and Telecommunications | $1 |
| Private Households | $9 |
| Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets | $9 |
| Security Services | $9 |
| Non-Metallic Mineral Product Manufacturing | $7 |
| Plastics and Rubber Products Manufacturing | $7 |
| Printing and Related Support Activities | $7 |
| Other Schools and Educational Support | $7 |
| Performing Arts, Spectator Sports and Related Industries | $6 |
| Management of Enterprises and Other Administrative Services | $6 |
| Publishing Industries | $6 |
| Employment Services | $5 |
| Post-Secondary Education | $5 |
| Securities, Commodity Contracts, and Other Intermediation and Related Activities | $5 |
| Other Professional Services | $5 |
| Chemical Manufacturing | $4 |
| Business Services | $4 |
| Miscellaneous Manufacturing | $4 |
| Travelling Services | $4 |
| Forestry and Logging with support activities | $4 |
| Advertising and Related Services | $3 |
| Primary Metal Manufacturing | $3 |
| Waste Management and Remediation Services | $3 |
| Transportation Equipment Manufacturing | $3 |
| Computer and Electronic Product Manufacturing | $3 |
| Warehousing and Storage | $3 |
| Information Services and Data Processing Services | $2 |
| Electrical Equipment, Appliance and Component Manufacturing | $2 |
| Clothing Manufacturing & Leather & Allied Product Manufacturing | $2 |
| Paper Manufacturing | $2 |
| Heritage Institutions | $1 |
| Petroleum and Coal Products Manufacturing | $1 |
| Motion Picture and Sound Recording Industries | $1 |
| Beverage and Tobacco Product Manufacturing | $1 |
| Textile Mills & Textile Product Mills | $1 |
| Fishing, Hunting and Trapping | $0 |
| | $1 |

**Table 5.5**

**Estimated cost of eliminating literacy skill deficits, returns and rates of return on investment, selected occupations, Alberta, 2006**

| Occupation | Cost of eliminating literacy skill shortages | Estimated return on investment | Estimated rate of return |
|---|---|---|---|
| | Millions of dollars | Millions of dollars | Percentage |
| Sales & Service Occupations N.E.C. | | | |
| Clerical Occupations | | | |
| Transportation Equipment Operators and Related Workers, Excluding Labourers | | | |
| Retail Salespersons and Sales Clerks | | | |
| Occupations Unique to Agriculture Excluding Labourers | | | |
| Construction Trades | | | |
| Machine Operators in Manufacturing | | | |
| Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers | | | |
| Mechanics | | | |
| Professional Occupations in Natural and Applied Sciences | | | |
| Trades Helpers, Construction, and Transportation Labourers and Related Occupations | | | |
| Teachers and Professors | | | |
| Professional Occupations in Business and Finance | | | |
| Other Managers N.E.C. | | | |
| Nurse Supervisors and Registered Nurses | | | |
| Technical Occupations Related to Natural and Applied Sciences | | | |
| Machinists, Metal Forming, Shaping and Erecting Occupations | | | |
| Chefs and Cooks | | | |
| Childcare and Home Support Workers | | | |
| Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations | | | |
| Managers in Retail Trade, Food and Accommodation Services | | | |
| Administrative and Regulatory Occupations | | | |
| Specialist Managers | | | |
| Occupations in Food and Beverage Service | | | |
| Heavy Equipment and Crane Operators Including Drillers | | | |
| Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C. | | | |
| Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers | | | |
| Occupations in Protective Services | | | |
| Contractors and Supervisors in Trades and Transportation | | | |
| Secretaries | | | |
| Technical and Related Occupations in Health | | | |
| Assisting Occupations in Support of Health Services | | | |
| Technical Occupations in Art, Culture, Recreation and Sport | | | |
| Cashiers | | | |
| Finance and Insurance Administrative Occupations | | | |
| Other Trades N.E.C. | | | |
| Professional Occupations in Health | | | |
| Occupations in Travel and Accommodation Including Attendants in Recreation and Sport | | | |
| Sales and Service Supervisors | | | |
| Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers | | | |
| Professional Occupations in Art and Culture | | | |
| Primary Production Labourers | | | |
| Senior Management Occupations | | | |
| Assemblers in Manufacturing | | | |

| | |
|---|---|
| Supervisors in Manufacturing | $ |
| Clerical Supervisors | $ |
| Labourers in Processing, Manufacturing and Utilities | $ |
| | **$** |

**Table 5.9**

**Number and proportion of adults in skill shortage by low income status, Ontario, 2006**

| English Market segments | low-income adults aged 16 and over | Non-low income adults in shortage | Percent |
|---|---|---|---|
| A1 | 59650 | 5300 | 8.89% |
| A2 | 48850 | 7050 | 14.43% |
| B1 | 25750 | 1800 | 6.99% |
| B2 | 22850 | 3100 | 13.57% |
| C | 271000 | 24050 | 8.87% |
| D | 322500 | 26200 | 8.12% |
| E | 150600 | 9750 | 6.47% |
| F | 38300 | 1300 | 3.39% |
| Total | 939500 | 78550 | 8.36% |

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## Annex C: Methods

Annex C provides an overview of the methods that were used to derive literacy scores, literacy levels, market segments, literacy demand levels, remedial costs and estimated benefits of eliminating literacy skill shortages.

The overall goal of the analysis was to impute a literacy score for each individual on the 2006 Census of Population. In practice, scores were imputed for those individuals aged 16 and over on the Census2B short form that provides a 20% representative sample of the adult population aged 16 and over. The imputations were based on a selection of personal characteristics that are associated with literacy scores such as age, gender, education, mother tongue, immigration status, province and occupation.

Using the relationships revealed in the IALSS analysis determined the best estimate of an individual's literacy score and the chances that they would be at prose literacy levels 1, 2, 3, 4 or 5.

Using the relationships revealed in the ISRS the analysis assigned individuals to literacy market segments that are defined on the basis of patterns of strength and weakness observed over a battery of clinical reading assessments that evaluate the decoding and comprehension skills that are believed to underlie the emergence of fluid and automatic reading that characterizes prose literacy Level 3.

The analysis relied on individual records from three databases:

> The International Adult Literacy and Skills Survey (IALSS) for 2003.
>
> The International Survey of Reading Skills (ISRS) which was fielded in 2005 to a sub-sample of low skilled IALSS respondents, mostly those at prose literacy levels 1 and 2.
>
> The 2006 Census household and individual micro data files for Canada.

In a separate analysis levels of literacy demand were derived for each individual with an occupation code on the Census individual file by applying skill profile data provided by the Essential Skills project at Human Resources and Skills Development Canada (HRSDC).

Comparison of literacy skill demand levels to observed literacy proficiency at the individual level allows one to identify whether adults have literacy skills below, at, or above the level associated with satisfactory job performance in their occupation and provides a basis for estimating the costs and benefits that would be associated with eliminating any revealed skill deficits.

### Analysis of the IALSS Data

The IALSS data were used to perform a regression of prose literacy level on predictor variables. The regression was done for those individuals who had valid responses for all the variables of interest.

The dependent variable was the average of the 5 estimates of prose literacy provided by the IALSS file. The results of these regressions gave regression coefficients that were subsequently used to predict the likely literacy scores of individuals on the Census. Independent variables were selected that previous analysis had shown to be important predictors of literacy skill (Desjardins, 2004). Additionally independent variables had to be available on both the IALSS and Census and had to be codeable in a consistent fashion.

The regression coefficients are presented in the attached table… There were 20,366 observations in the regression and the resultant $R^2$ was 49%.

### Regression Analysis of Average Prose Literacy: Cofficient for Each Variable

**Compared to Reference Group**

| Variable | Coefficient | Variable | Coefficient |
|---|---|---|---|
| Intercept | 259.2 | Employed | 12.4 |
| Immigrants-Yes | -24.3 | Unemployed | 7.0 |
| Less than high school | -62.1 | Not in Labour Force | 17.3 |
| High school graduate | -31.9 | In a CMA in Newfoundland and Labrador | 9.4 |
| Trades certificate | -25.0 | In a CMA in Prince Edward Island | -8.6 |
| Post-Secondary | -13.3 | In a CMA in Nova Scotia | 0.1 |
| Degree | 0.0 | In a CMA in New Brunswick | 5.8 |
| Male compared to Female | 4.1 | In a CMA in Quebec | 6.8 |
| Age 16 to 25 | 45.5 | In a CMA in Otario | -6.3 |
| Age 26 to 35 | 35.3 | In a CMA in Manitoba | 4.3 |
| Age 36 to 45 | 29.1 | In a CMA in Saskatchewan | -0.9 |
| Age 46 to 5 | 28.9 | In a CMA in Alberta | -0.3 |
| Age 56 to 64 | 17.4 | In a CMA in British Columbia | 0.0 |
| Age 65 plus | 0.0 | Occupational Group A | 24.4 |
| Mother tongue English | 7.0 | Occupational Group B | 23.3 |
| Mother tongue French | -6.6 | Occupational Group C | 34.2 |
| Mother tongue non-official | -14.0 | Occupational Group D | 17.0 |
| Mother tongue-multiple | 0.0 | Occupational Group E | 29.7 |
| Newfoundland and Labrador | -28.1 | Occupational Group F | 22.8 |
| Prince Edward Island | -15.1 | Occupational Group G | 13.4 |
| Nova Scotia | -12.7 | Occupational Group H | 12.0 |
| New Brunswick | -23.8 | Occupational Group I | 8.4 |
| Quebec | -15.7 | Occupational Group J | 2.3 |
| Otario | -5.8 | | |
| Manitoba | -11.4 | | |
| Saskatchewan | -4.0 | | |
| Alberta | -6.2 | | |
| British Columbia | 0.0 | | |
| In a CMA? | -3.3 | | |

The IALSS data were used to conduct two additional regression analyses. First a regression analysis was conducted where the predicted and actual literacy of individuals was compared to the average literacy level of municipalities. More precisely the regression looked at the possibility of predicting the difference between actual and predicted literacy of individuals, based on the average literacy level for that person's Census Subdivision (CSD) (these tend to be municipalities). So the relationship sought here was between those with a literacy level better than expected (based on their characteristics) and the average literacy of their community (compared to the Canadian average). A hypothesis was that those in CSD's with higher than average literacy have a higher than expected literacy level.

**Regression Analysis of Individual Excess Literacy (over expected values) against Local Average Literacy**

| **Intercept** | **Local Average** |
|---|---|
| (118.09) | 0.429 |

This regression was higher significant (p < x%) with an R2 of X%.

These regression coefficients are used for imputing literacy scores on the 500 point IALSS prose literacy scale on to micro data records from the 2006 Census. The actual imputation was undertaken in two steps. First, literacy scores were imputed for each individual on the Census 2B file based on the personal characteristics. The initial imputation was then adjusted using average literacy scores calculated for each CSD. The latter adjustment captures geographic variation in literacy scores above and beyond that explained by the available by individual characteristics.

### Analysis of the ISRS Data

The ISRS study assessed the component reading skills of a sub-sample of IALSS respondents using a battery of clinical assessments of decoding and comprehension skills. The ISRS database provides detailed information on the component reading skills of those respondents with prose literacy levels of 1, 2 and 3 that the research suggests underlie the emergence of the fluid and automatic reading that characterizes Level 3 on the IALSS scales.

The ISRS data were used to perform a regression of prose literacy level on predictor variables. The regression was done for those individuals who had valid responses for all the variables of interest. The dependent variables were the probability of being in each of the eight market segments identified in analysis of patterns of strength and weakness over the available reading components (DataAngel, 2009). These regressions yielded regression coefficients that were subsequently used to predict the likely segment membership of individuals on the Census. Independent variables were selected that previous analysis had shown to be important predictors of segment membership, including age, gender, educational language, immigrant status and mother tongue (Sabatini, 2005). Additionally, independent variables had to be available on both the ISRS and Census and had to be codeable in a consistent fashion.

The sample size for the ISRS regressions was not large (total sample size was 1,XXX) and the regressions were done for the combinations of English/French and Levels 1 and 2. The regression coefficients though are being used with Census data to generate values which are summed over a large population.

These were used to create a series of latent classes:

A1:
A2:
B1:
B2:
C:
D:

A series of Logistic Regressions are used to estimate the probabilities of individuals being in these latent classes. The regression coefficients are based on the following variables.

**Regressions were used to estimate the coefficients for each of the following categories (English and French respondents at prose levels 1 and 2)**

| Langue | Latent class | Gender | Mother tongue English | Mother tongue French | Mother tongue non-official | Mother tongue multiple | Age 16-25 | Age 26 to 35 | Age 36 to 45 | Age 46 to 55 | Age 56 to 65 | Age 65 plus | Less than high school | High school grad or more |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **English** | | | | | | | | | | | | | | |
| Level 1 | A1 | 1.02 | 4.53 | 3.70 | - | - | 2.91 | 3.86 | 3.29 | 4.04 | - | - | 0.30 | 0 |
| Level 1 | A2 | 0.11 | 18.73 | 1.92 | - | - | 2.28 | 1.07 | 0.25 | 1.51 | - | - | 0.42 | 0 |
| Level 1 | B1 | 1 42 | 2.86 | 2.91 | - | - | 0.87 | 17.86 | 4.87 | 0.36 | - | - | 1.20 | 0 |
| Level 1 | B2 | 2.33 | 1.24 | 1.23 | - | - | 0.23 | 1.24 | 0.06 | 1.60 | - | - | 0.83 | 0 |
| Level 1 | C | 0.91 | 1.86 | 0.97 | - | - | 0.10 | 1.20 | 0.68 | 1.29 | - | - | 0.30 | 0 |
| Level 1 | D | 0.89 | 1.34 | 0.04 | - | - | 0.43 | 0.62 | 2.26 | 1.70 | - | - | 0.08 | 0 |
| Level 2 | A1 | 3.45 | 5.75 | 3.65 | 2.26 | - | 20.74 | 1.05 | 13.64 | 16.31 | - | - | 3.52 | 0 |
| Level 2 | A2 | 1.72 | 45.72 | 30.82 | 14.25 | - | 19.76 | 36.04 | 36.75 | 0.77 | - | - | 17.66 | 0 |
| Level 2 | B1 | 18.81 | 16.98 | 14.76 | 7.27 | - | 1.11 | 21.31 | 22.52 | 2.58 | - | - | 40.95 | 0 |
| Level 2 | B2 | 0.10 | 15.94 | 13.52 | 2.22 | - | 18.58 | 16.75 | 16.88 | 1.29 | - | - | 18.03 | 0 |
| Level 2 | C | 0.32 | 14.52 | 14.24 | 15.59 | - | 0.01 | 0.59 | 0.36 | 0.03 | - | - | 0.38 | 0 |
| Level 2 | D | 0.16 | 14.17 | 13.99 | 15.64 | - | 0.48 | 0.58 | 0.33 | 0.12 | - | - | 0.74 | 0 |
| **French** | | | | | | | | | | | | | | |
| Level 1 | A1 | 0.98 | 11.06 | 0.21 | - | - | 1.61 | 15.75 | 1.60 | 0.69 | - | - | 0.72 | 0 |
| Level 1 | A2 | 35.47 | 71.29 | 27.33 | - | - | 60.40 | 88.15 | 45.85 | 59.86 | - | - | 15.35 | 0 |
| Level 1 | B1 | 0.67 | 15.80 | 2.54 | - | - | 0.48 | 0.56 | 0.67 | 0.47 | - | - | 3.18 | 0 |
| Level 1 | B2 | 42.06 | 48.96 | 53.17 | - | - | 4.37 | 2150 | 2.51 | 19.91 | - | - | 0.93 | 0 |
| Level 1 | C | 0.42 | 10.56 | 3.51 | - | - | 0.33 | 0.94 | 1.03 | 0.50 | - | - | 0.17 | 0 |
| Level 1 | D | 1.33 | 9.67 | 1.45 | - | - | 0.51 | 4.36 | 0.20 | 1.17 | - | - | 0.78 | 0 |
| Level 2 | A1 | 030 | 1.13 | 15,93 | 0.71 | - | 17.63 | 0.42 | 15.68 | 16.83 | - | - | 0.69 | 0 |
| Level 2 | A2 | 17.41 | 21.15 | 20.35 | 9.99 | - | 0.97 | 0.88 | 19.19 | 9.75 | - | - | 0.42 | 0 |
| Level 2 | B1 | 0.80 | 51.82 | 39.39 | 50.89 | - | 0.91 | 1.58 | 0.21 | 0.71 | - | - | 2.14 | 0 |
| Level 2 | B2 | 0.10 | 15.94 | 13.52 | 2.22 | - | 18.58 | 1675 | 16.88 | 1.29 | - | - | 18.03 | 0 |
| Level 2 | C | 0.87 | 29.20 | 12.25 | 14.03 | - | 0.24 | 0.14 | 0.85 | 0.16 | - | - | 0.87 | 0 |
| Level 2 | D | 0.73 | 0.74 | 17.18 | 15.44 | - | 0.52 | 0.03 | 0.85 | 0.33 | - | - | 1.04 | 0 |

**Imputation of prose literacy scores**

Using Census microdata files the best estimate of prose literacy score was determined for each individual based on their individual characteristics; gender, age, education, language, immigration status mother tongue and province, by CMA resident or not.

After generating this best estimate and the adjustment was made for the local literacy level as described above.

Once the best estimate is determined, individual values are generated by simulating possible values using a normal distribution with mean equal to the best estimate and using a variance based on the Mean Squared Error of prediction. As well, a set of 25 possible literacy values were generated for each individual so one could determine the probability that they were at level 1, 2, 3, 4 or 5.

After imputation the imputed distributions of prose literacy and the proportions of the population at various literacy levels was compared to the IALSS results. The following chart and associated table reveals that the distribution of average literacy scores by occupation from the two sources are in close agreement. The figure reveals an $R^2$ of .82.

**Figure 2A**

**A comparison of the distribution of average literacy scores by occupation derived from the 2003 IALSS and imputed for the 2006 Census**

Figure B2 plots the average literacy scores derived from IALSS 2003 against those imputed for the 2006 Census by industry. The figure reveals that the level of agreement between the two sources is far lower, a fact that we believe is related to reporting differences between the two surveys.

**Figure 2B**

**A comparison of the distribution of average literacy scores by industry derived from the 2003 IALSS and imputed for the 2006 Census**

### Imputation of literacy market segments

For those who were assigned to prose literacy Level 1 or 2, an assignment was made to the literacy market segment segments A1, A2, B1, B2, C, D based on the logistic regressions described above.

For those who were at level 3 or 4 they were assigned to market segments E or F if their imputed literacy was short of the level of literacy than the Essential Skill level demanded for complex tasks. Latent Class ‘E’ was for those at literacy level 3 who needed level 4 or 5; class ‘F’ was for those at level 4 who needed level 5.

After imputation the proportion of the population imputed to be in various literacy market segments Classes was compared to the IALS results and were found to be in close agreement.

### Assignment of Essential Skills literacy demand levels

The HRSDC Essential Skills Research Program profiles the levels of skill that are associated with satisfactory job performance for the full range of occupations. The profiles establish demand benchmarks for nine skill domains, one of which prose literacy. The level of prose literacy skill demand provided by the Essential Skills Profiles were added to the Census data using the 4 digit occupation code available on both datasets. The literacy level for individuals in these occupations were compared to this demanded literacy level and assigned to one three categories; either short literacy, balanced or excess literacy. The category depended on whether their literacy was below, at or above the literacy level demanded.

Skill profiles are only available for a subset of occupations. Literacy skill demand levels were derived for un-profiled occupations by assigning the average literacy skill level of workers revealed in the IALSS dataset. IALSS occupation codes were grouped into 2 or 3 digit categories depending on the available sample sizes.

The inclusion of un-profiled occupations does not have a material impact on the analysis. As revealed in the following table profiled occupations accounted for 77% of total workers in literacy skill shortage in 2006 and 83% of total aggregate number of literacy points that would be needed to eliminate these shortages. Overall, the average point spread per worker is lower than those for profiled occupations. Moreover, un-profiled occupations were all assigned to demand Levels 2 and 3. The most significant impact of the un-profiled occupations on estimated skill shortages is for jobs demanding Level 3 skills where they account of 16% of the estimated number of workers in shortage and 12% of the aggregate literacy point spread. Thus, if anything, imputing the average demand levels for un-profiled occupations reduces the size of estimated skill shortages slightly.

**Table A1**

**Comparison of profiled and un-profiled occupations, Canada, 2006**

| | Peak proficiency level | Number of demanded employed workers in literacy skill shortage | Percentage of employed workers in literacy skill shortage | Aggregate point spread required to eliminate literacy skill shortage | Percentage of Aggregate point spread needed to eliminate sliteracy skill shortages | Average point spread per worker under complex demand |
|---|---|---|---|---|---|---|
| | | | Percent | | Percent | |
| **Un-profiled occupations** | 2 | 558,172 | 7 | 277,238 | 5 | 15 |
| | 3 | 1,273,759 | 16 | 668,640 | 12 | 20 |
| | 4 | - | 0 | - | 0 | - |
| | 5 | - | 0 | - | 0 | - |
| | **Total** | **1,832,582** | **23** | **986,376** | **18** | **19** |
| **Profiled occupations** | 2 | 104,119 | 1 | 47,688 | 1 | 12 |
| | 3 | 2,723,837 | 34 | 1,705,837 | 31 | 31 |
| | 4 | 2,319,714 | 29 | 1,797,692 | 32 | 52 |
| | 5 | 1,122,417 | 14% | 1,053,132 | 19 | 76 |
| | **Total** | **6,273,854** | **77** | **4,619,447** | **83** | **43** |
| Total | 2 | 662,467 | 8 | 336,848 | 6 | 15 |
| | 3 | 3,998,347 | 49 | 2,388,393 | 43 | 27 |
| | 4 | 2,319,714 | 29 | 1,797,692 | 32 | 52 |
| | 5 | 1,122,458 | 14 | 1,053,170 | 19 | 76 |
| | **Total** | **8,110,584** | **100** | **5,577,023** | **100** | **35** |

Occupation codes are only available for individuals who were employed at the time of the Census or who worked at some point in the previous five years. In keeping with previous analysis a literacy skill demand level of Level 3 was assigned to those individuals who had not worked in the past 5 years (CCL, 2008; DataAngel, 2009).

The HRSDC ES profiles provide two skill demand levels – the levels typically demanded by the occupation and the level demanded occasionally. The latter level is also known as the complex or peak level of demand. In both cases, the profile provides a range of skill levels that are associated with the tasks that define the occupation.

### Estimates of the earnings return to literacy

Estimates of the increase in earnings that might be expected were literacy skill shortages eliminated through the provision of remedial instruction were derived using a regression analysis. Here earnings levels were regressed against the difference between actual and predicted literacy scores. Figure B2 below displays the average earnings of individuals by literacy level after adjusting for the background characteristics that were employed in the regression analysis. Thus, the figure displays the marginal return to additional literacy skills. The figure is interesting in that it confirms that earnings premia are relatively stable across the entire range of literacy skill demand.

**Table B2**

**The earnings return to literacy after adjusting for predicted literacy levels**

This regression found that for every one point increase in actual literacy score, given the predicted literacy score, average earnings increased by about $155.

This value is used in the analysis to estimate the likely increases in earnings that might be expected if one increased the literacy scores of individuals by the number of prose literacy points required to eliminate the gap between observed skill and the lower bound of the proficiency level demanded by their occupation.

## Annex D: Acknowledgements

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