Understanding Literacy Markets in Canada: A Segmentation Analysis

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Foreword

The following report has been produced by DataAngel Policy Research Incorporated under contract to the Strategic Policy Branch at Human Resources and Skills Development Canada.

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 are available from the authors.

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All errors and omissions are those of the authors.

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). Canada's high level of dependence on inter-provincial and international trade implies that literacy skills will influence economic prospects more than many other countries.

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 results of the analysis are striking.

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

Literacy demand in Canada

Canada is one of the few countries in the world that can measure both the labour market demand for literacy skill and the supply of literacy skill at a detailed industrial and occupational level. Human Resources and Skills Development Canada's Essential Skills Profiles provide two measures of literacy skill demand – a level that workers typically need to undertake their work successfully and a more demanding complex level that they need occasionally. Data from the 2003 International Adult Literacy and Skills Survey (IALSS) and the 2006 Census provide data on the supply of literacy skill for workers in various industries and occupations. Comparison of these data allows for focused analysis of literacy skill shortages and surpluses. Where they exist literacy skill shortages reduce the level of labour productivity and constrain the performance of the economy at the macro level.

Workers who do not have the literacy skills to meet the complex or peak level of literacy skill demand will be less productive. At peak demand the Canadian economy generates a demand equivalent to 4.6 billion points on the IALSS literacy proficiency scale.

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.

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%.

The level of peak demand literacy skill per worker in Canada is relatively high, falling at Level 3 on the IALSS proficiency scales. Judged on a per employed worker basis, the Canadian economy demands an average literacy of 287 points at peak demand.

The demand for literacy skill by literacy proficiency level under peak demand conditions is as follows:

56% of Canada's peak literacy demand is at Level 3.

At peak demand 14% of Canada'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

Labour markets function best when literacy skill supply and demand are in rough balance. The rates at which literacy skill demand and supply are changing will determine whether skill shortages grow or shrink over time. 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 workers that will be shed by employers will have relatively low skills, well below the level needed by the newly created jobs.

The prospect of rising literacy skill demand begs the question of whether domestic and/or international sources of skill will be able to supply the needed skill.

Recent changes in employment on the demand for literacy skill in Canada

Changes in Canada'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. Increasingly jurisdictions will have to compete for the skill needed to meet their needs.

The supply of literacy in Canada

The aggregate supply of literacy skill in Canada is large with Canadians aged 16 and over possess just under 7 billion literacy points. Employed Canadians possess 4.6 billion literacy points.

Fully 6,992,000 adults, or 43% of employed workers, possess prose literacy skills at IALSS prose literacy Levels 1 and 2, and 5,040,000 or 32% have Levels 4 or 5.

An estimated 1,157,000 Canadian adults in the experienced labour force (i.e. those who are not currently employed but who worked in the 5 years prior to the Census), or 50%, have prose literacy skills at Levels 1 and 2. This proportion is 7% more than is evident in the employed population, 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 87% Canada has a reasonably high utilization ratio of occupationally-experienced workers, a fact that suggests that there is room for employers to draw occupationally-experienced workers 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

Literacy skill shortages will grow in size if the growth in the literacy skill supply can't satisfy the rising demand forecast above.

In Canada the absolute numbers of adults with skills below Level 3 is projected to grow by 996,950 from 2006 to 2016, an increase that reduces the proportion of adults with skills below the average level of demand by only 1%.

Projected changes in the supply of literacy skill vary significantly among jurisdictions, a finding that implies a need for a differentiated policy response.

The proportion of adults whose skill level is judged to place them at risk remains virtually unchanged out to 2016.

In Newfoundland the absolute numbers of adults with skills below Level 3 is projected to decline from 186, 755 to 179,175 from 2006 to 2016, or 4.1%. The Newfoundland population is forecast to drop by 3.2% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

In PEI the absolute numbers of adults with skills below Level 3 is projected to increase from 48.462 to 49,780 from 2006 to 2016, or 2.7%. The Island population is forecast to grow by 6.8% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 2%.

In Nova Scotia the absolute numbers of adults with skills below Level 3 is projected to increase from 48.462 to 49,780 from 2006 to 2016, or 2.7%. The Nova Scotian population is forecast to grow by 6.8% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 2%.

In New Brunswick the absolute numbers of adults with skills below Level 3 is projected to decrease from 295, 366 to 295,038 to 49,780 from 2006 to 2016, or 328 adults or .1%. The New Brunswick population is forecast to grow by 2.5% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

In Quebec the absolute numbers of adults with skills below Level 3 is projected to increase 95,086 from 3,360,840 to 3455926from 2006 to 2016, or 2.8%. The Quebec population is forecast to grow by 5.7% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

In Ontario the absolute numbers of adults with skills below Level 3 is projected to increase 599,043 from 4,703,029 to 5,302,072 from 2006 to 2016, or 12.7%. The Ontario population is forecast to grow by 16.3% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

In Manitoba the absolute numbers of adults with skills below Level 3 is projected to decrease 2489 from 421,302 to 418, 812 from 2006 to 2016, or -.6%. The Manitoba population is forecast to grow by 4.3% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 2%.

In Saskatchewan the absolute numbers of adults with skills below Level 3 is projected to decrease 17,124 from 346,178 to 329,055 from 2006 to 2016, or almost 5%. The Saskatchewan population is forecast to shrink by 1.4% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 2%.

In Alberta the absolute numbers of adults with skills below Level 3 is projected to increase from 1,094,669 to 1,232,588 from 2006 to 2016, or 12.6%. The Alberta population is forecast to grow by 16.3% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

In BC the absolute numbers of adults with skills below Level 3 is projected to increase 186, 181 from 1,604,379 to 1,790,560 from 2006 to 2016, or 11.6%. The BC population is forecast to grow by 12.9% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

In Yukon the absolute numbers of adults with skills below Level 3 is projected to decrease 327 from 8,662 to 8,335 from 2006 to 2016, or 3.8%. The Yukon population is forecast to shrink by 7.7% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to grow by 2%.

In NWT the absolute numbers of adults with skills below Level 3 is projected to increase 658 from 12,140 to 12,799 from 2006 to 2016, or 5.4%. The NWT population is forecast to grow by 6.0% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 3%.

In Nunavut the absolute numbers of adults with skills below Level 3 is projected to increase 1571 from 9,239 to 10,810 from 2006 to 2016, or 17%. The adults population in Nunavut is forecast to grow by 22.8% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to grow by 1%.

Collectively these findings imply that the Canadian economy will not be able to depend on domestic supply to meet the rising literacy skill intensity of employment implied in the COPS projections and recent changes in the occupational distribution of employment. 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 market for literacy

At the Canada level an average of only 66 percent of the available aggregate literacy supply was being used in 2006. The proportion of aggregate literacy supply that gets used varies considerably by jurisdiction. Newfoundland utilizes the lowest proportion of the aggregate supply at peak demand (53%) whereas Alberta utilizes the highest (71%). Jurisdictions with higher utilization rates will have more 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.

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. This suggests that the macro-economic performance of the economy is being constrained by a net 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.

Aggregate 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.

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

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 Canada.

Comparing literacy skill demand to supply by the proficiency level demanded by the job shows that:

- There is a significant surplus of workers with Levels 1 and 2 literacy skills, 3,577,099 and 1,168,854 respectively.

- The greatest shortage is of Level 3 workers, 4,943,610 workers in total.

- There is slight shortage of 530,383 Level 4 workers.

- There is a small surplus of 727,990 Level 5 workers

Comparing literacy skill demand to supply by proficiency level demanded by the job using literacy points reveals a slightly different picture:

- When worker skills are matched to job demands over all jobs Canada has an aggregate literacy skill surplus of 46,141,950 points, or roughly 35 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 Canada 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 Canada. Canadian workers in Level 2 jobs possess 94,317,300 more points of literacy than required under peak demand. This represents an average surplus of 15 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 Canada. Canadian workers in Level 3 jobs possess 79,613,100 more points of literacy than required under peak demand. This represents an average surplus of 27 literacy points per worker in Level 3 jobs, an amount associated with roughly one year of education.

- Canadian workers in Level 4 jobs lack a total of -124,455,600 literacy points, an average shortage of 52 points, roughly equal to the literacy skill gain associated with two additional years of education.

- Canadian workers in Level 5 jobs lack a total of -95,616,750 literacy points, a skill deficit that represents an amount of 76 points per employee, roughly equivalent to the additional literacy normally gained through three additional years of education.

  Overall 51% of employed Canadian workers are in literacy skill shortage assuming peak demand levels. The proportion of workers in shortage varies significantly by occupation, from a low of 20% to a high of 81%.

The largest shortages in absolute terms are found in clerical, retail and sales and service occupations. Interestingly several of the occupations that exhibit the highest proportions of workers in shortage are ones in the public sector that demand the highest skill levels. The elimination of shortages in these occupations might serve to increase the productivity of these workers and of the health and education sectors overall.

17 Canadian occupations function with 50% or more of their employees with literacy levels below that demanded by their jobs at peak level:

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%

Three sector councils – the Tourism Human Resources Sector Council, the Construction Sector Council and the Food Industry Sector Council account for almost ¼ of all workers in literacy skill shortage.

The social dimension of literacy skill shortages in Canada

Some groups of workers in the Canadian economy face much higher risks of being in literacy skill shortage.

Men and women in Canada 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 52% v.s. 50%.

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. 28% of employed women in Canada have surplus literacy skills v.s. 25% for men.

Immigrants in Canada face a 15% higher risk of being in skill shortage than their non-immigrant peers. 63% of immigrants in the experienced labour force are in skill shortage compared to 48% of their non-immigrant peers.

Literacy skill shortages in Canada's employed population are high for all age groups, ranging from a low of 43% to a high of 64%.

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

47% of employed aboriginal adults in Canada are in literacy skill shortage, a slightly lower risk of being in skill shortage than their non-Aboriginal peers – 47% v.s. 51%.

Non-official language adults face much higher levels of risk of being in literacy skill shortage than their official language peers. For example, 63% of these "other language" adults in the employed labour force are in skill shortage v.s. 46% of their English-speaking peers.

Looking at the relative likelihoods of being in literacy skill shortage across groups reveals that workers with less than a high school education face the highest unadjusted risks of being in literacy shortage, 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 to be in shortage. University-educated workers aged 65 and over with multiple mother tongues residing in British Columbia are less likely to be in shortage than any other group.

Workers differ over a broad range of characteristics including age, gender, education, immigrant status, aboriginal status and mother tongue. Adjusting for these characteristics allows one to look at the impact of single variables have on the risk of being in literacy skill shortage. This analysis 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 all other jurisdictions face higher levels of risk than their British Columbia 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.

Size of literacy market segments in Canada

The total literacy market in Canada, as defined by the demand for literacy skill generated by the labour market, includes 9,308,600 potential learners who are in literacy shortage.

7,192,200 potential learners, or 77% of the literacy market in Canada are in English segments.

2,116,400 potential learners, or 23% of the literacy market in Canada are in French segments.

The English literacy market in Canada is distributed over 8 market segments as shown below:

Language and market segment	Number of potential learners	**Proportion of literacy shortage by market segment**
English		
Latent A1	440,450	6%
Latent A2	565,400	8%
Latent B1	206,350	3%
Latent B2	262,050	4%
Latent C	2,112,850	29%
Latent D	2,253,000	31%
Latent E	1,092,100	15%
Latent F	260,000	4%
Total potential English learners	**7,192,200**	**100%**

50% of workers in English literacy skill shortage in Canada are classified in literacy market segments D, E and F. 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, only 50% of adults in English literacy skill shortage in Canada have discernible weakness in their decoding and comprehension skills – the traditional target of literacy programs in Canada.

12% of the English literacy market in Canada is classified in market segments A2 and B2, the two classes dominated by immigrant women.

The French literacy market in Canada is also distributed over 8 market segments as shown below:

Latent Class	Number of potential learners	Proportion of literacy shortage by market segment
French		
Latent A1	108,600	5%
Latent A2	24,750	1%
Latent B1	177,300	8%
Latent B2	41,550	2%
Latent C	721,800	34%
Latent D	680,450	32%
Latent E	291,600	14%
Latent F	70,350	3%
Total potential learners in French	**2,116,400**	**100%**
Total learners both languages	**9,308,600**	

49% of workers in French literacy skill shortage in Canada 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.

51% of workers in French literacy skill shortage in Canada have discernible weakness in their decoding and comprehension skill.

Only 3% of the French literacy market in Canada is classified in market segments A2 and B2, the two classes dominated by immigrant women. This proportion is 9% smaller than in the English literacy market in large measure because a much larger proportion of these immigrants have French as a mother tongue.

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.

Over all English market segments in Canada in literacy skill shortage 9.6% have incomes below Statistics Canada's low income cut-offs, a low enough proportion to suggest that government finance may not be needed to precipitate high enough levels of participation and investment.

However, the proportion of low-income adults in Canada varies considerably by English market segment, from a high of 17.4% for A2 and 18% for B2 – the two segments dominated by immigrants) to a low of 3.7% (F).

Over all French market segments in Canada in literacy skill shortage 8.7% have incomes below Statistics Canada's low income cut-offs, a low enough proportion to suggest that government finance may not be needed to precipitate high enough levels of participation and investment.

However, the proportion of low-income adults in Canada varies considerably by French market segment, from a high of 24.1% for A2 and 16.4% for B2 – the two segments dominated by immigrants- to a low of 3.5% (F).

Conclusion

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

Several important conclusions may be drawn from this evidence.

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

The aggregate supply of literacy skill in Canada is larger than demand by a considerable margin but much of the available supply goes untapped. Policies aimed at increasing the aggregate demand for both labour and literacy skill would yield economic benefits.

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. Thus, unless new sources of literacy supply are tapped literacy skill shortages will grow.

The Canadian economy appears to be relatively inefficient in the sense that it does not make full use of the available supply of literacy skill. The Canadian economy uses only 66% of the aggregate supply available in the province. Aggregate utilization rates vary significantly by jurisdiction from a high of 71% in Alberta to a low of 53% in Newfoundland and Labrador. In theory, jurisdictions could increase their GDP levels by increasing their aggregate utilization rates. This would involve adopting measures to increase the demand for literacy skill.

At the Canada level current employment demands 101% of the aggregate literacy skill possessed by employed workers. Thus, the level of GDP could be increased if occupationally-experienced workers could be recruited or existing workers trained to eliminate this aggregate shortage. The aggregate literacy utilization rate of employed workers varies by jurisdiction from a high of 104% in Nova Scotia and New Brunswick to a low of 93% in the Yukon and Northwest Territories. Jurisdictions with literacy surpluses have a huge untapped economic potential and would benefit from policies to increase the level of literacy skill demand in their economies, particularly in jobs that currently demand Level 2 literacy skill. Jurisdictions with aggregate literacy shortages would benefit from policies that serve to increase the available supply of occupationally-experienced workers with the requisite levels of skill. This could be achieved through selective immigration, adult upgrading or inter-jurisdiction migration.

The economic potential of the Canadian economy is also constrained by the fact that an average of 51% of workers have literacy skill levels below those needed to do their jobs well.

Eliminating literacy skill shortages in Canada would be expensive. Such an investment would, however, generate sufficient additional earnings to yield very high rates of return on investment. 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 annual benefits could be as high as $32.6 billion in increased earnings (DataAngel, 2009).

The simple magnitude of these potential returns justifies 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 Canada 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 in literacy upgrading but almost certainly not rapidly enough to avoid lots of short term economic pain. Faced with large numbers of low-skilled workers Canadian firms will chose to outsource production, will try to reduce labour costs or will simply be unable to compete. So realizing Canada'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). Canada's high level of dependence on international trade implies that literacy skills will influence economic prospects more than many other countries.

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.

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 a failure 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 Canadian 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 Canada's labour markets 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.

The report attempts to answer a series of fundamental questions, including:

What groups of Canadian 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 Canada?

Which industries and occupations have the highest proportions of workers with inadequate literacy skills?

Which groups of Canadian 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 Canada. 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 Canadian economy. These latter two analyses show that literacy skill demand is expected to grow rapidly. These data provide a context for evaluating whether expected sources of literacy skill supply will be able to satisfy rising demand and, by extension, whether the skill shortages documented in Chapter 4 will grow with time.

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 Canada 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 numbers of workers in different segments of the literacy market and a more nuanced profile of the learning needs of adults with levels of literacy skill below that indicated by the Essential Skills profiles as needed by the job.

Chapter 6 summarizes the study's main findings and provides readers with an interpretation of what the findings imply for public policy.

The report is supported by three 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.

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 (ES) 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 higher 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. Data presented in Annex C indicates that this approach has little, if any material impact on the analyses as presented.

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 or complex level in this report. In the aggregate complex levels of literacy demand exceed typical demand by roughly 8%. This increase translates into 20.6 literacy points per worker on the IALSS/ES proficiency scales, an amount equal to 41% of an IALSS/ES proficiency level. Given that the average literacy point spread between workers skill levels and the complex level identified by the ES profiles is 35 applying the typical level of demand would reduce the depth of shortage but would have little impact on the estimated numbers of workers in shortage. Thus, the choice of complex level does not have a material impact on the estimated size of literacy skill shortages. The ES profiles also identify a range of

skill levels that are associated with satisfactory job performance. The current analysis uses the highest skill level demanded by the job. The choice of the most demanding level of literacy skill demand is justified by the impact that skill shortage will have on labour productivity levels in a period when the demand for literacy skill is expected to rise and literacy supply to remain flat. Adopting the less demanding typical level would presume that there are no costs associated with workers failing to deal with the most difficult reading demands of their jobs, no matter how infrequent. An analogy is useful here. Viewed from the perspective of the frequency of tasks firemen need only to be able to eat and sleep. Occasionally, however, they are asked to carry people out of burning buildings – something that requires a high level of strength and skill. In the theory of skill this taps the dimension of criticality i.e. tasks that are critical to job performance but which arise infrequently.

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 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 are the only comprehensive source of information on literacy skill demand in Canada. The ES profiles depend on very small purposive samples of jobs in each occupation. As such there is no guarantee that they provide statistically representative estimates. The assignment of the levels of literacy skill demand in ES profiling exercise are based upon task descriptions that have higher inter-profiler reliabilities but have not been empirically validated using large representative samples of jobs. Thus, the estimates of literacy skill demand, and associated estimates of skill shortages, should be interpreted as indicative, rather than definitive. We believe that these weaknesses do not have a material impact on the conclusions presented in this report as any bias would involve shifting an entire proficiency level.

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 Canada

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 250 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 (also referred to in this report as the typical level) and an occasional level (also referred to in this report as peak or complex demand).

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 Canada

Figure 2.1 presents two estimates of the aggregate level of literacy skill demand for reading text at the Canada levels expressed in literacy points. 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 for prose literacy is calculated using the score at the lower threshold of the indicated proficiency level on the IALSS 500 point scale. More specifically, the estimates are derived by multiplying the score at the lower threshold of the indicated proficiency level for each occupation by the level of employment observed for that occupation in the 2006 Census and then summing aggregate values across occupations. For example if an occupation occasionally demands that workers read Level 3 texts then an estimate of aggregate peak demand for that occupation would be calculated by multiplying the number of workers in the occupation by 275, the lower bound of Level 3 on the IALSS scale. Repeating the process for each occupation and summing yields an aggregate estimate of demand expressed in literacy points.

Using the lower bound of the indicated proficiency level gives estimates that represent the minimum demand for prose literacy skill that prevails in the Canadian labour market. Using the mid-point of the indicated level or the top of the indicated level would yield higher aggregate demand estimates and would thus increase the skill shortages reported in Chapter 4. Comparison of aggregate demand estimates to aggregate supply estimates derived by multiplying either the number of workers, the number of occupationally experienced workers or the total population aged 16 and over allows one to compare how efficiently the labour market is making use of the current supply of literacy skills. The calculation of aggregate estimates of literacy supply and demand is enabled by the nature of the IALSS proficiency scales. The statistical methods used to summarize IALSS proficiency scores, and that define the scales that underpin the ES profiles, are quasi-interval scales (see text box below). Scale points on the 500 point scale are all the same size and allow for aggregation. As such they are a human capital equivalent of financial capital, the former denominated in literacy points, the latter denominated in dollars.

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About the IALSS scales

The analyses presented in this report are based on the 500 point IALSS prose literacy scale.

Ideally, these scales would be interval scales that would allow for comparison across the entire range of skill. In reality the IALSS scales are quasi-interval scales. The Item response theory models that are used to summarize proficiency were derived from a normal ogive model, one that yields a non-linear standardization of scores.

The idea of 'doubling' a score from 150 to 300 is a property of a ratio scale, which the IALSS scales did not initially support. Because the score of 0 was an arbitrary setting, doubling an IALS score is like doubling the temperature in Celsius. The ratio of scores was initially meaningless (e.g., 5 degrees C is not infinitely warmer than 0 degrees C). The IALSS quasi -interval scales can be transformed into ratio scales provided that one assumes that the lower bound of the scale is, in fact, real. Although there is no way to prove or disprove that the scales display interval or ratio properties the available evidence does provide strong support for treating the scales as if they were interval scales. Specifically, the letter and word recognition data from the ISRS study provides strong support for the notion that the lower bound of IALSS scale scores does indeed represent a true zero threshold i.e. a complete absence of literacy. Similarly, the fact that very few individuals manage to get all of the most difficult IALSS test items correct suggests that the upper bound of the scale represents a true maximum level of skill for the construct that is being measured.

So the inference structure for using the IALSS scales does not prohibit the expression of “doubling”, one just has to be careful with the resulting interpretation of findings. Provided that one is reasonably sure of the lower threshold one can say that the difference between one set of group means are twice of the difference of two other group means. In this respect temperature scales offer good examples of the duplex nature of scales i.e. “doubling” of temperature is meaningless for F and C but it is meaningful for K since there is the absolute zero.

Adding and subtracting scores also makes sense with the IALSS scales. All scales with a sufficiently large number of distinct scores and a normal distribution are called quasi-interval, because one has no way to prove or disprove if they are interval, but they function as if they are.

Similarly, multiplying literacy scores by population weights to derive estimates of aggregate supply and demand are supported by quasi-interval scales. Using literacy scores to measure the stock of human capital, the aggregates would have the same properties as the original scale: averages make sense, but sums make less sense (unless you are comparing sums calculated from the same number of units, which is just like a rescaled average). Using the analogy of temperature, just as it is reasonable to compare the expected temperature of two cities, or compare the change in temperature in one city with the change in temperature of another city, we can also characterize literacy of nations the same way.

Within those interpretations, one can come estimate literacy stocks and flows, but, literacy is slightly different from the traditional economic interpretations of stocks and flows that are denominated in dollars. Interestingly, although the sum of scores for a country by itself does not make much sense, the population average is the expected value of individuals. So if one wanted to estimate the stock of an asset, one simply multiplies the number of units with the expected individual value. For literacy, this product is equal to the original sum of scores of all people, which is where you started out. Accounting also works a little differently, inflows and outflows in literacy skills are the result of birth, death, immigration, schooling, etc., and not by transformation of or into other forms of capital. It acts as a multiplier in terms of facilitating the translation of other forms of capital and is itself a corollary of capital (like zero point energy). Using aggregate literacy measures a country with 1 billion of people with the average of 200 would have the same stock of literacy as a country with 500 million of people with the average of 400 but the economic value of the stock would be quite different depending upon non-linearities in the returns to literacy skill and in the underlying distribution of literacy skill demand.

The Item response theory (IRT) methods employed to generate proficiency scores, particularly the use of multiple imputations, handle the issue elegantly, because the scale is not artificially bounded and individual measurement error is reflected in the dispersion of the multiple imputations. So, if a test cannot accurately place a high scorer, then his or her estimate is spread across a wider range.

An irony here is that classical scores have both interval and ratio properties, because their increments are test items. The down-side is that the interpretation of those scores relies on the equivalence of all test items to each other and that the interpretation is always fixed to specific test, not to a general domain of literacy. These problems only go away as the test length approaches infinity, at which point they scores look like IRT estimates anyways, but with a known 0 point.

Any analysis looking at classical scores (which theoretically support both ratio and interval interpretations as length approaches infinity) with IRT scores will show similar results. With shorter tests, the relationship between the two score estimates will be distinctly S-shaped, with the classical scores truncating the range. As the length increases, the relationship becomes more linear, and becomes truly linear as length goes to infinity. Interestingly, the relationship between IRT scores estimated from a representative sub sample of items from a long test and the classical score estimated using all items is also linear, which suggests that any IRT score is an estimate of the classical score of an infinite-length test. The remaining limitations are that one still won't know exactly where the true 0 should be, and the measurement error for fixed-length tests is greater around the extremes.

Because of the varying measurement error for individual scores, any analysis that treats a quasi-interval scale as merely ordinal will have more inferential errors than an analysis that treats them as interval.

The degree of effort required to move a person along the scale does differ according to location, but that is an issue related to the nature of literacy, not of the scale. If one were to interpret a study suggesting the cost or effort required to move somebody x number of scale points, one could safely assume that this is an average effect for the population under analysis and would interpret the results accordingly. The marginal cost at each level of literacy is different, and if one wanted the marginal cost for a specific level of literacy or set of learning needs one would design the research accordingly by restricting the my analysis to that level. Analysis of the ISRS data has revealed that the unit cost of raising different groups of learners varies significantly. The cost estimates presented in this volume take into account both the number of score points that would be required to close any literacy skill shortage and where along the distribution of scores these shortages are themselves distributed.

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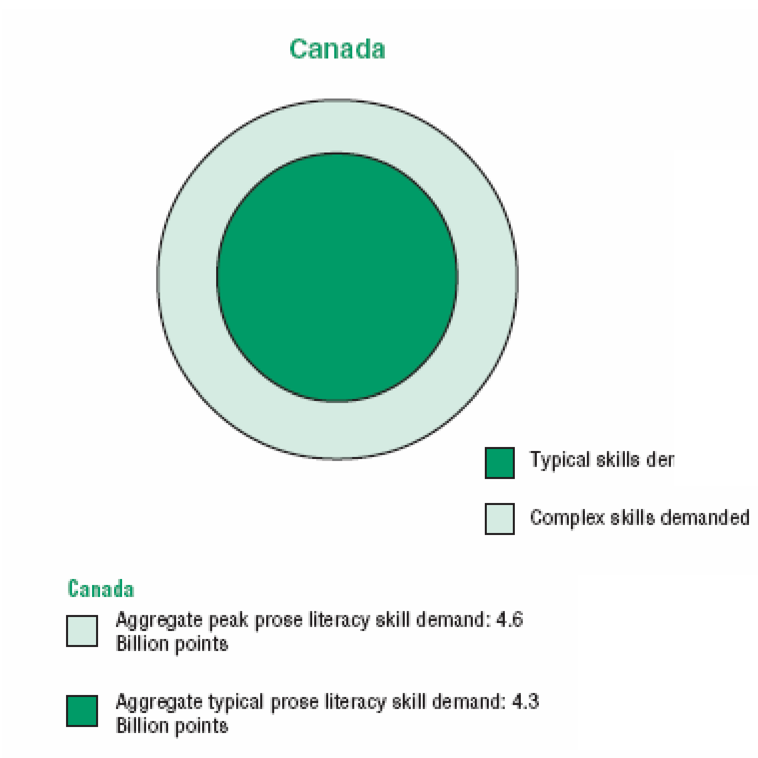
The selection of the lower bound of the proficiency level is a crucial one for the current analysis as it is the level that is used to define literacy skill shortages. The lower bounds of the typical and occasional ES proficiency levels were selected as they yield the lowest estimates of aggregate literacy demand that satisfy the ES-defined constraint. Adopting the mid-point or upper bound of the indicated ES proficiency level would result in much higher levels of aggregate literacy skill demand and, ultimately, much larger literacy skill shortages.

In order to provide results for the entire workforce demand levels had to be derived for the occupations that have yet to be profiled. One of the barriers to progress in the area of literacy has been the mistaken impression that literacy skill shortages are something that only apply to the low-skilled end of the labour market. Thus, a decision was taken to assume the average skill level of job holders in the occupation revealed by the analysis of IALSS data. This approach assumes that the market for skill for un-profiled occupations is in rough equilibrium i.e. that on average job incumbents possess the level of literacy skill demanded by their jobs. As a result the literacy skill surpluses and shortages derived by comparing skill supply and demand for these occupations are based on the distributions of actual skill around the observed average and may under or over-estimate the true size of the associated skill shortages. At a minimum the data will be useful in establishing priorities for which occupations should be profiled. Ultimately using the average skill level for un-profiled occupations is likely to under-estimate the size of reported literacy skill shortages slightly. Evidence in support of this contention is presented in Annex C.

Figure 2.1

The implied aggregate economic demand for prose literacy skills, adults aged 16 and over, Canada, 2006



The figure reveals several important facts, including:

The typical economic demand for prose literacy skill in Canada is relatively high, falling toward the upper regions of Level 2. 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.

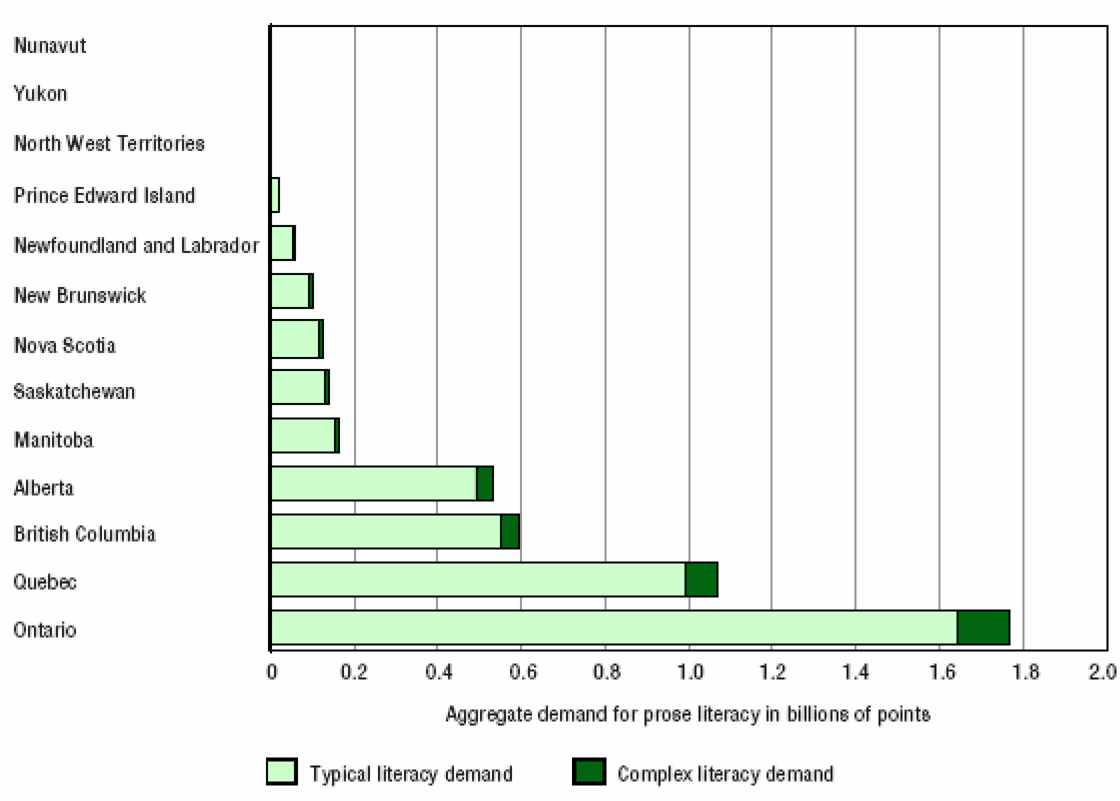
Occasionally workers are required to apply a much higher level of skill. The ES profiles suggest that peak demand increases the demand for prose literacy skill by roughly 328 million points to 4.6 billion, an increase of 8%. Peak demand implies a need for an average prose literacy skill of an estimated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

As noted above 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



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.

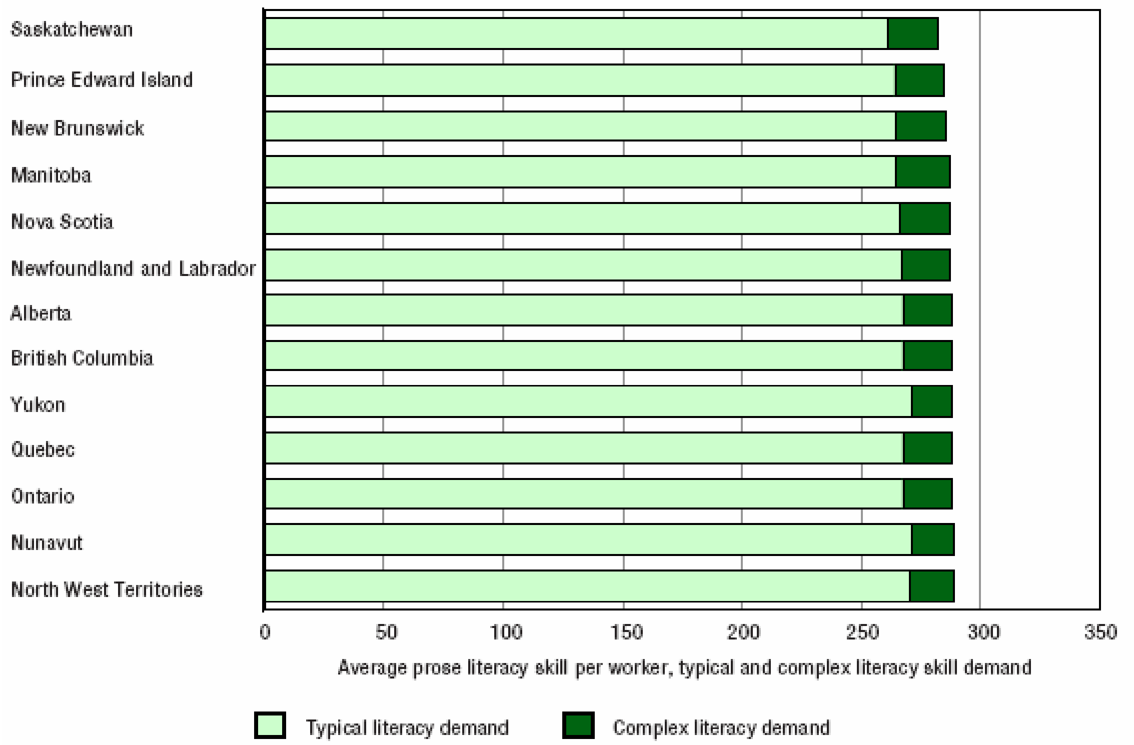
Jurisdictions differ in their levels of peak prose literacy skill demand. In most provinces peak aggregate demand exceeds the level of typical demand by typical by 8%.

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



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 in the lower regions of 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.

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

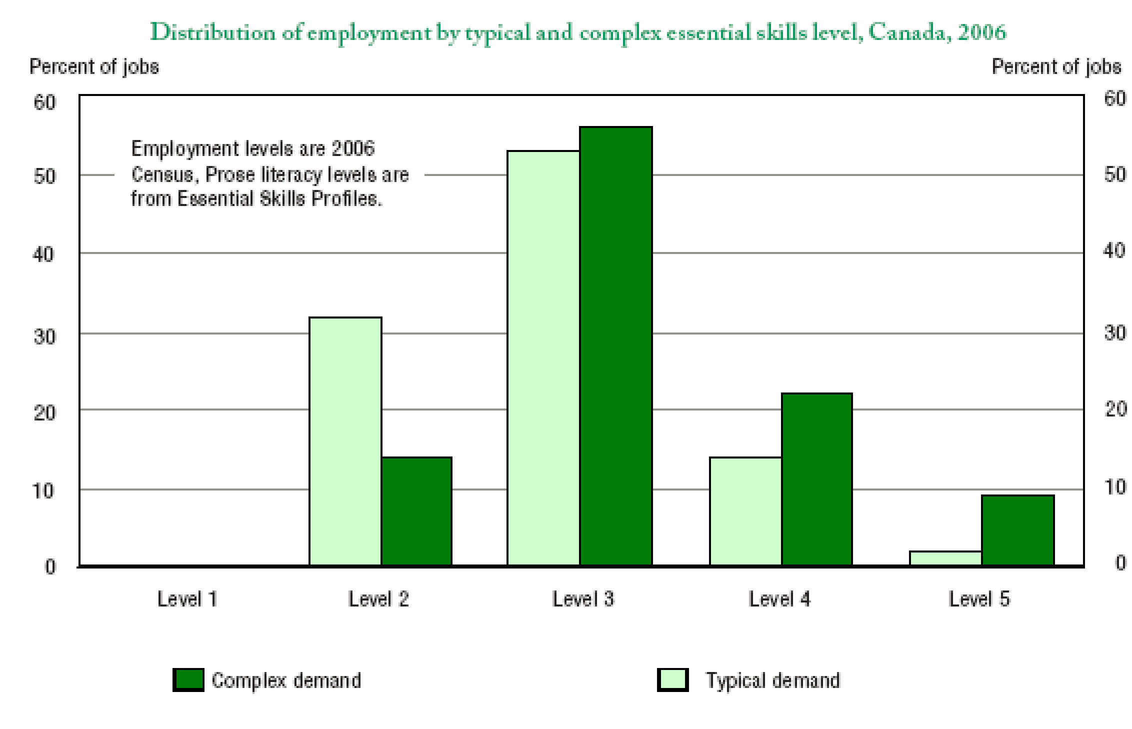
Levels	Prose	Document
Level 1 (0-225 points)	Most of the tasks in this level require the respondent to read relatively short text to locate a single piece of information that is identical to or synonymous with the information given in the question or directive. If plausible but incorrect information 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 is denominated in jobs, Figure 2.4B in aggregate demand in literacy points.

Figure 2.4.A

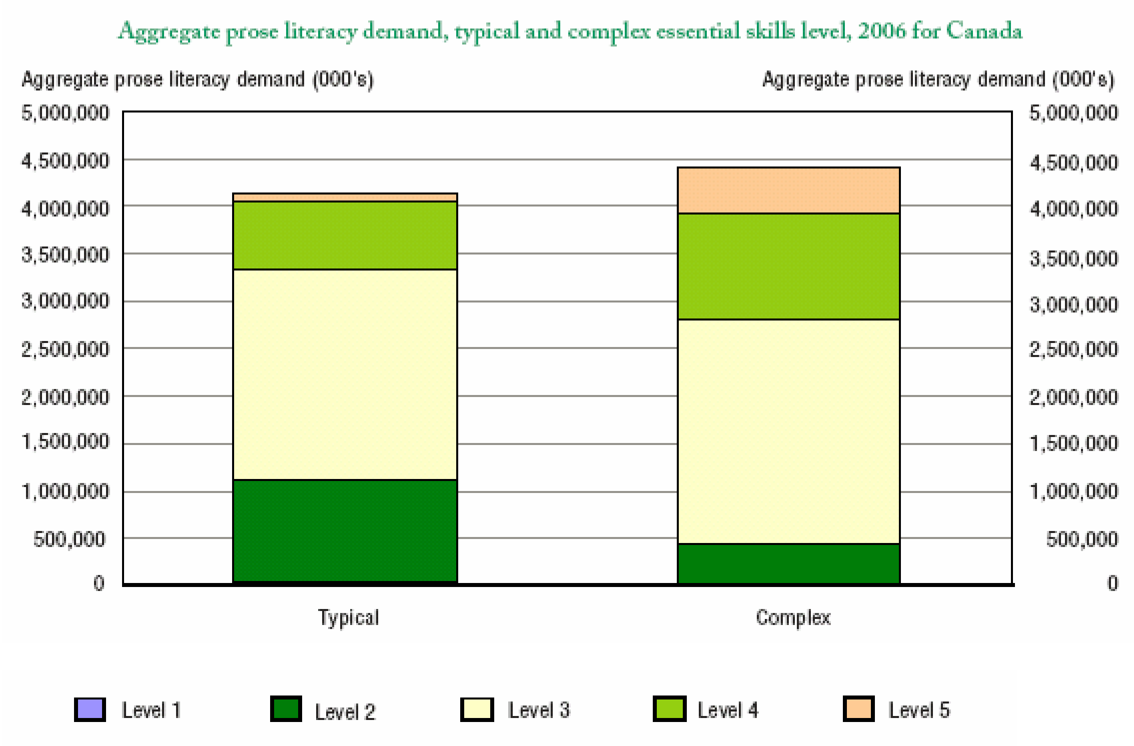
The distribution of aggregate literacy skill demand by proficiency level, typical and complex, Canada, 2006



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.B

The distribution of aggregate literacy skill demand by proficiency level, typical and complex, Canada, 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 most notably that the aggregate demand for literacy skill at level 2 falls dramatically under peak demand and 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.

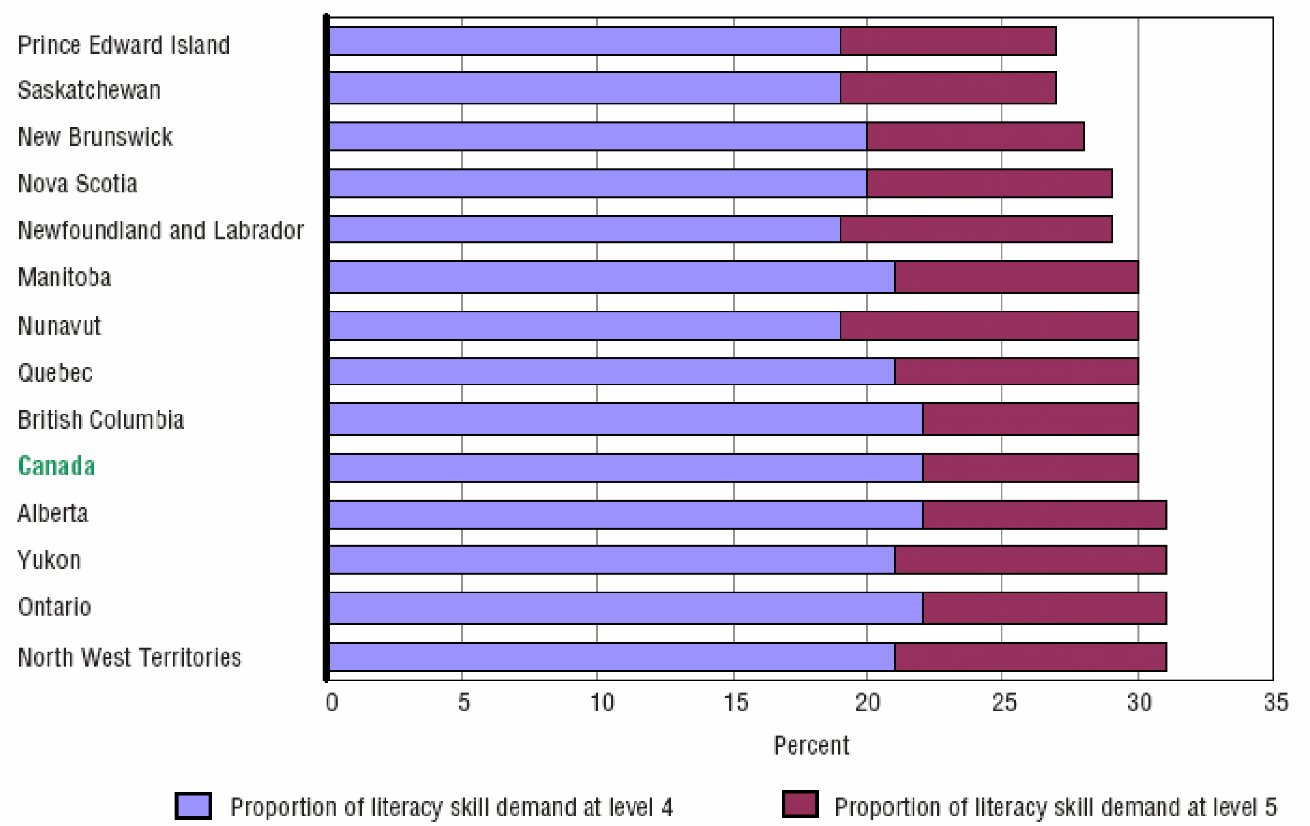
These findings raises interesting questions for policy including the degree to which having such a large proportion of employment below Level 3 might be constraining GDP growth and what might be done to increase the level of skill demand in the economy.

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:

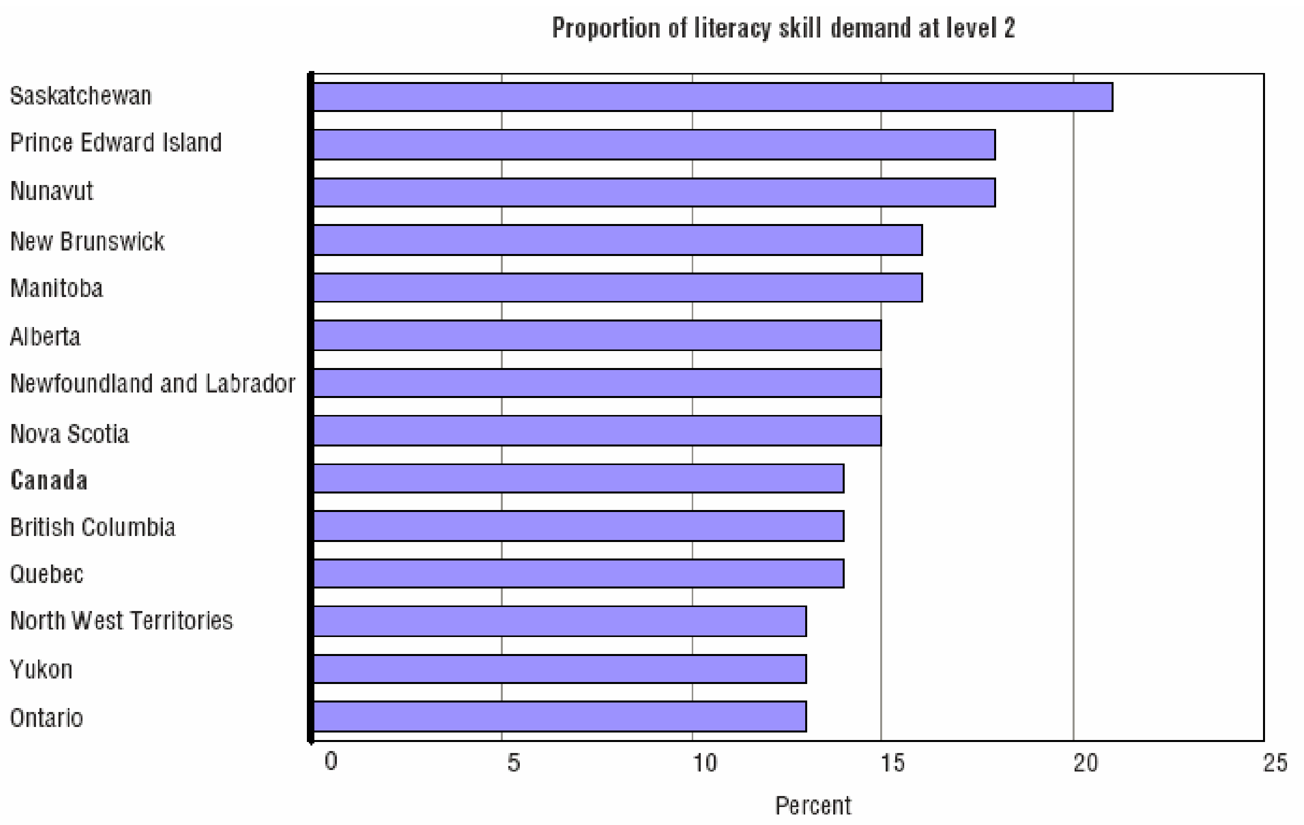
30% of jobs at the national level require Level 4 and 5 prose literacy skill under peak demand conditions.

The figure reveals the presence of small differences among jurisdictions.

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.

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.

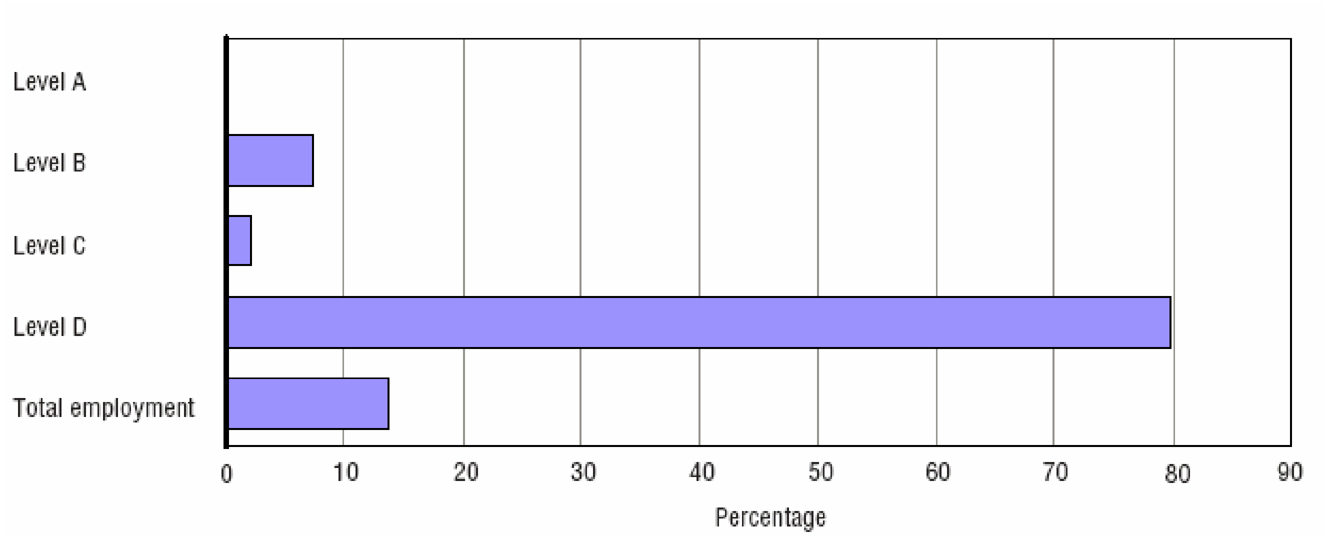
Level B occupations generally require two to three years of post-secondary education at a community college, institute of technology or CEGEP *or* two to five years of apprenticeship training *or* three to four years of secondary school and more than two years of on-the-job training, specialized training 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, Canada, 2006



Source: HRSDC ES Profiles 2008 and the 2006 Census of Population.
Occupation levels are sorted by the proportion of employment at Levels 1 or 2.

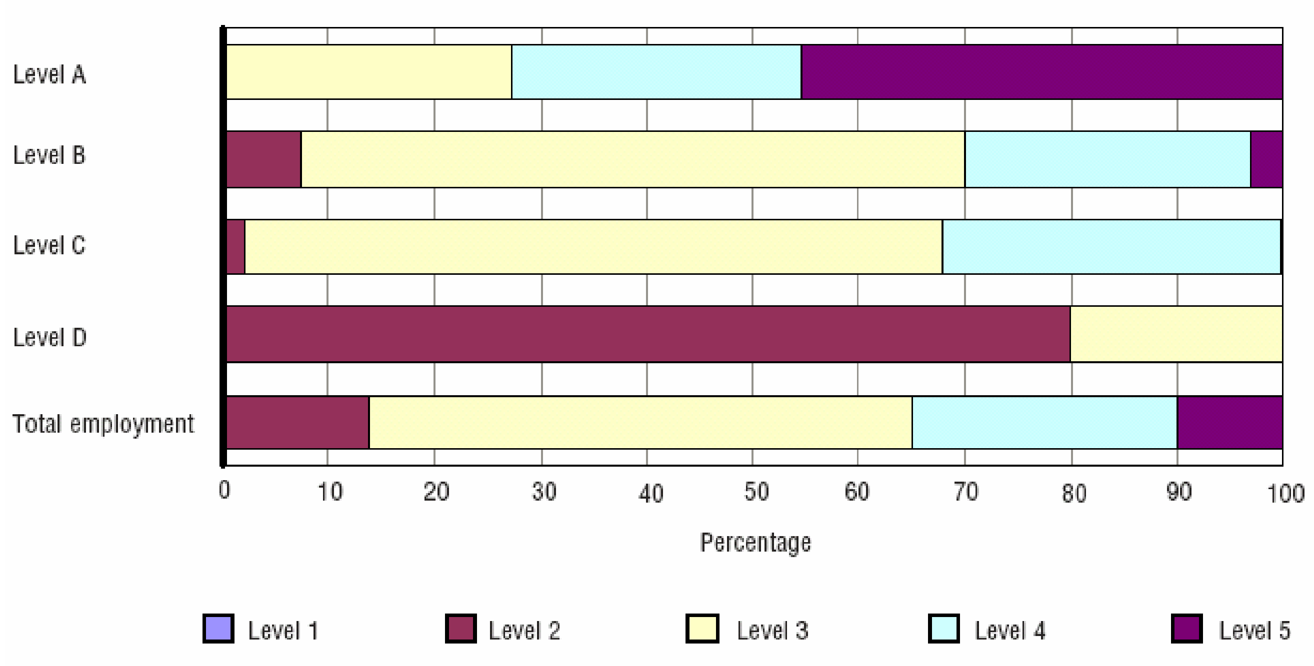
As expected the data confirm that occupations in those levels that require higher levels of formal education generally require higher levels of literacy. Over 80% of Level D demand is at Levels 1 and 2.

Notwithstanding this general observation, however, the relationship is far from perfect. One sees small proportions 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.

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, Canada, 2006



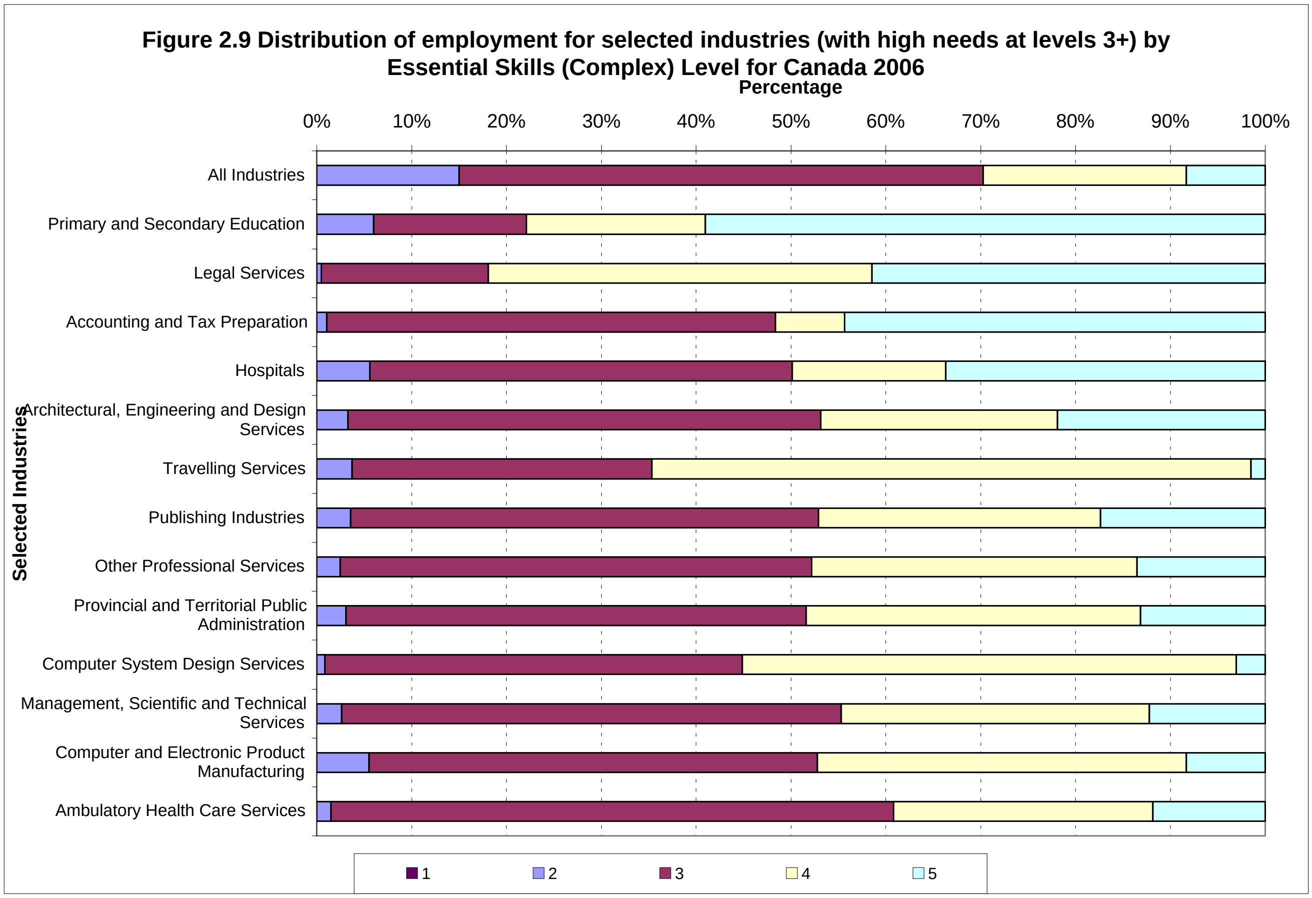
Source: HRSDC ES Profiles 2008 and the 2006 Census of Population.

The figures reveal interesting differences in the distribution of literacy skill demand by occupational level.

Figure 2.9 presents the distribution of literacy demand in selected high literacy demand industries for Canada.

Figure 2.9

Proportion of total employment by literacy skill demand level, selected high demand industries, Canada, 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.

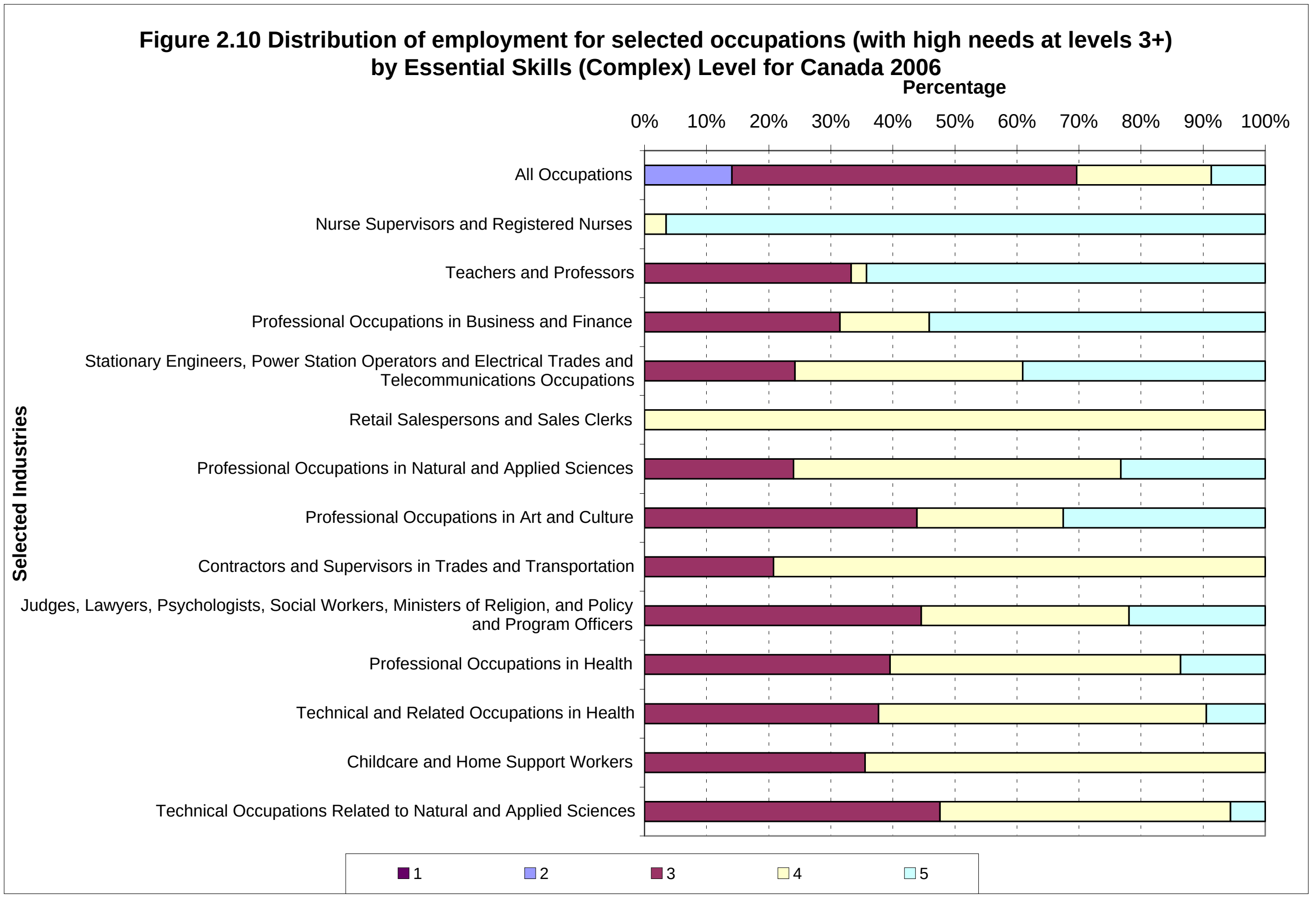
The figure reveals that industries differ markedly in their distributions of literacy skill demand.

Some industry groups, including those plotted above, demand relatively large proportions of workers with Level 3 or higher skills. Not surprisingly the primary and secondary industry demands the highest level of Level 3, 4 and 5 skills.

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

Figure 2.10

Proportion of total employment by literacy skill demand level, selected occupations, Canada, 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 levels of literacy skill.

Several other 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. The basic question of interest is whether changes in the distribution of employment by occupation will increase the demand for literacy skill, will leave the level of demand unchanged or will decrease the demand for literacy skill.

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

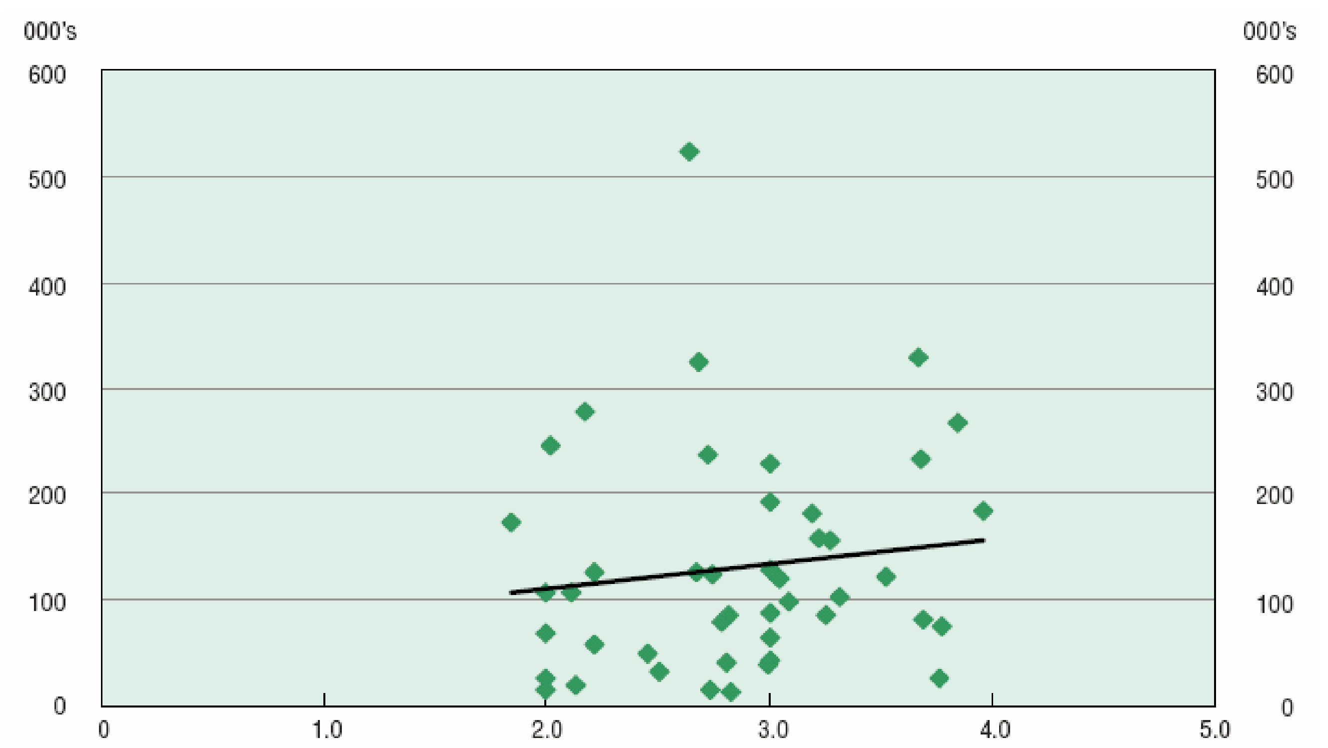
If job gains are concentrated in occupations that demand high levels of literacy skill then employers in the industries that employ those occupations will have difficulty finding workers. Job gains in low skill demand occupations will likely be relatively easy for employers to fill.

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 Canada level demand projections.

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:

- 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.
- 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%**	

S

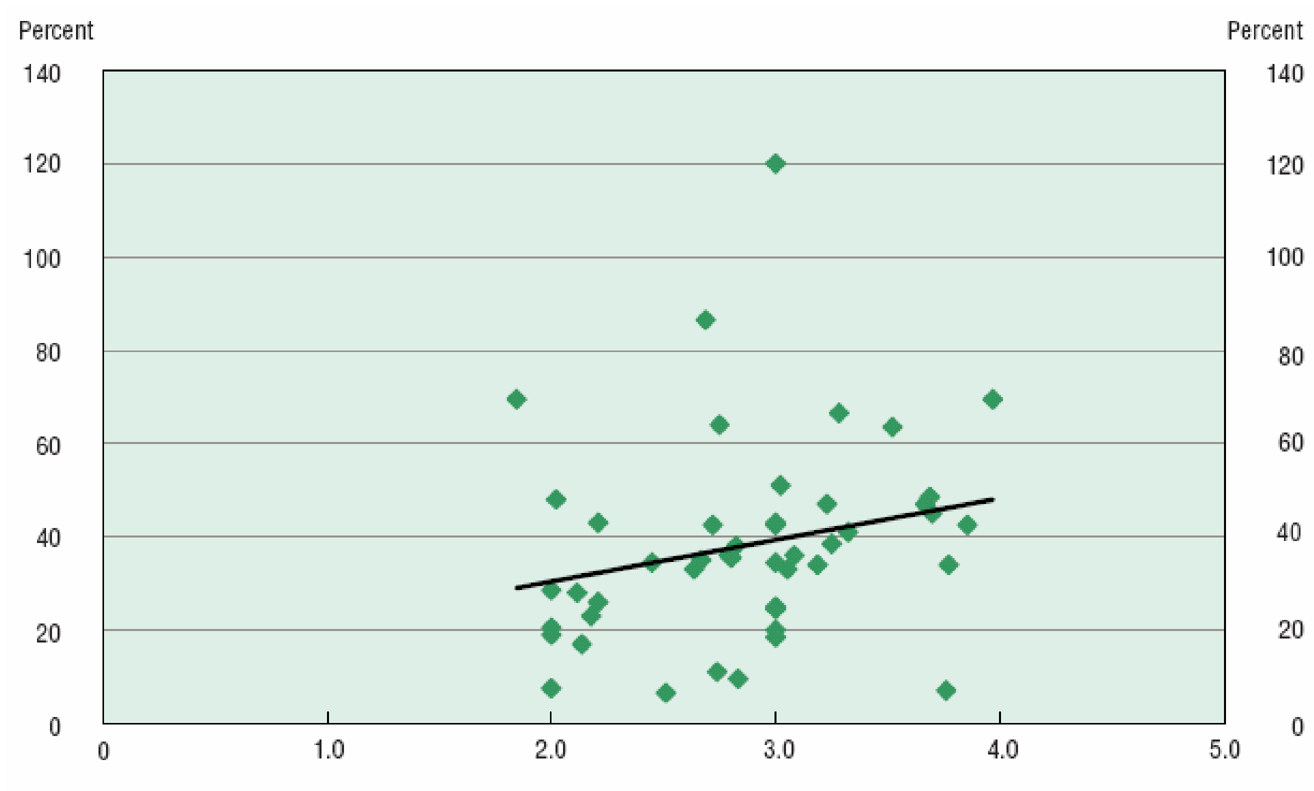
ource: COPS, 2006 Census and ES profiles

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



Source: COPS, 2006 Census and ES profiles

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

S

ource: COPS, 2006 Census and ES profiles

Assuming that the COPS projections are reasonable approximations of expected shifts in the distribution of employment by occupation then it would seem that the demand for literacy skill will rise rapidly over the coming decade, a finding that begs the question of whether likely increases in te supply of literacy skill will be able to meet these demands.

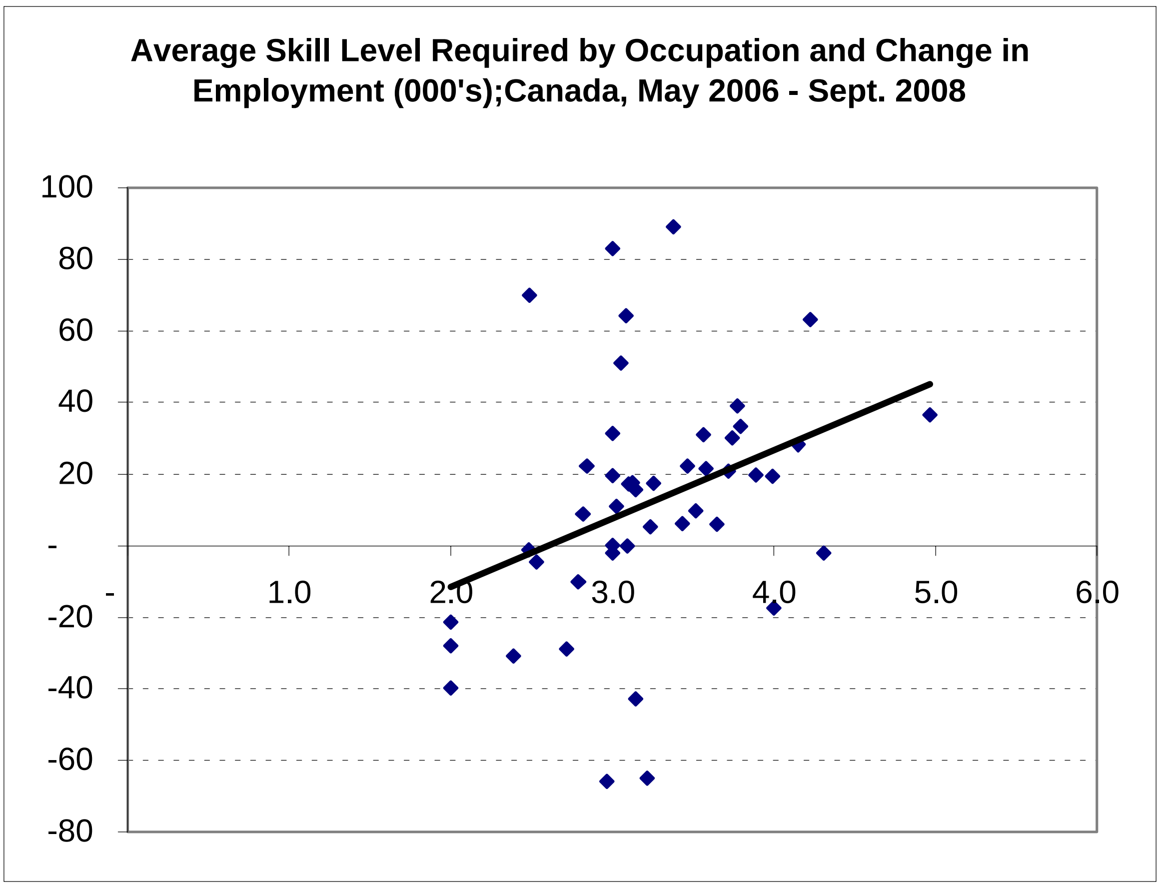
2.3 Recent changes in employment and their impact on the demand for literacy skill

The COPS estimates employed in the forgoing analysis are somewhat dated and are generally publicly 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 in the demand for literacy skill.

It is also possible that recent turmoil in Canada's labour markets have altered the demand for literacy skill in significant ways that are not reflected in the COPS projections. Figures 2.13 and 2.14 uses data from the monthly Labour Force Survey to plot the actual changes in employment by occupation observed since May 2006, the reference date of the 2006 Census. 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

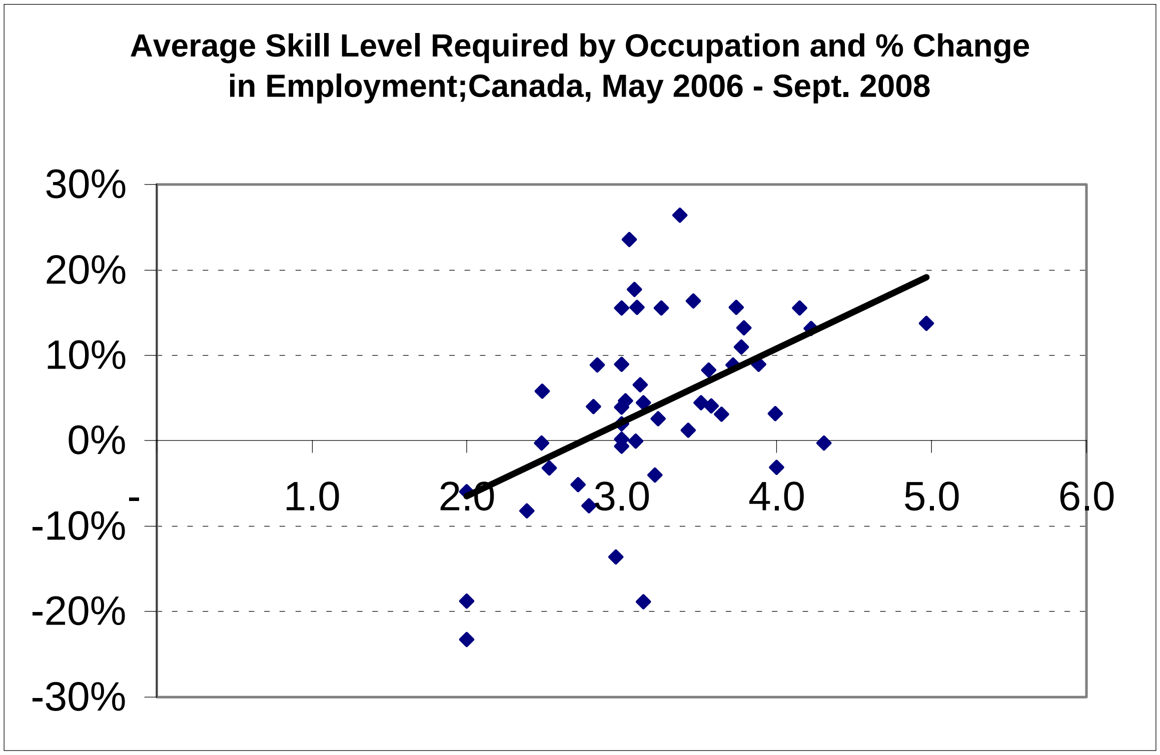
Actual aggregate job gains and losses by average literacy skill demand, selected occupations, May 2006 to September 2008, Canada



Source: LFS.

Figure 2.13B

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



The figures reveal several important facts, including that changes in Canada'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. 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 Canada.

10 highest ranked occupations for Canada percentage growth in employment

Rank	Occupation	Percent change in employment	Average literacy skill demand
1	Administrative and Regulatory Occupations	26%	3.4
2	Sales and Service Supervisors	24%	3.1
3	Construction Trades	18%	3.1
4	Other Trades N.E.C.	16%	3.5
5	Professional Occupations in Health	16%	3.7
6	Heavy Equipment and Crane Operators Including Drillers	16%	3.1
7	Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	16%	4.1
8	Other Managers N.E.C.	16%	3.0
9	Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	16%	3.3
10	Nurse Supervisors and Registered Nurses	14%	5.0

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

10 highest ranked occupations for Canada growth in employment

Rank	Occupation	Change in employment	Average literacy skill demand
1	Administrative and Regulatory Occupations	89,100	3.4
2	Other Managers N.E.C.	83,000	3.0
3	Sales & Service Occupations N.E.C.	69,900	2.5
4	Construction Trades	64,200	3.1
5	Professional Occupations in Business and Finance	63,100	4.2
6	Sales and Service Supervisors	51,000	3.1
7	Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	39,000	3.8
8	Nurse Supervisors and Registered Nurses	36,500	5.0
9	Contractors and Supervisors in Trades and Transportation	33,200	3.8
10	Specialist Managers	31,300	3.0
	Total projected growth in employment	560,301	3.4
	Total as a percent of 2006 employment	153.5%	

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 Canada in proportional and absolute terms.

10 lowest ranked occupations for Canada percent growth in employment

Rank	Occupation	Percent change	Average literacy skill demand
47	Primary Production Labourers	-23%	2.0
46	Assemblers in Manufacturing	-19%	3.1
45	Labourers in Processing, Manufacturing and Utilities	-19%	2.0
44	Machine Operators in Manufacturing	-14%	3.0
43	Occupations Unique to Agriculture Excluding Labourers	-8%	2.4
42	Supervisors in Manufacturing	-8%	2.8
41	Cashiers	-6%	2.0
40	Managers in Retail Trade, Food and Accommodation Services	-5%	2.7
39	Clerical Occupations	-4%	3.2
38	Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	-3%	2.5

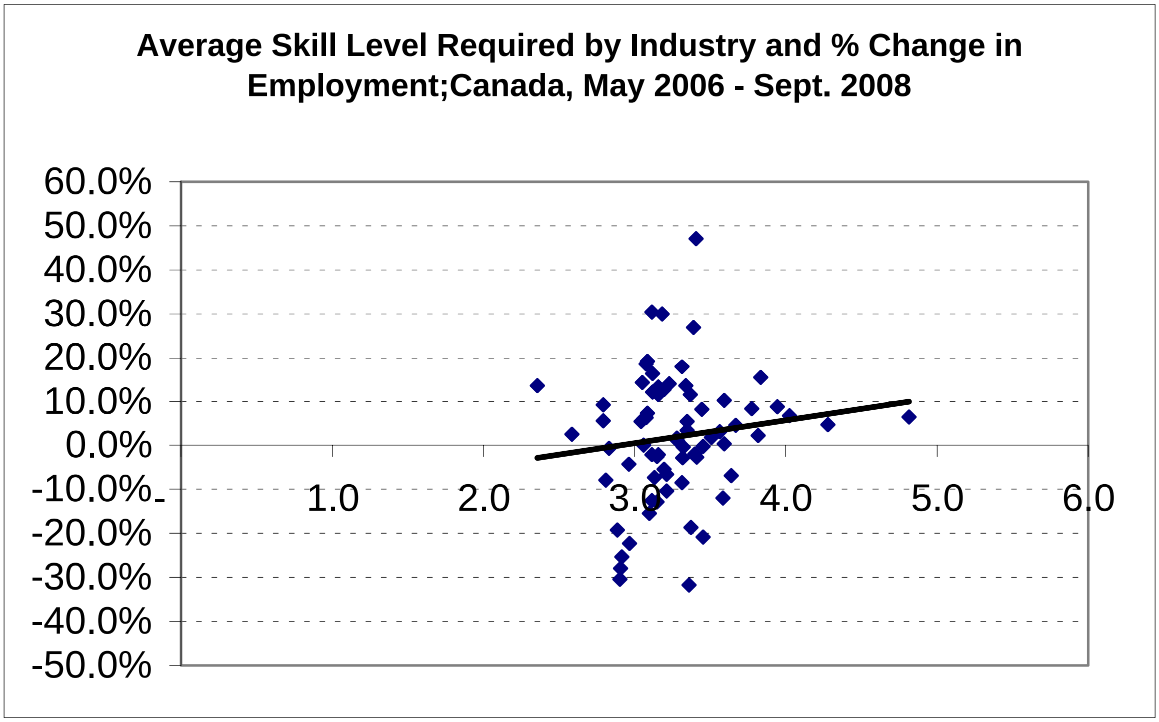
10 lowest ranked occupations for Canada absolute growth in employment

Rank	Occupation	Change in employment	Average literacy skill demand
47	Machine Operators in Manufacturing	-65,900	3.0
46	Clerical Occupations	-65,000	3.2
45	Assemblers in Manufacturing	-42,700	3.1
44	Labourers in Processing, Manufacturing and Utilities	-39,700	2.0
43	Occupations Unique to Agriculture Excluding Labourers	-30,800	2.4
42	Managers in Retail Trade, Food and Accommodation Services	-28,800	2.7
41	Primary Production Labourers	-28,000	2.0
40	Cashiers	-21,400	2.0
39	Retail Salespersons and Sales Clerks	-17,400	4.0
38	Supervisors in Manufacturing	-10,100	2.8
	Total projected growth in employment	-349,800	2.8
	Total as a percent of 2006 employment	-95.8%	

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 2.8 The 0.6 gap between these two figures suggests that the skill intensity of employment in Canada has risen rapidly between 2006 and 2008.

Figure 2.14

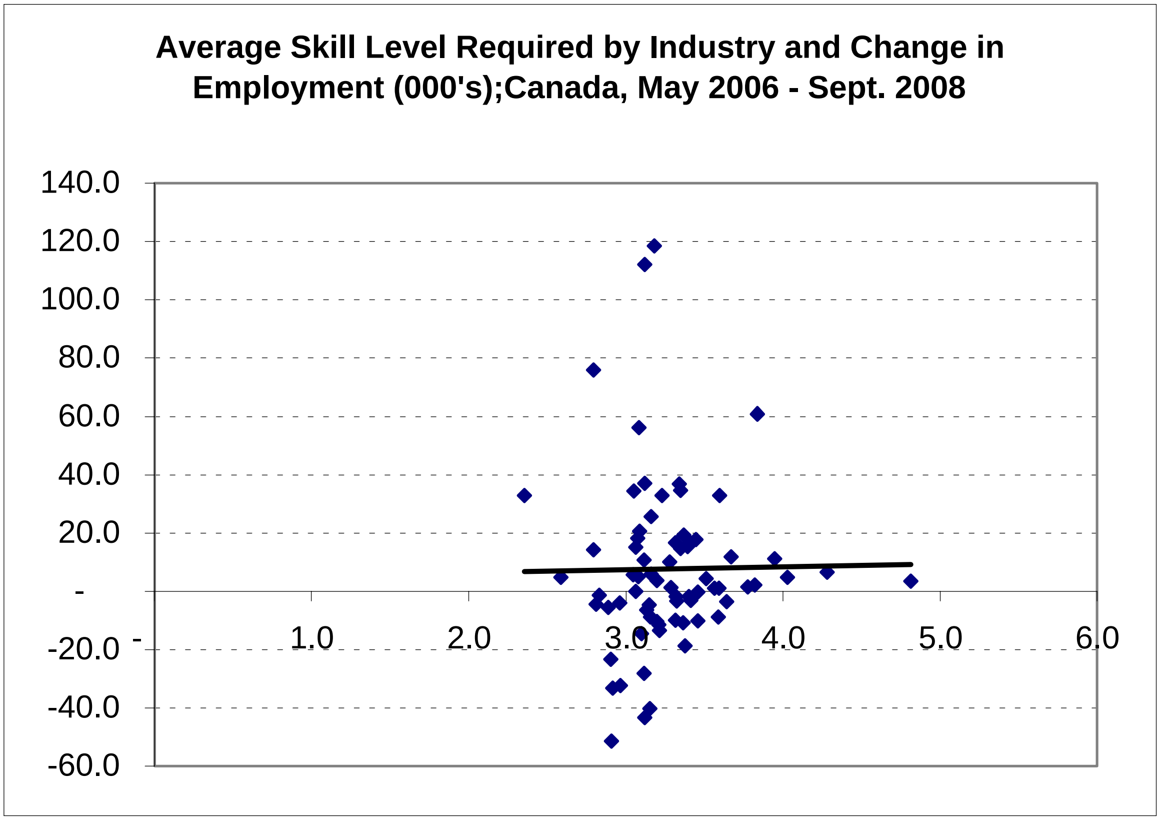
Actual aggregate job gains and losses as a proportion of 2006 employment levels by average literacy skill demand, selected industries, May 2006 to September 2008, Canada



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

Figure 2.15

Actual aggregate job gains and losses by average literacy skill demand, selected industries, May 2006 to September 2008, Canada



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

The figures reveal that changes in the national distribution of employment by industry observed between May, 2006 and September, 2008 reveal a different pattern than those observed by occupation. Specifically, changes in Canada's industrial distribution of employment observed between May, 2006 and September, 2008 appear to be only slightly positively skill-biased. Expressed in absolute terms job gains have been concentrated in jobs that demand slightly higher average prose literacy skills and have job losses have been concentrated in jobs that require slightly lower average literacy skill. 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 higher skilled jobs. The differences in the slope of the regression line between industrial and occupational employment changes suggest significant changes in the industrial and occupational mix are taking place.

The following table identifies the ten industries that experienced the most rapid, and least rapid, rates of growth in the period May, 2006 to September, 2008 in Canada.

Rank	Industry	Percent change in employment	Average literacy skill demand
1	Warehousing and Storage	47%	3.4
2	Beverage and Tobacco Product Manufacturing	30%	3.1
3	Prime Contracting	30%	3.2
4	Private Households	27%	3.4
5	Support Activities for Agriculture	21%	-
6	Performing Arts, Spectator Sports and Related Industries	19%	3.1
7	Chemical Manufacturing	19%	3.1
8	Printing and Related Support Activities	18%	3.3
9	Trade Contracting	16%	3.1
10	Ambulatory Health Care Services	16%	3.8
75	Mix farming	-41%	-
74	Fishing, Hunting and Trapping	-32%	3.4
73	Clothing Manufacturing and Leather and Allied Product Manufacturing	-30%	2.9
72	Wood Product Manufacturing	-28%	2.9
71	Plastics and Rubber Products Manufacturing	-25%	2.9
70	Business Services	-22%	3.0
69	Electrical Equipment, Appliance and Component Manufacturing	-21%	3.5
68	Textile Mills & Textile Product Mills	-19%	2.9
67	Publishing Industries	-19%	3.4
66	Primary Metal Manufacturing	-16%	3.1

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

10 highest ranked industries for Canada growth in employment

Rank	Industry	Change in employment	Average literacy skill demand
1	Prime Contracting	118,400	3.2
2	Trade Contracting	112,000	3.1
3	Food Services and Drinking Places	75,800	2.8
4	Ambulatory Health Care Services	60,900	3.8
5	Transportation	56,200	3.1
6	Nursing and Residential Care Facilities	37,100	3.1
7	Architectural, Engineering and Design Services	36,900	3.3
8	Hospitals	34,800	3.3
9	Mining and Oil and Gas Extraction	34,400	3.0
10	Insurance Carriers and Related Activities and Funds and Other Financial Vehicles	33,000	3.2
	Total projected growth in employment	599,501	3.2
	Total as a percent of 2006 employment	3.6%	

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

10 lowest ranked occupations for Canada absolute growth in employment

Rank	Industry	Change in employment	Average literacy skill demand
75	Wood Product Manufacturing	-51,400	2.9
74	Retail Trade	-43,200	3.1
73	Transportation Equipment Manufacturing	-40,200	3.2
72	Plastics and Rubber Products Manufacturing	-33,200	2.9
71	Business Services	-32,300	3.0
70	Real Estate	-28,200	3.1
69	Clothing Manufacturing and Leather and Allied Product Manufacturing	-23,400	2.9
68	Publishing Industries	-18,700	3.4
67	Primary Metal Manufacturing	-14,400	3.1
66	Broadcasting and Telecommunications	-13,400	3.2
	Total projected growth in employment	-298,400	3.0
	Total as a percent of 2006 employment	-1.8%	

The 10 fastest growing industries had an average literacy skill intensity of 3.2 whereas the 10 slowest growing industries also had an average literacy skill intensity of 3.0. Finding a smaller difference than observed by occupation suggests that most of the skill intensification is associated with shifts in the occupational distribution of employment.

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 and that 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.

As measured by the demand for literacy skill per worker. The Canada economy is among the most literacy skill intense, Newfoundland the least.

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. British Columbia and Ontario have the highest proportions of Level 4 and 5 jobs among the jurisdictions and among the lowest proportions of Level 1 and 2 jobs of the jurisdictions.

In addition the chapter reveals that:

the demand for literacy skill varies significantly by occupation and industry

- projected changes in the distribution of employment by occupation are likely to increase demand for skill rapidly. 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.

- furthermore recent shifts in employment, observed between May 2006 and September 2008 in the Labour Force Survey, mirror the trend observed in the COPS projections for Canada. 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 in some jurisdictions than others. New Brunswick appears to be the only anomaly 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, 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.

Having established a first order approximation of the likely level of literacy skill demand that existed in 2006 and the fact that the demand for literacy skill is likely to increase rapidly over the coming decade the analysis turns to exploring the supply of literacy skill that is available to Canadian employers and how the supply is expected to evolve over the coming decade.

Chapter 3: The supply of literacy skill

This chapter provides a detailed profile of the supply of literacy skill in Canada and the jurisdictions by industry and occupation. 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.

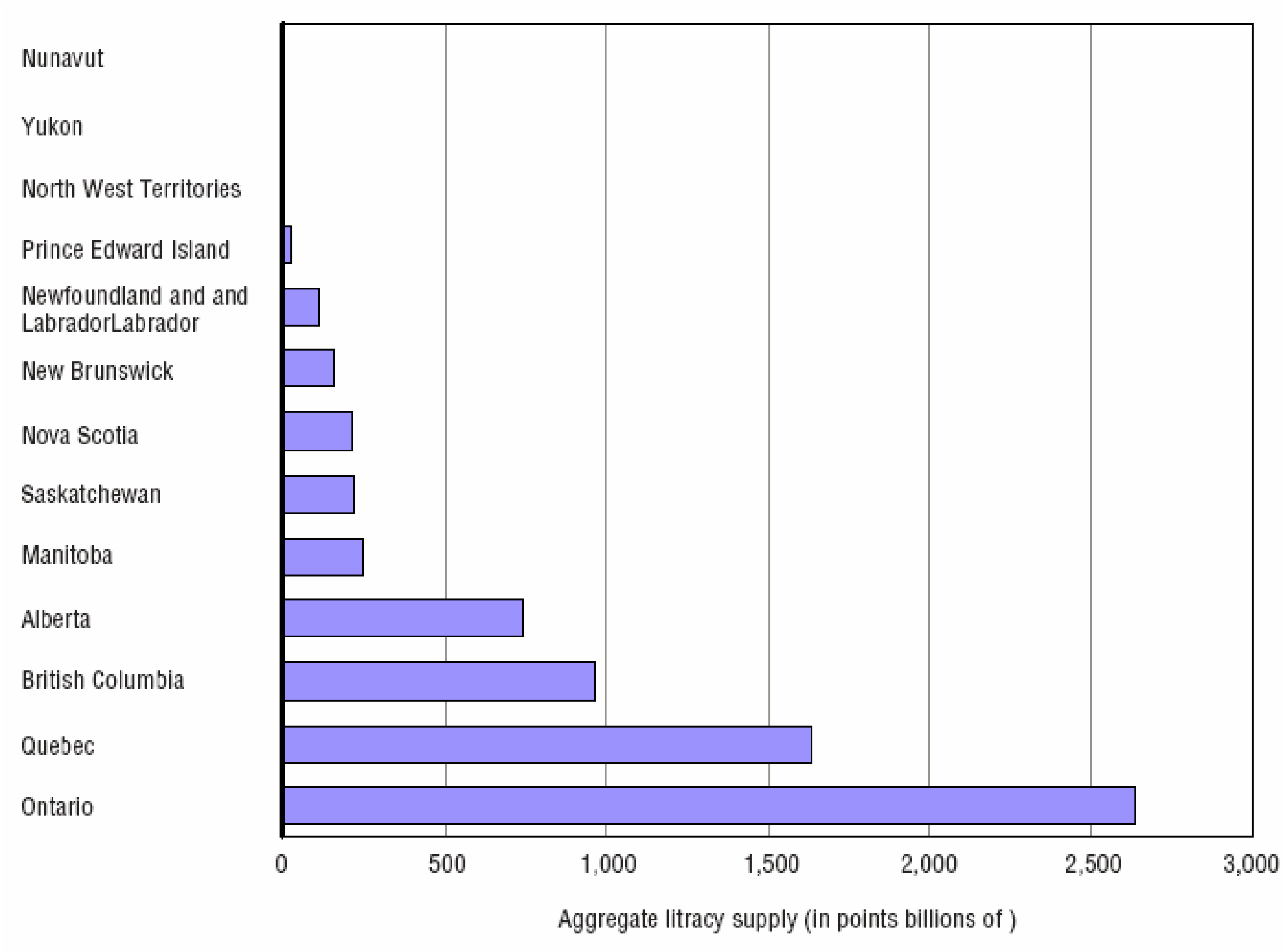
It is important to keep in mind that the current stock, or supply, of skill available to the economy is the product of a complex set of social, economic and educational processes operating over the life course. Canada has one of the highest levels of average adult literacy skill among the world's most 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 supply profiles use data collected by the 2003 International Adult Literacy and Skills Survey (IALSS) and the 2006 Census 2B individual file. More specifically, 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 methods employed to derive literacy supply estimates are described in Annex C.

Figure 3.1

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



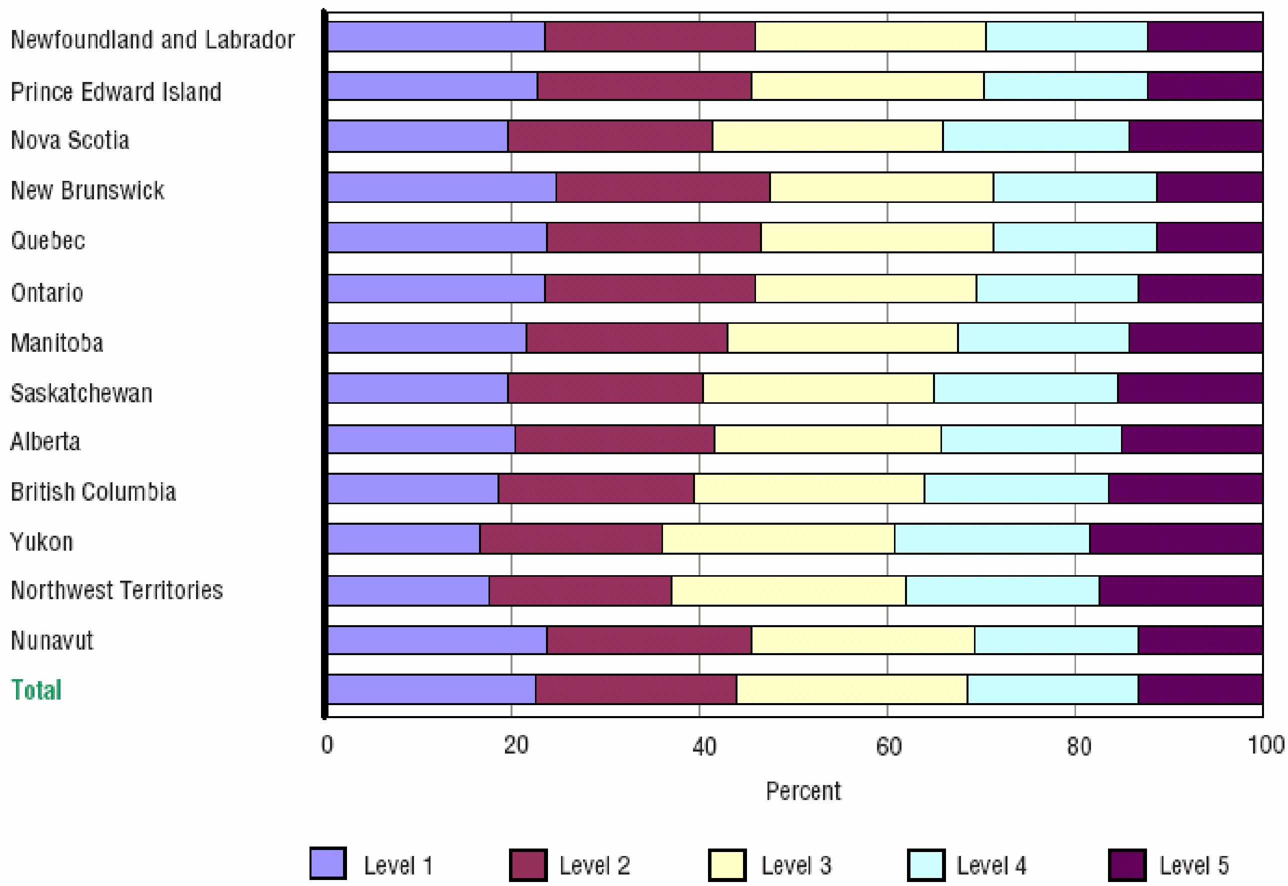
Source: 2006 Census of population.

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. 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 3.2 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



Source: 2006 Census of population.

The figure reveals several interesting facts, including that:

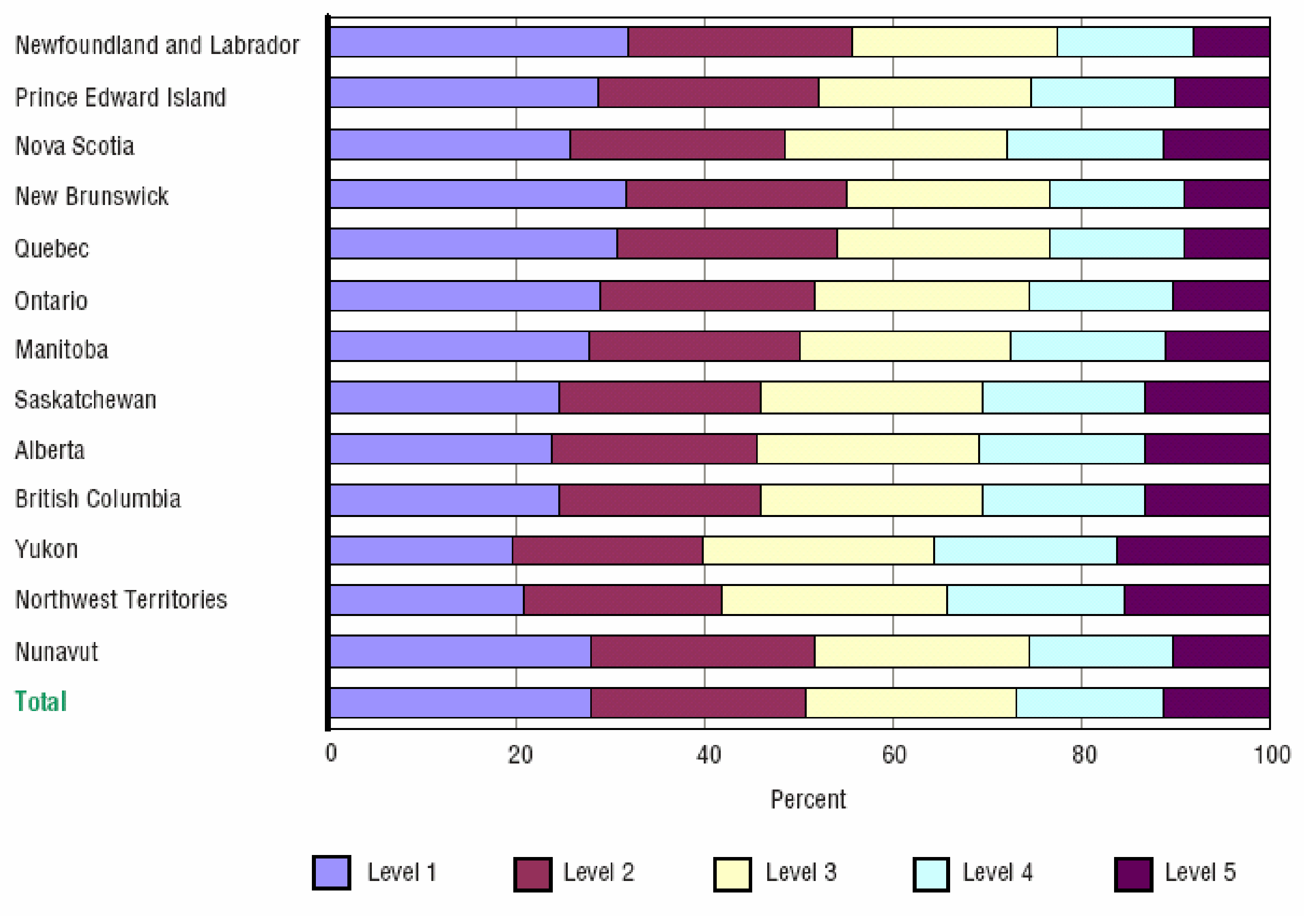
- The proportion of employed adults that possess Level 1 and 2 literacy skills ranges between 28% and 43% depending on the jurisdiction.
- The proportion of adults with Levels 4 and 5 prose literacy skills does not exceed 39% in any

Jurisdiction

One of the ways in which employers may respond to any literacy skill shortage is to hire workers with the requisite skills from the occupationally experienced labour force i.e. workers that are not currently employed but who have worked in the past five years in the target occupation. 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 occupationally experienced labour force, the provinces and territories, 2006



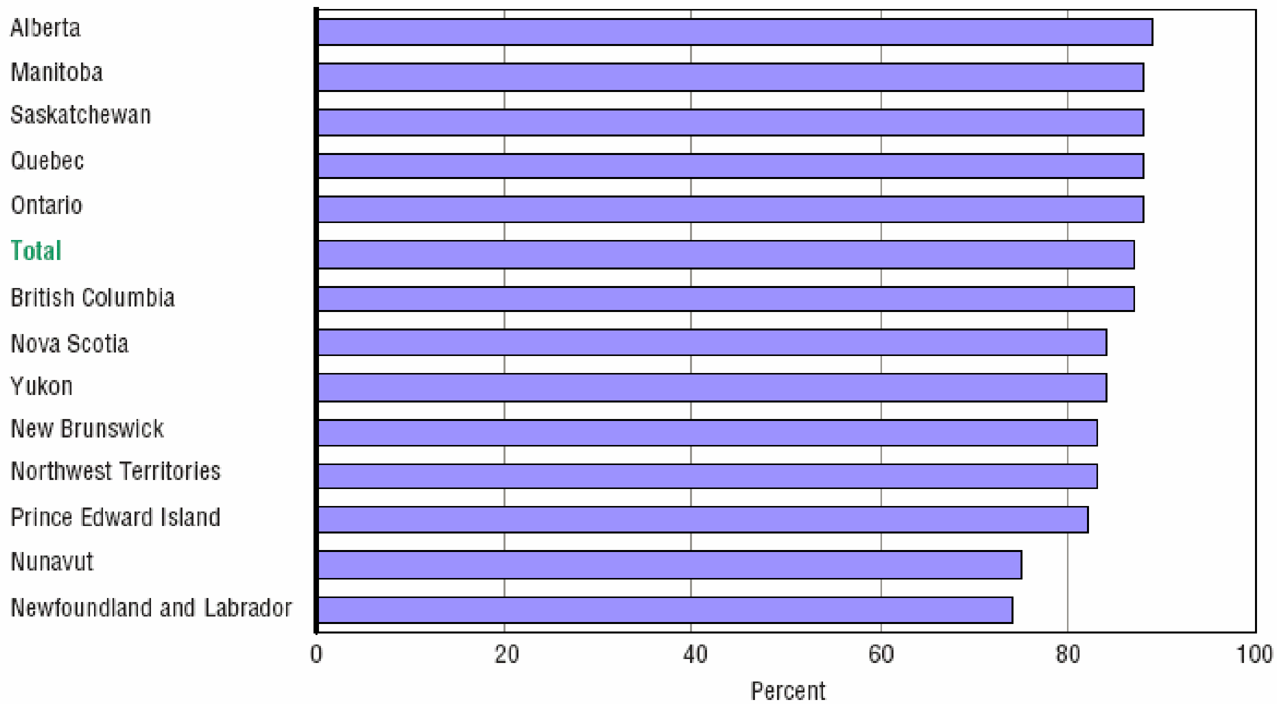
Source: 2006 Census of population.

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.

One measure of economic efficiency is the rate at which the economy utilizes the supply of occupationally-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



Source: 2006 Census of population.

The figure reveals that utilization rates of the occupationally experienced population vary significantly by jurisdiction. An 87% national utilization ratio suggests that employers could draw occupationally experienced workers into the labour market as a means to meet rising demand for literacy skill.

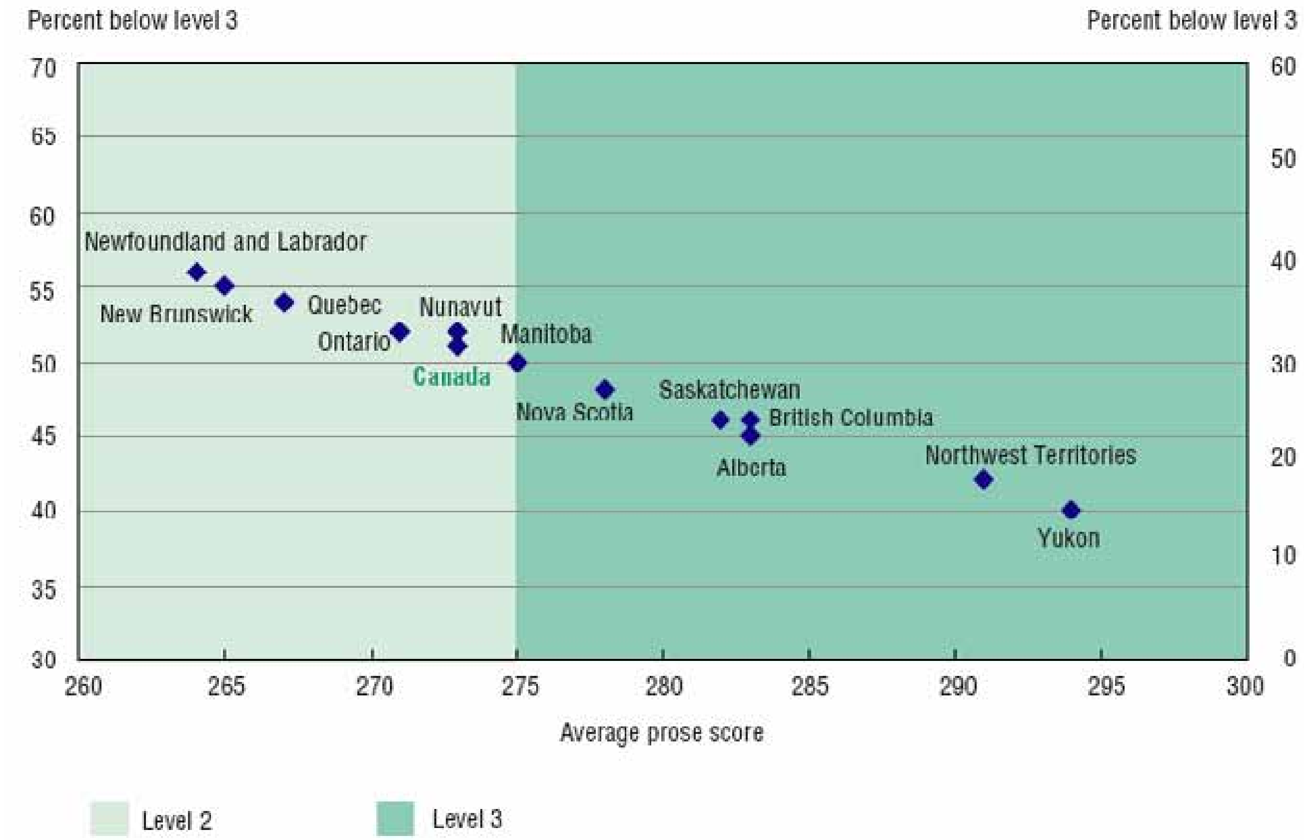
The data reveal a relationship between utilization rates and literacy skill level. Specifically, national utilization rates rise with skill level from a low of 85% for Level 1 to 90% for workers with Level 5 skills. Thus, occupationally experienced workers with lower skills have a much higher probability of being unemployed but even Level 1 workers with occupational experience have a very high probability of being employed. The relative probabilities of employment by literacy by level vary considerably by jurisdiction however, variation that appears to reflect differences among jurisdictions in the prevailing aggregate level of skill demand.

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; Statistics Canada and OECD, 2005). 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



Source: 2006 Census of population.

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 the NWT (291), Alberta and British Columbia (283) and Saskatchewan (282). 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 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.

The fact that only two jurisdictions, the Northwest Territories and the Yukon, have average literacy skill levels above the implied average complex demand level of 287 raises the possibility of aggregate literacy skill shortages.

Figures 3.6 and 3.7 extend 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)

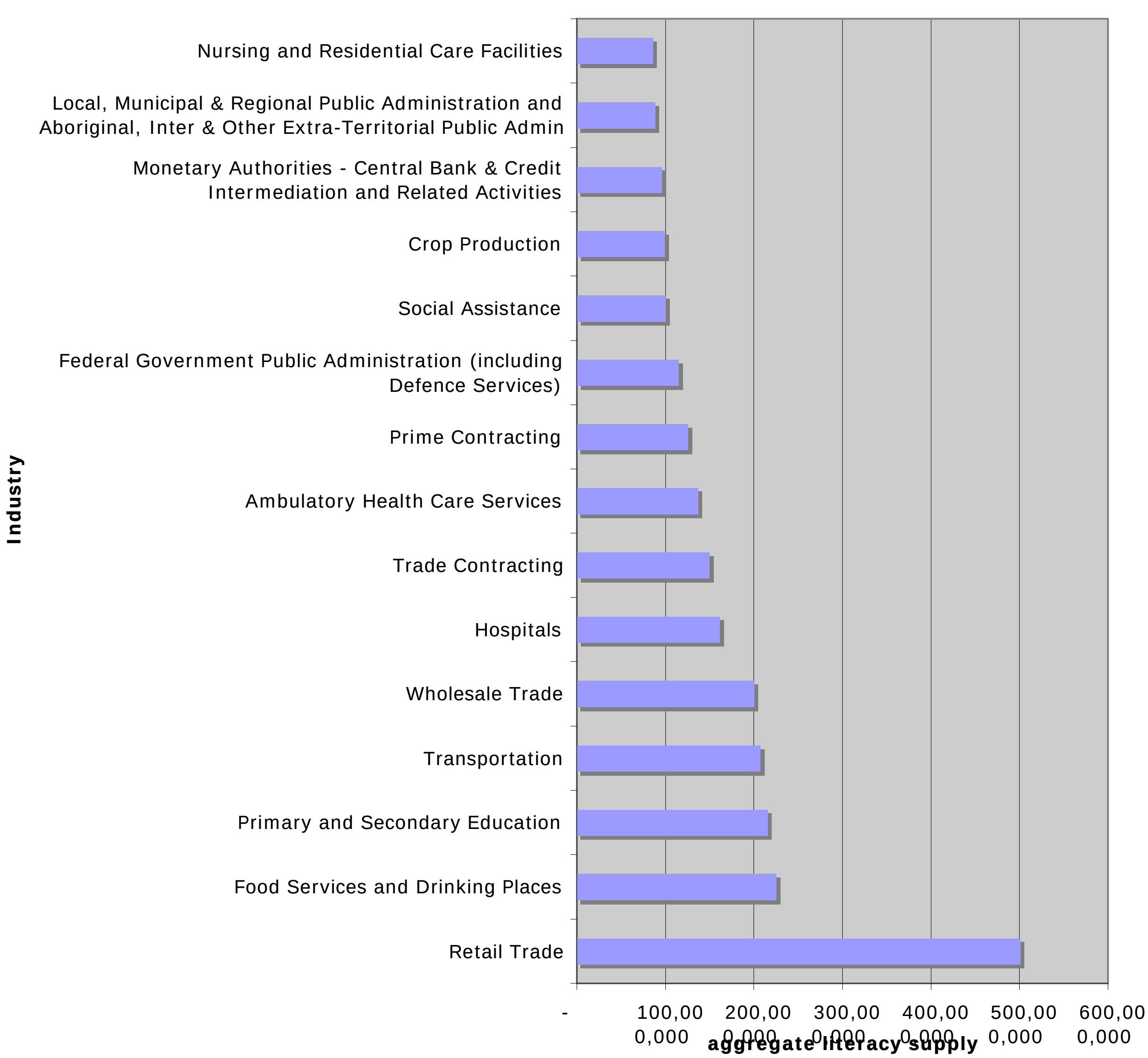
The North American Industry Classification System (NAICS) is an industry classification system developed by the statistical agencies of Canada, Mexico and the United States. Created against the background of the North American Free Trade Agreement, it is designed to provide common definitions of the 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 Aggregate literacy skill supply, selected industries, Canada, 2006



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

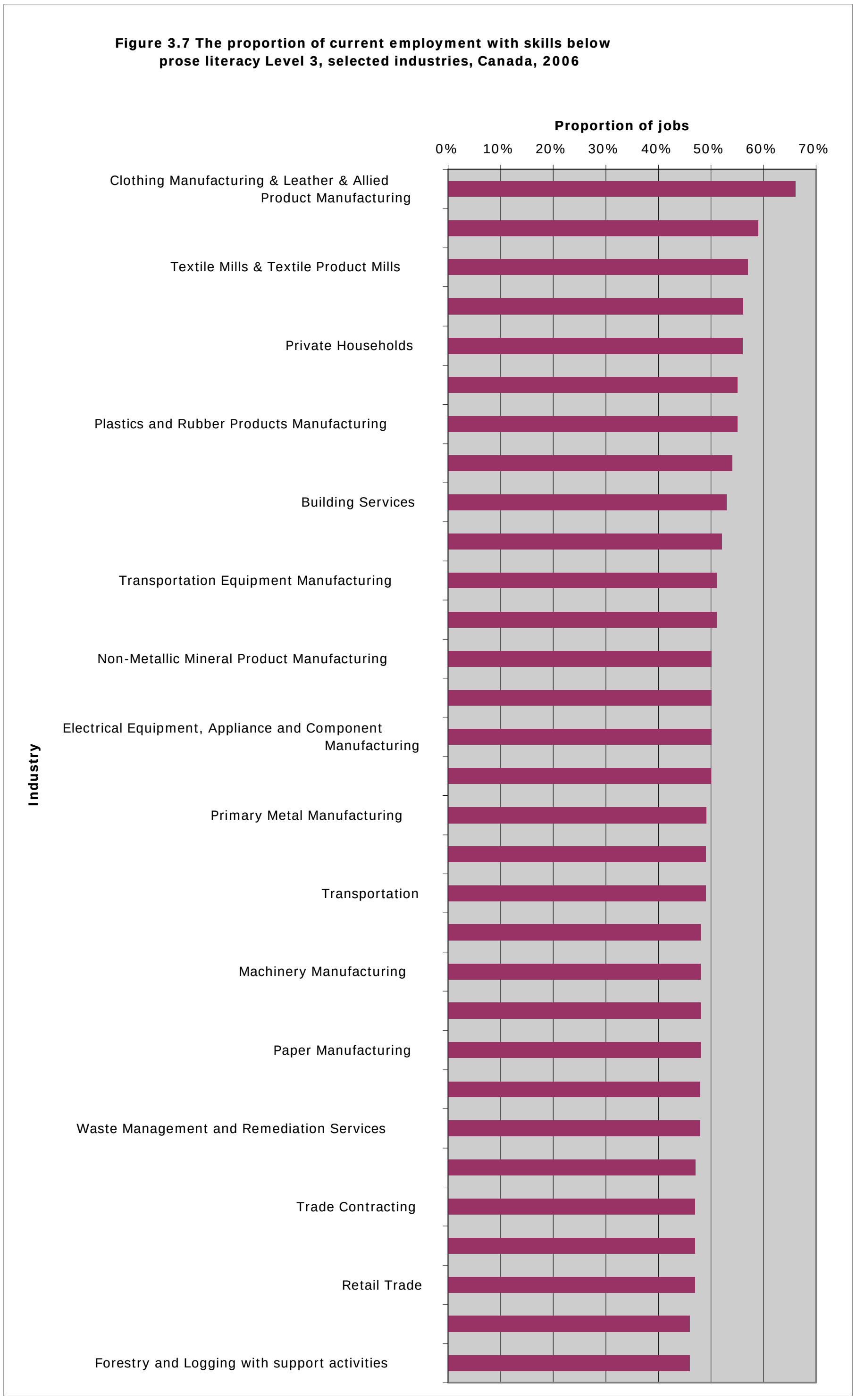
15 industries that can draw on the largest supply of literacy in Canada include:

Industry	Employment	Aggregate literacy supply
Retail Trade	1,795,850	501,042,150
Food Services and Drinking Places	824,650	225,129,450
Primary and Secondary Education	704,650	215,622,900
Transportation	753,750	207,281,250
Wholesale Trade	709,550	200,093,100
Hospitals	553,250	161,549,000
Trade Contracting	538,250	149,633,500
Ambulatory Health Care Services	467,000	136,831,000
Prime Contracting	450,950	125,815,050
Federal Government Public Administration (including Defence Services)	383,850	115,155,000
Social Assistance	339,950	99,945,300
Crop Production	376,250	98,953,750
Monetary Authorities - Central Bank & Credit Intermediation and Related Activities	328,600	96,279,800
Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin	303,650	88,665,800
Nursing and Residential Care Facilities	304,600	85,897,200

Figure 3.7 presents those industries that have 50% or more 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, Canada, 2006 Error! Bookmark not defined.



The associated table reveals that sixteen industries operate with 50% or more of workers with skills below Level 3:

Clothing Manufacturing & Leather & Allied Product Manufacturing	66%
Fishing, Hunting and Trapping	59%
Textile Mills & Textile Product Mills	57%
Private Households	56%
Furniture and Related Product Manufacturing	56%
Plastics and Rubber Products Manufacturing	55%
Food Manufacturing	55%
Crop Production	54%
Building Services	53%
Wood Product Manufacturing	52%
Transportation Equipment Manufacturing	51%
Fabricated Metal Product Manufacturing	51%
Electrical Equipment, Appliance and Component Manufacturing	50%
Miscellaneous Manufacturing	50%
Printing and Related Support Activities	50%
Non-Metallic Mineral 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 supply of literacy skill being employed.
- Industries differ greatly in the proportions of low and high skilled workers they employ, and,
- These differences will almost certainly influence the level of labour productivity achieved and the rate at which firms can adopt more productive work organizations and technologies of production.

The analysis now shifts to a parallel exploration of the distribution of the supply 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. *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.
C. Occupations usually require secondary school and / or occupation-specific training.	4 or 5	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.
D. On-the-job training is usually provided for occupations.	6	Short work demonstration or on-the-job training. *or* No formal educational requirements.

Source: HRSDC

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

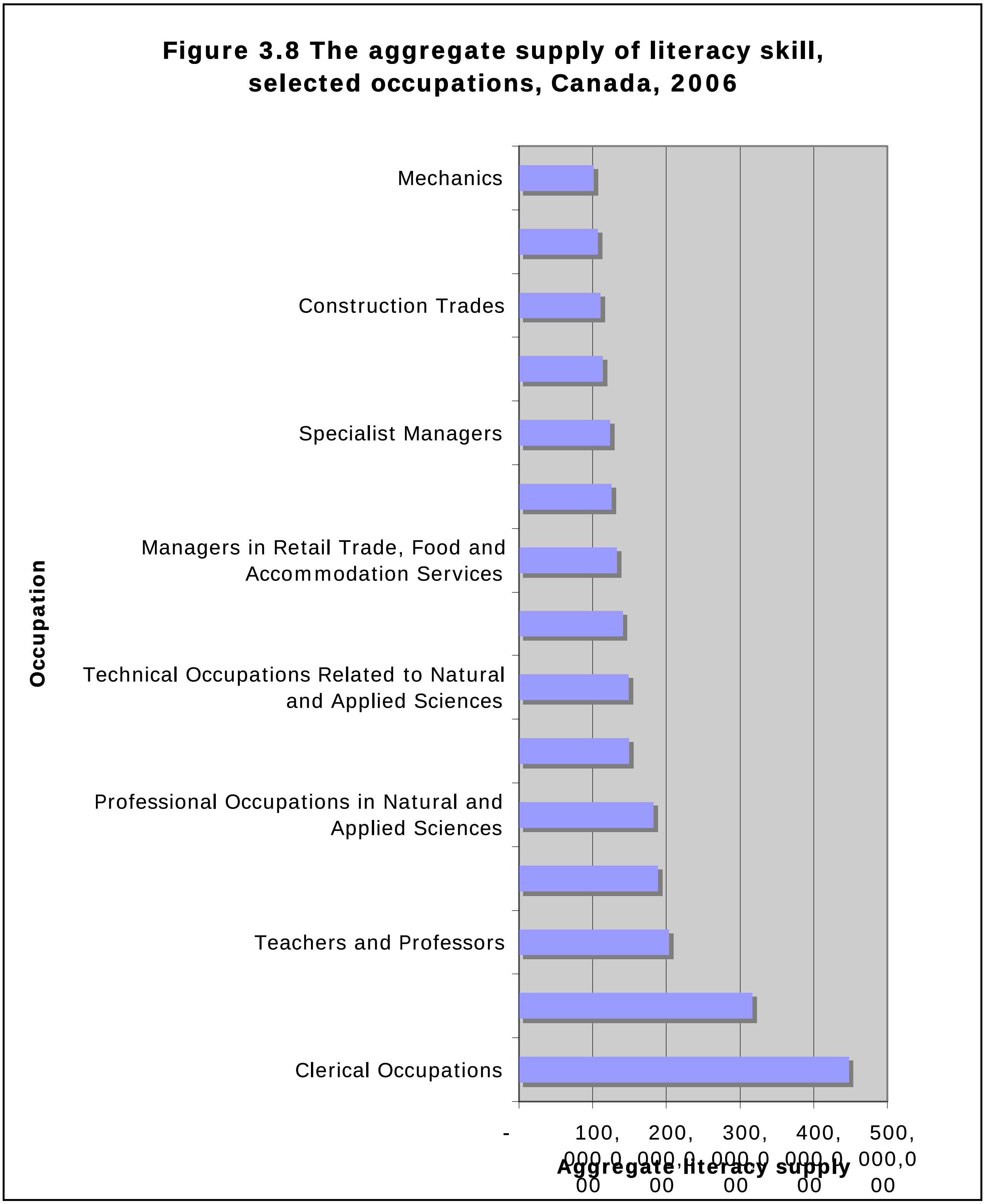
At the three-digit level, the major groups are further divided into 140 *minor groups*.

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.

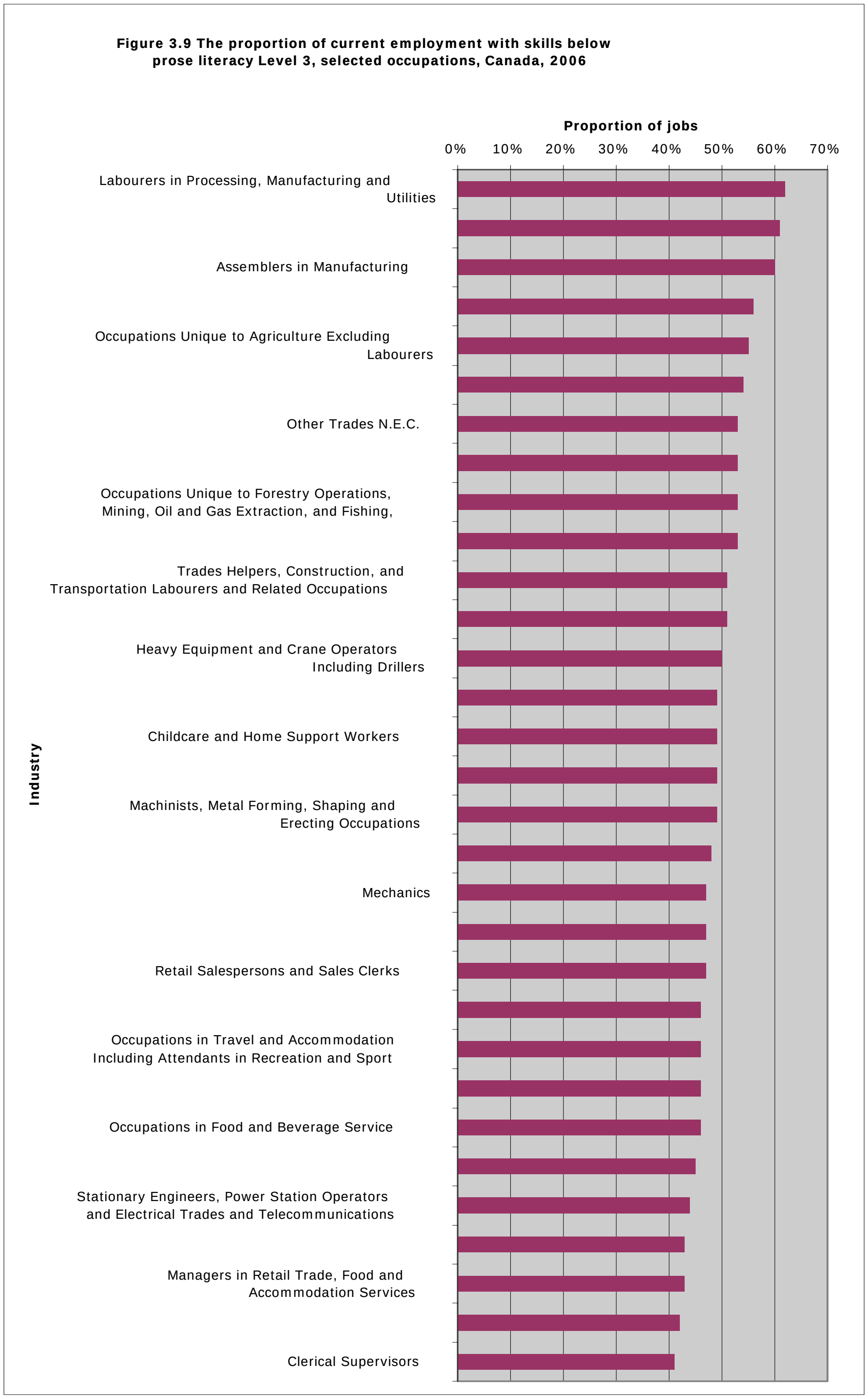
Figures 3.8 through 3.9 provide estimates of the total stock of skill that is available to each occupation computed by multiplying the total number of adults that were employed as of the Census reference period in May 2006 by prose literacy score. This is referred to as the current stock of prose literacy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

Figure 3.8 shows that the Canada 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.



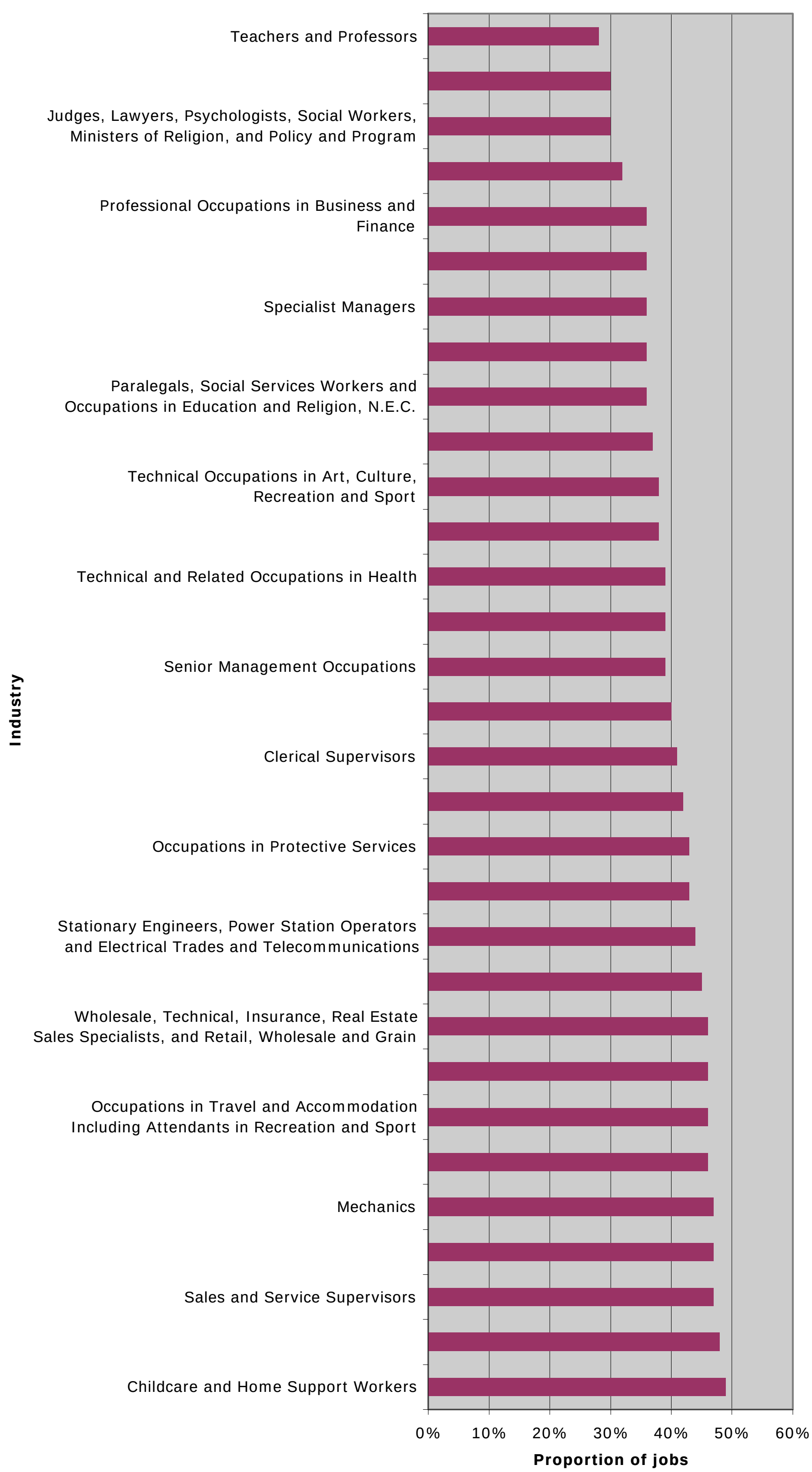
Source: IALSS, 2003 and Census of Population, 2006.



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 Canada that have above average proportions of Levels 3, 4 and 5 prose literacy skill at peak demand.

Figure 3.10 The proportion of current employment with skills above prose literacy Level 2, selected occupations, Canada, 2006



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

- Occupations vary considerably in the stock of skill being employed.

- Occupations differ markedly in the size of the "experienced" skill supply that they might draw upon; and,

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

Having established these facts the analysis turns to an exploration of how the supply of literacy skill is expected to evolve over the coming decade, the basic question of interest being whether expected increases in literacy supply are likely be able to satisfy the rising demand documented in Chapter 2.

3.1 Projections of prose literacy skill supply

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 Canada, 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.

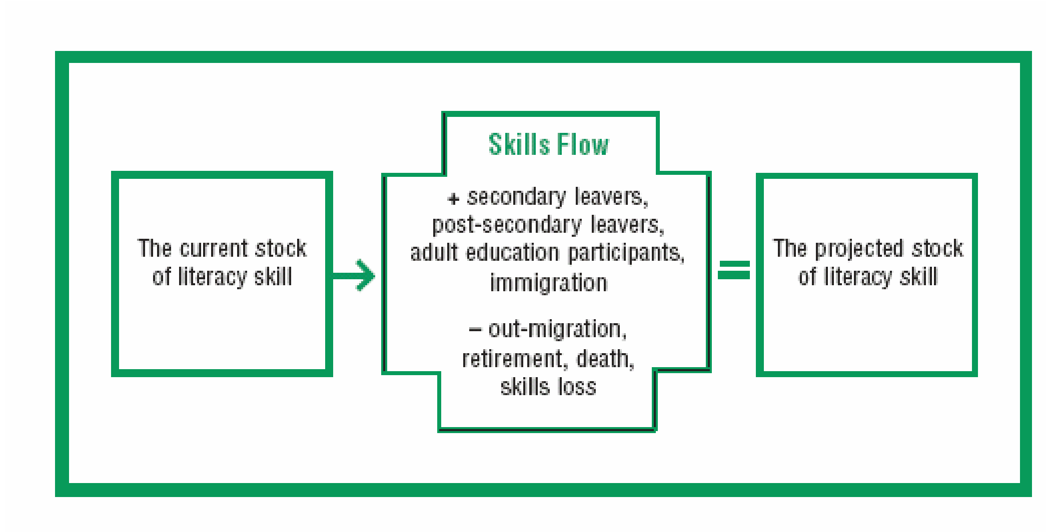
Similarly, out-migration is likely to reduce the stock of skill over time as high skilled adults seek economic opportunity in other countries and retirees seek warmer climes.

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



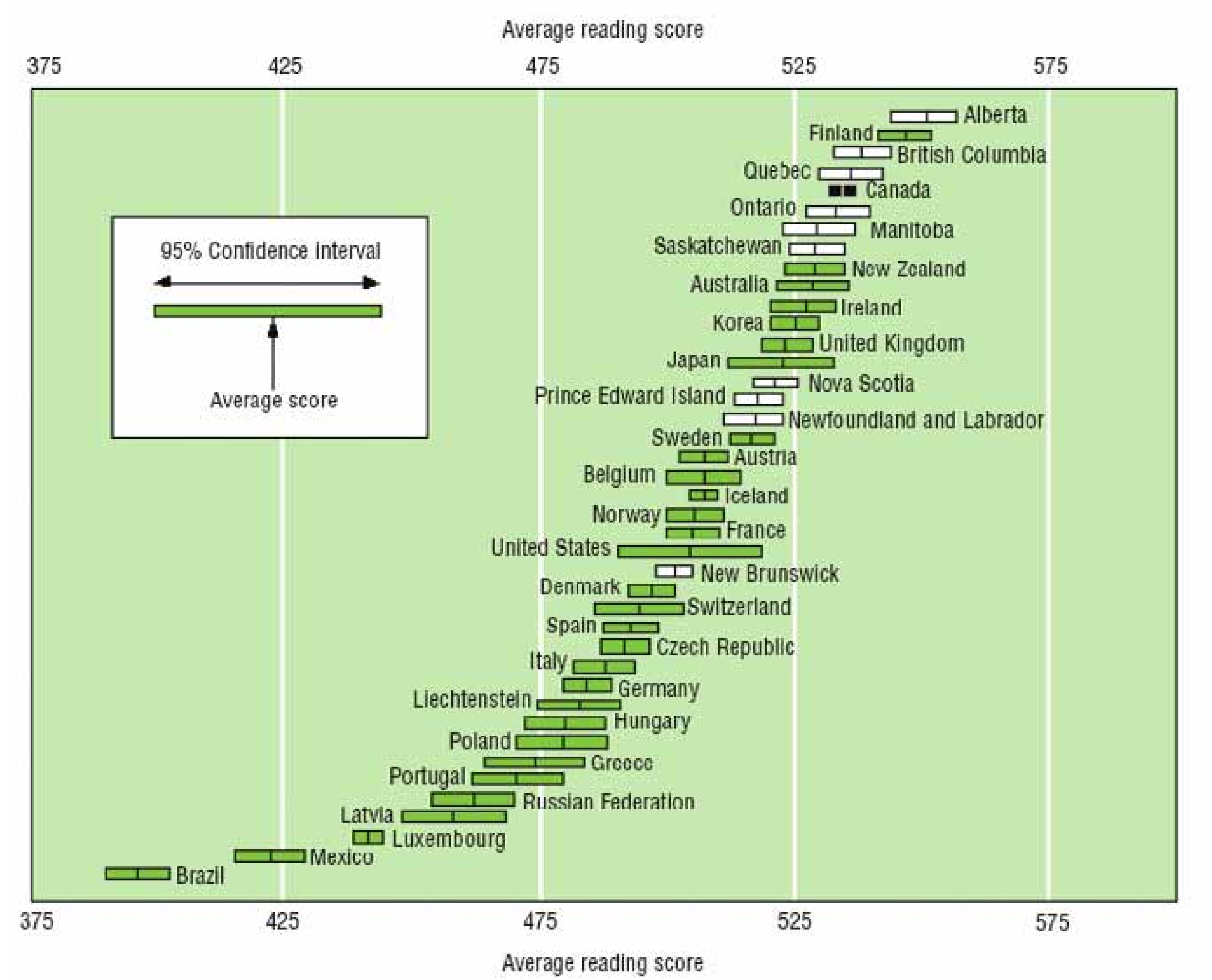
The following figures are included to provide readers with some sense of the relative quality of the skill flows that will precipitate change in the stock of Canada's stock of skill.

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. Nevertheless there is considerable variation in average skill level among jurisdictions with Canada's Atlantic provinces scoring well below their peers. It is also worth noting, 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.

Figure 3.13

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



Source: PISA 2000

Skill gain through adult education and training

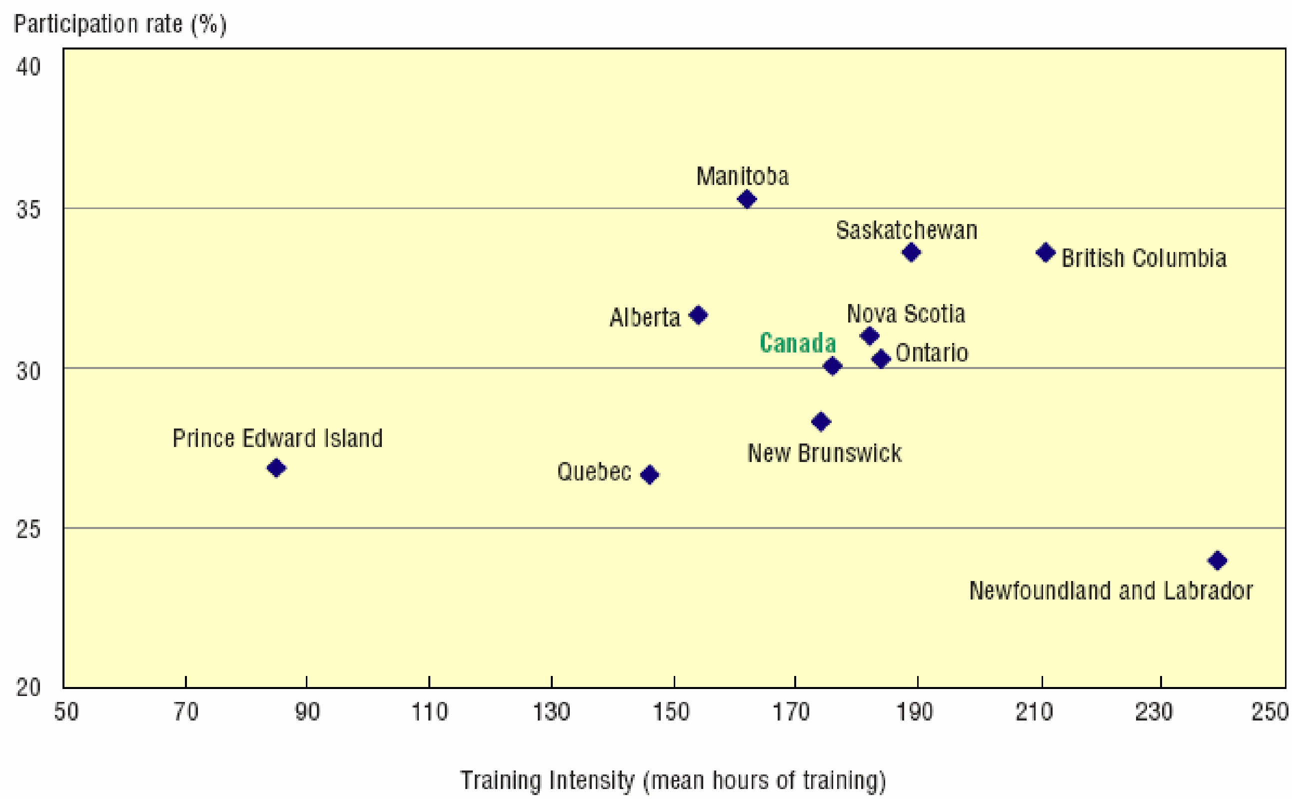
Figure 3.14 displays the annual rates of participation in adult education and training by the intensity of training, measured in average hours, for provinces.

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.

Provinces vary significantly in their approaches to adult education and training. Some jurisdictions, such Newfoundland, offer more intense training to lower proportions of workers whereas as Manitoba offers fewer hours per participant to much higher proportions of workers. These differences likely have an impact on the literacy skill gained through participation.

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



Source: Adult Education and Training Survey, 2003

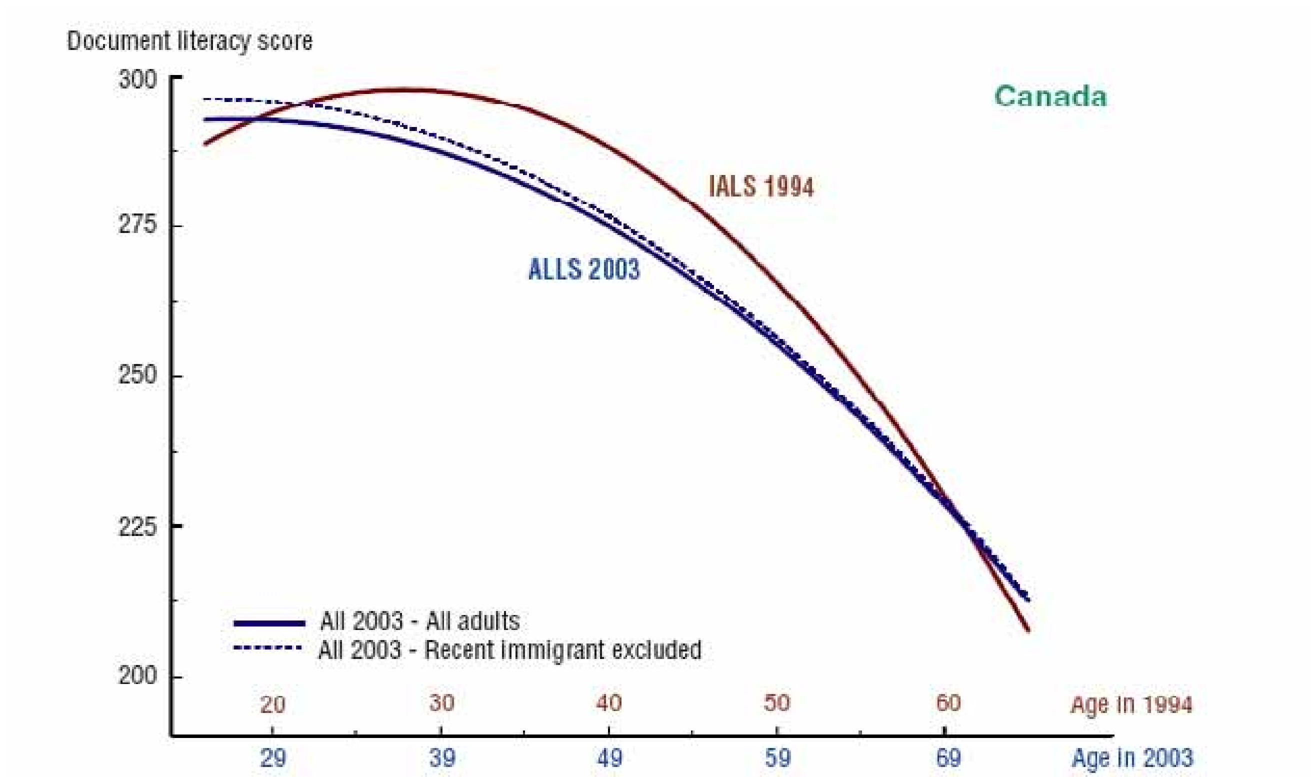
Skill loss

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 for Canada to those of Ontario and British Columbia. 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 Ontario, Canada's largest labour market, reveals a similar pattern of skill loss. In sharp contrast the chart for British Columbia reveals a dramatically different pattern - rather than skill loss over most of the age range during the decade 1994 – 2003 British Columbia residents appear to have gained a small amount of skill. The apparent skill gain is most pronounced in younger adults. These findings suggests that the demand for literacy skill is only at the level needed to maintain current stocks in British Columbia, a finding that differs from other jurisdictions where the low levels of skill use demanded by some industries appears to reduce incentives to read on the job. This fact argues for government policies to increase the level of literacy skill demand. In the absence of such policies it is likely that any new supply created through adult education and training will evaporate as quickly as it is created.

Figure 3.15

Net document literacy skill loss of adults by age, 1994 to 2003, Canada, Ontario and British Columbia



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 literacy skill that will be available to the Canadian economy we employ a set of skill projections that were derived by the authors on behalf of the Canadian Council on Learning (CCL) and published in Reading the Future: Planning for Canada's Future Literacy Needs (CCL, 2008) (see below). Readers are referred to this publication for a more detailed description of the methods that were used to derive the projections and their fitness for use in the current context.

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.

Projecting Canada's literacy profiles: the findings

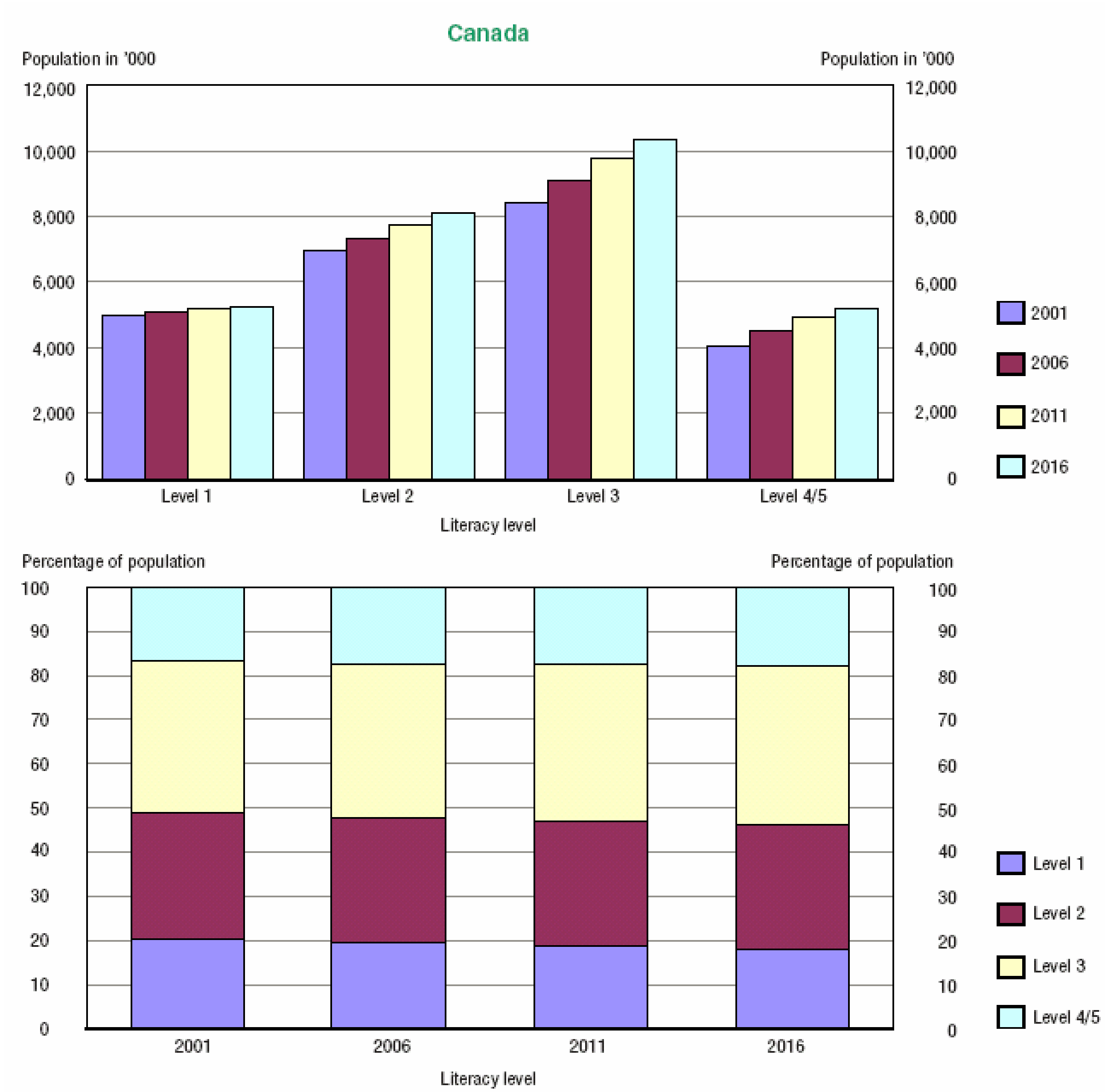
The following section presents a summary of what the projections reveal at the jurisdictional level. There is nothing remarkable about the analysis, depending as it does upon an exploration of the projected numbers of people at each of skill level and changes in the expected proportions of the population that these numbers imply. Sophisticated statistical techniques would only serve to obscure the obvious – that the peril of low literacy will continue to affect 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



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 average level of literacy skill demanded by the Canadian economy.

The figure reveals a second 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 the Canadian economy given the degree to which Canadian employers have relied on attracting workers from other jurisdictions to meet rising demand. The fact that the supply of literate workers is expected to remain stable suggests a need to look elsewhere for skill. Immigration, inter-provincial migration and adult upgrading are the three obvious options open to jurisdictions.

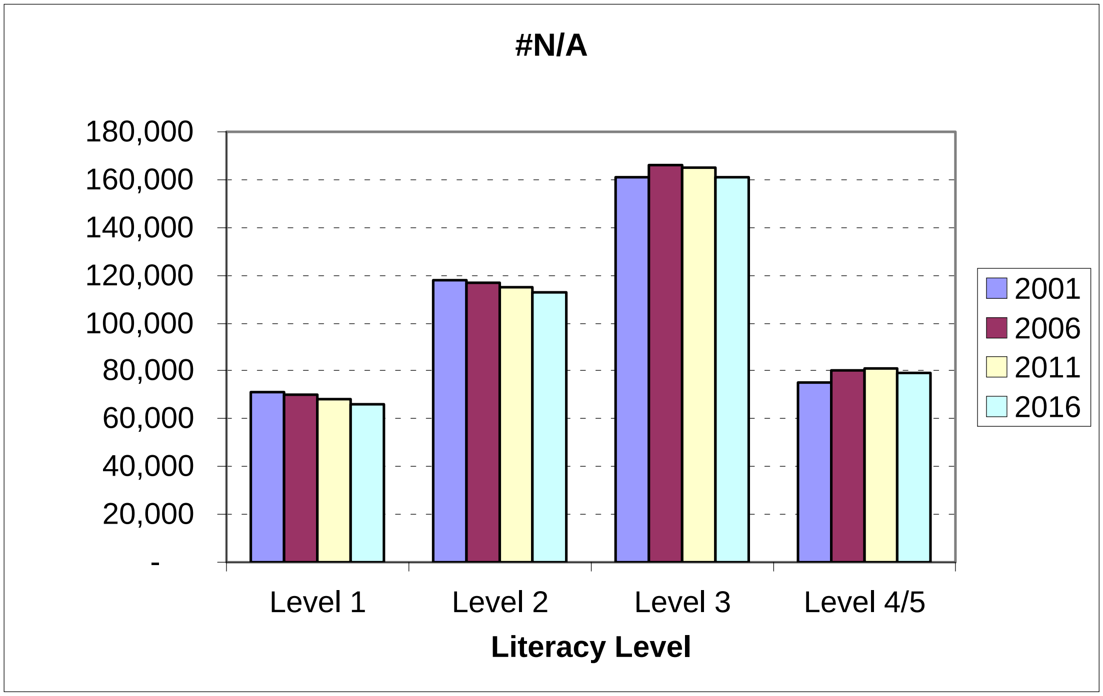
Figures 3.16 A - M explore how the distributions of adult literacy skills by proficiency level are likely to evolve over the medium term in each jurisdiction. The goal of this analysis is to determine whether current levels of investment in education and training are likely to generate the additional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

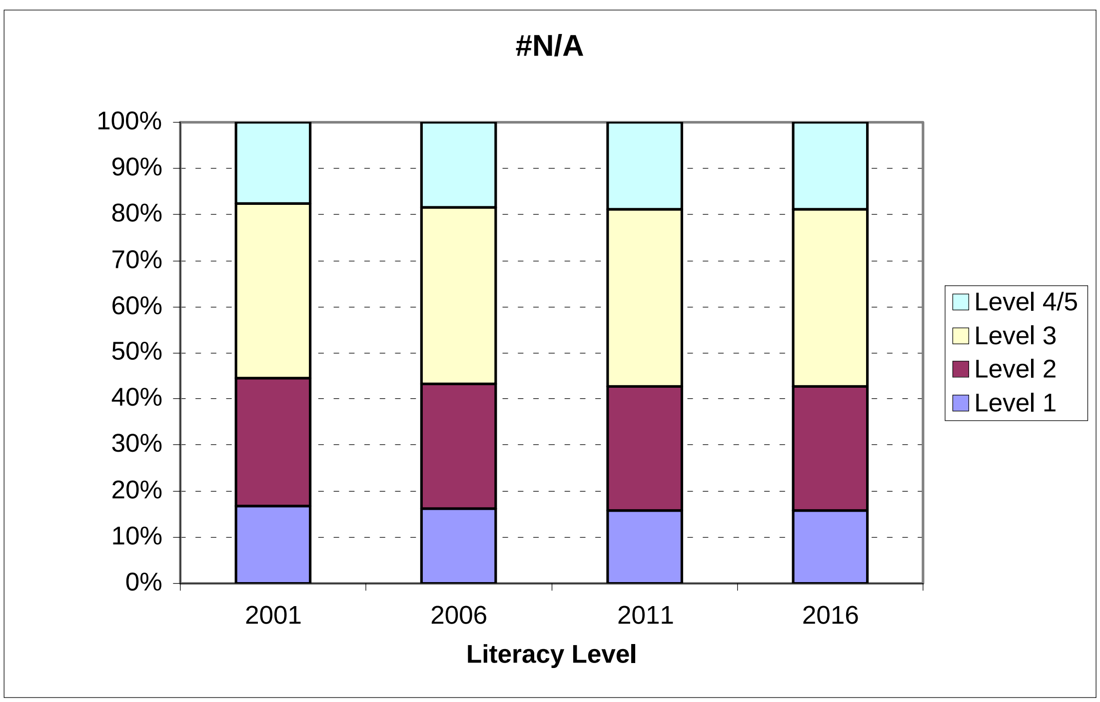
Jurisdictions differ markedly in the their projected population growth rates, in the numbers and characteristics of inter-provincial migrants and immigrants that they attract and in the literacy intensity of employment. These differences have a significant influence on the projected growth rates of low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

Figures 3.16 A –M

Projected numbers and proportions of adults aged 16 and over by prose literacy proficiency level, 5 year intervals 2001 – 2016, by jurisdiction

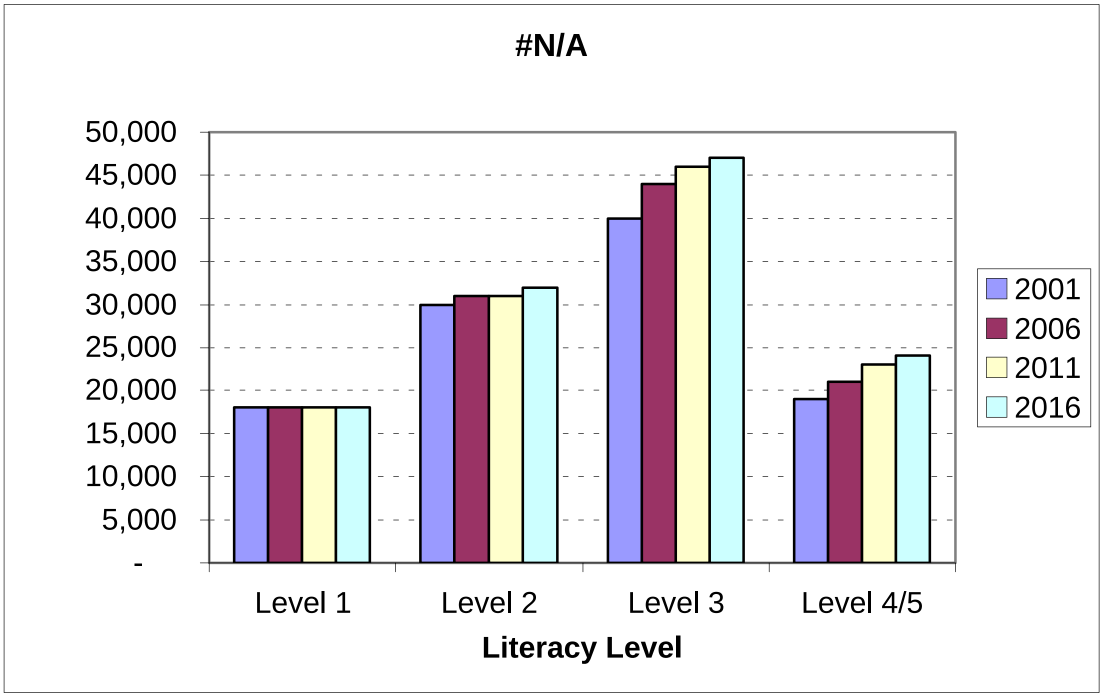
Newfoundland

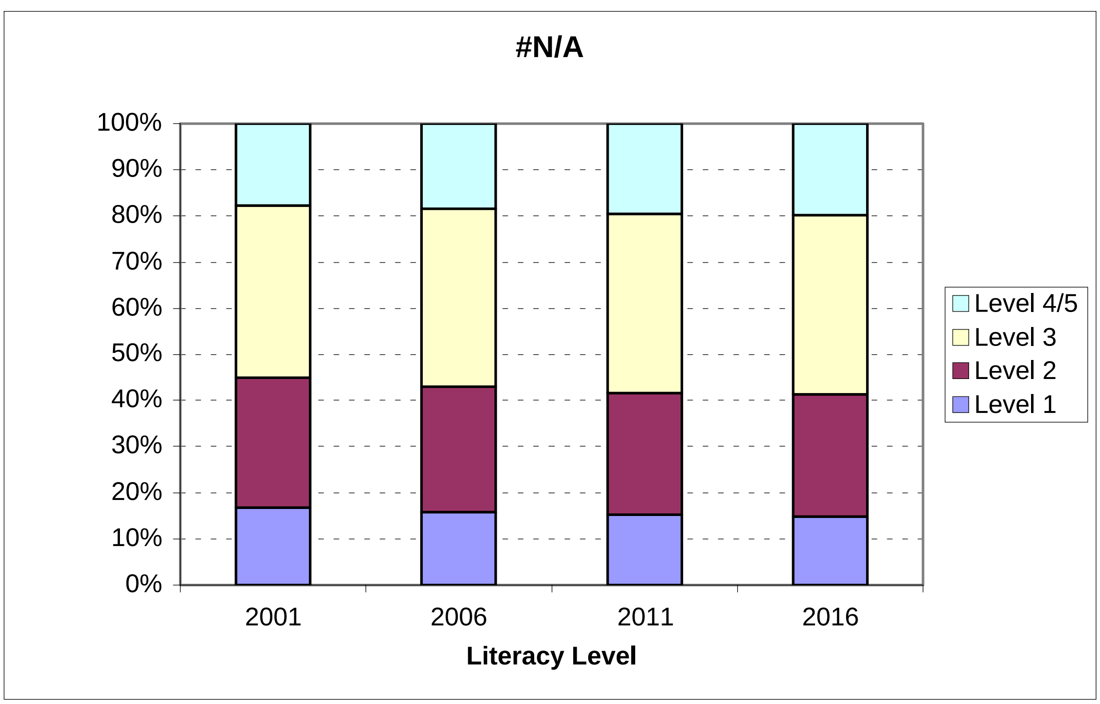




In Newfoundland the absolute numbers of adults with skills below Level 3 is projected to decline from 186, 755 to 179,175 from 2006 to 2016, or 4.1%. The Newfoundland population is forecast to drop by 3.2% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

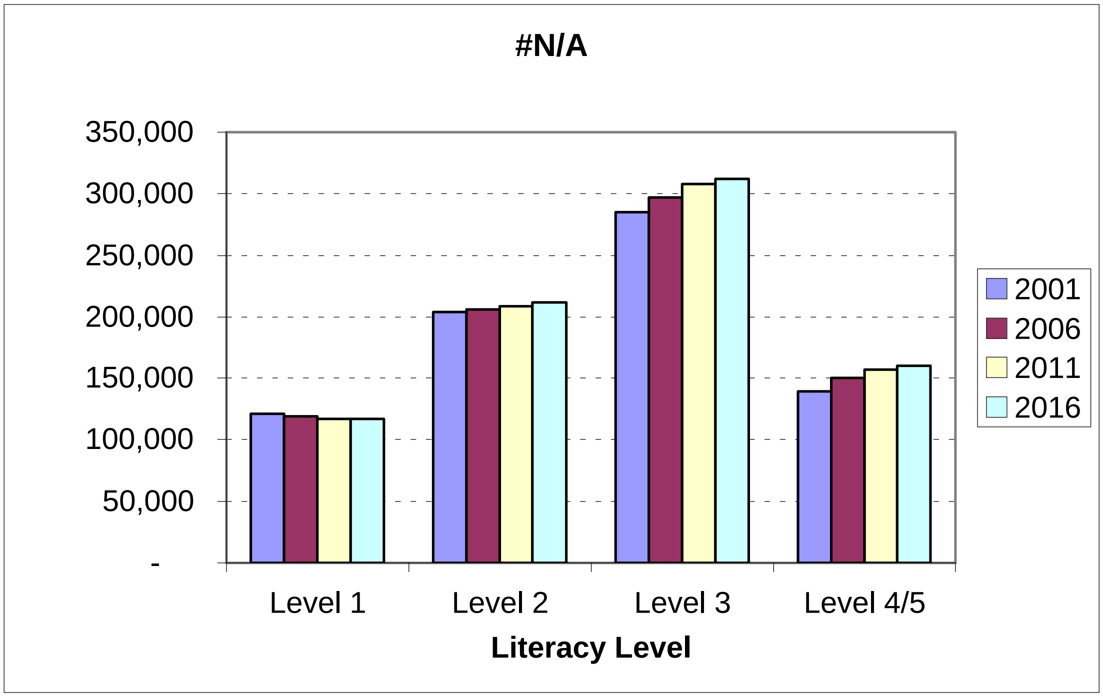
Prince Edward Island

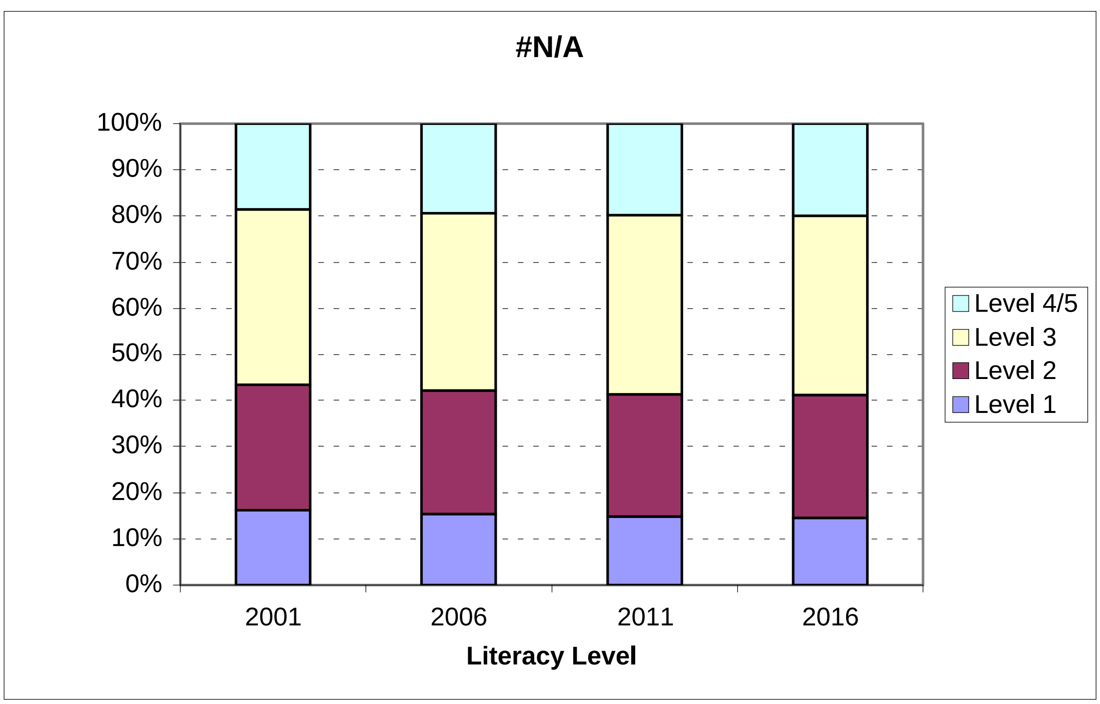




In PEI the absolute numbers of adults with skills below Level 3 is projected to increase from 48.462 to 49,780 from 2006 to 2016, or 2.7%. The Island population is forecast to grow by 6.8% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 2%.

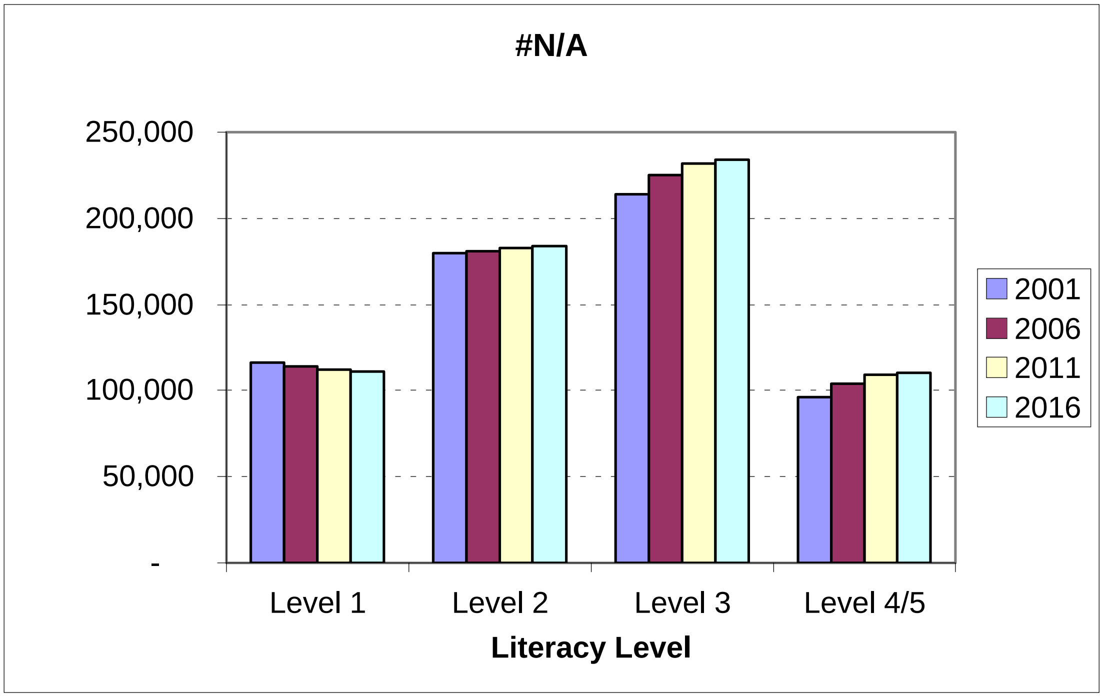
Nova Scotia

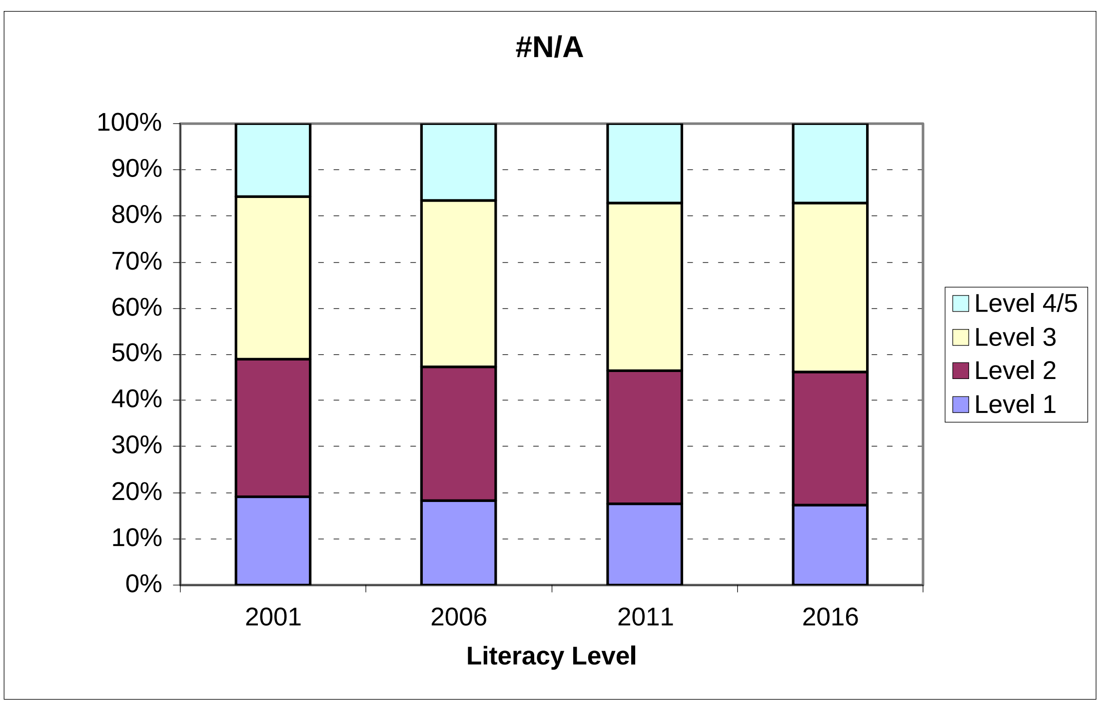




In Nova Scotia the absolute numbers of adults with skills below Level 3 is projected to increase from 48.462 to 49,780 from 2006 to 2016, or 2.7%. The Nova Scotian population is forecast to grow by 6.8.% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 2%.

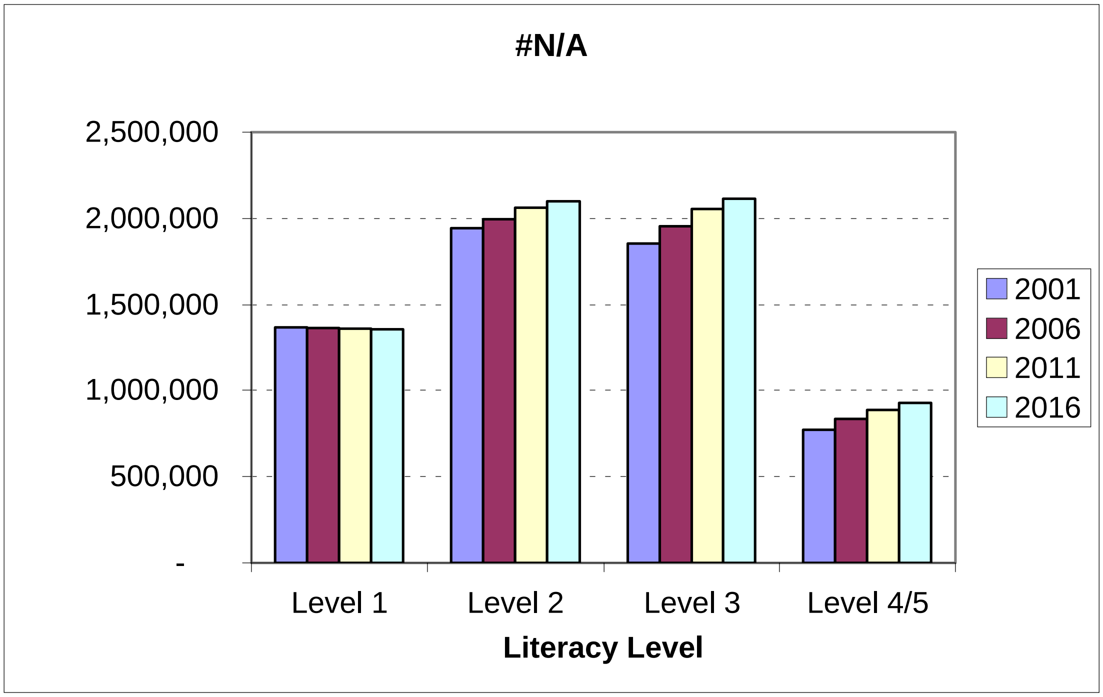
New Brunswick

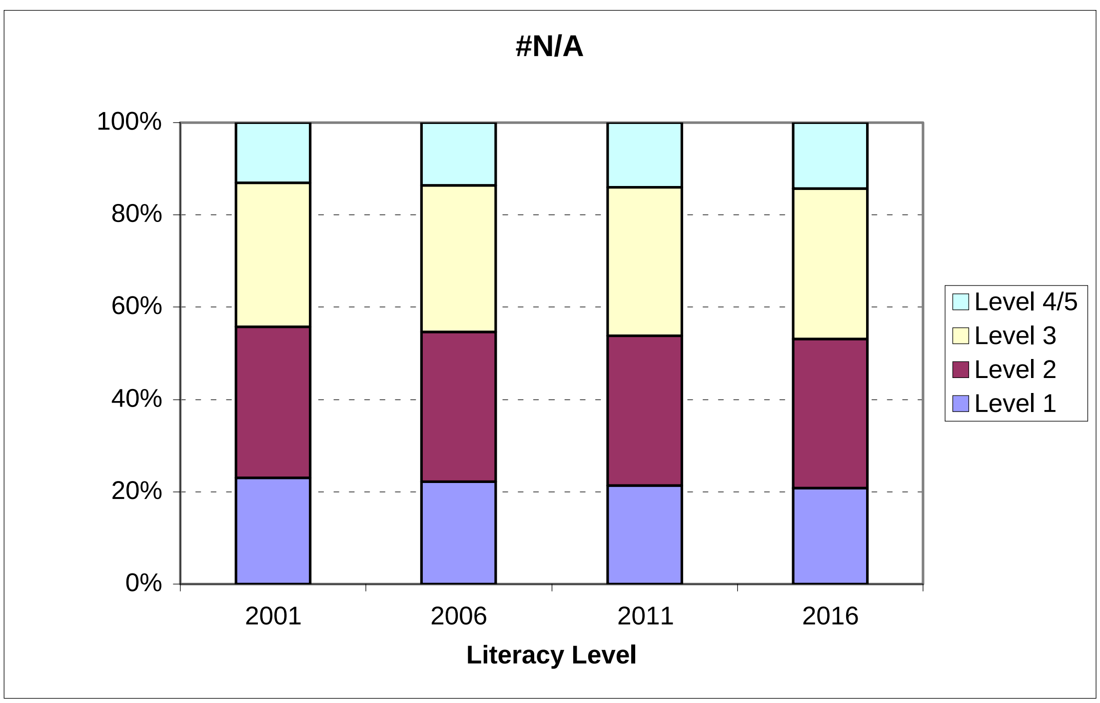




In New Brunswick the absolute numbers of adults with skills below Level 3 is projected to decrease from 295, 366 to 295,038 to 49,780 from 2006 to 2016, or 328 adults or .1%. The New Brunswick population is forecast to grow by 2.5.% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

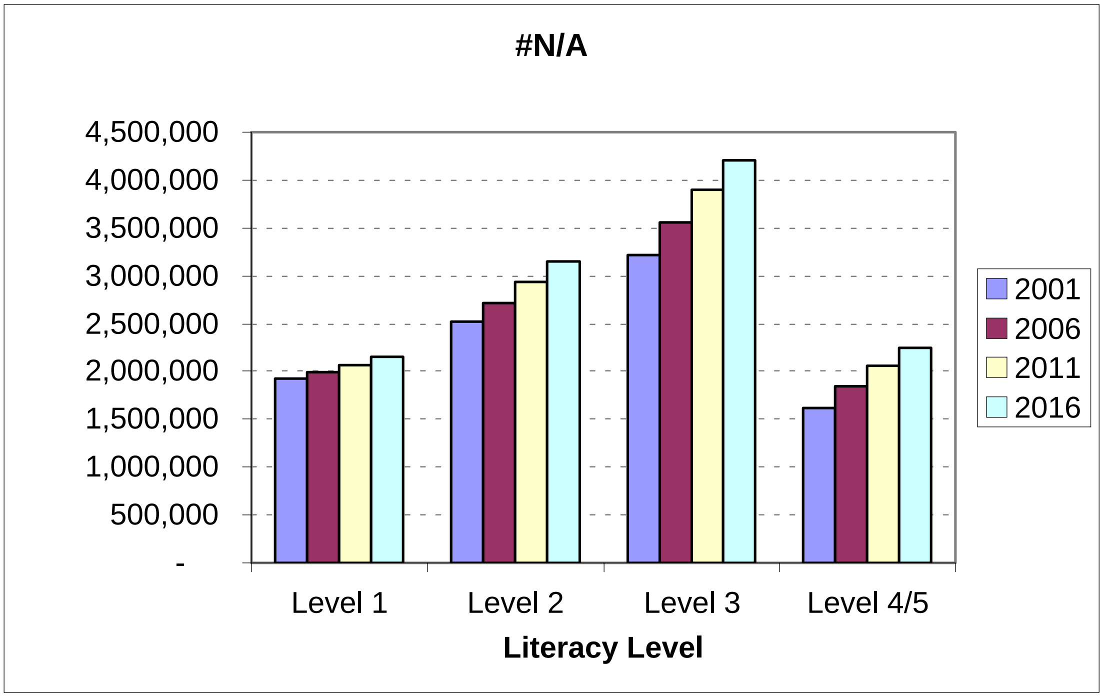
Quebec

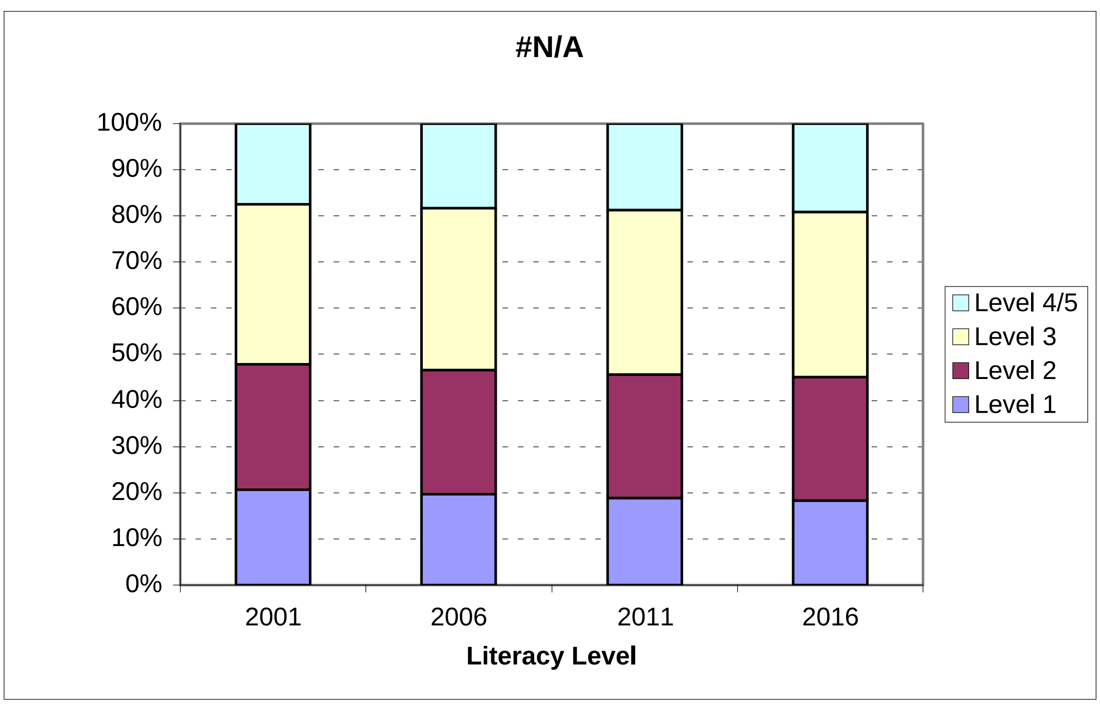




In Quebec the absolute numbers of adults with skills below Level 3 is projected to increase 95,086 from 3,360,840 to 3455926from 2006 to 2016, or 2.8%. The Quebec population is forecast to grow by 5.7.% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

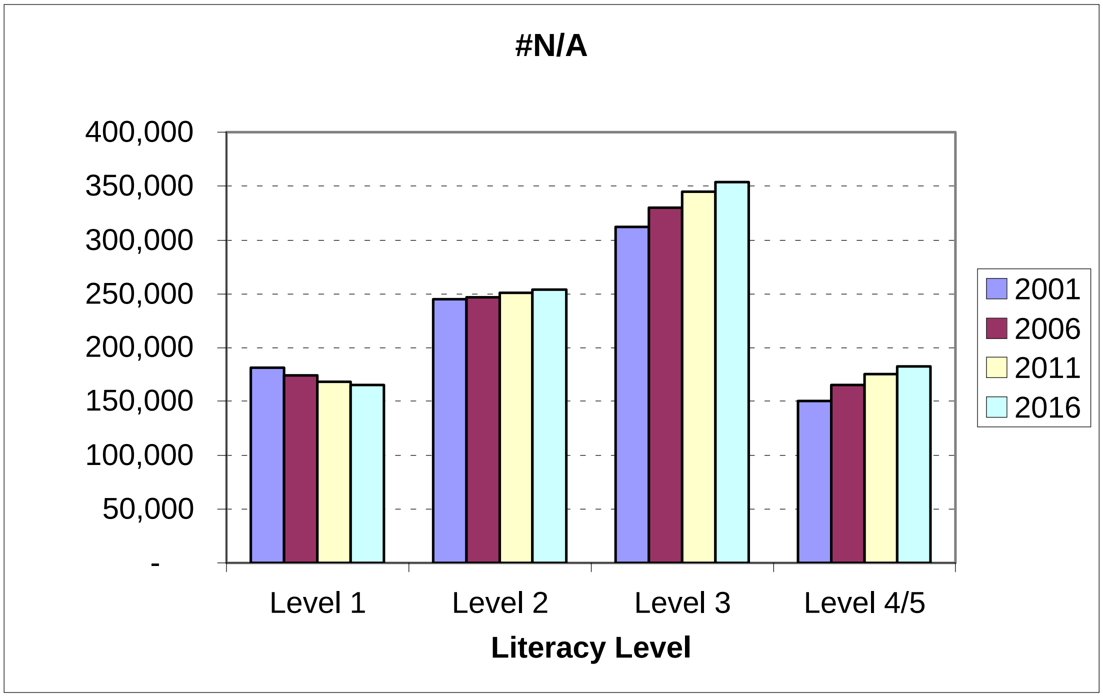
Ontario

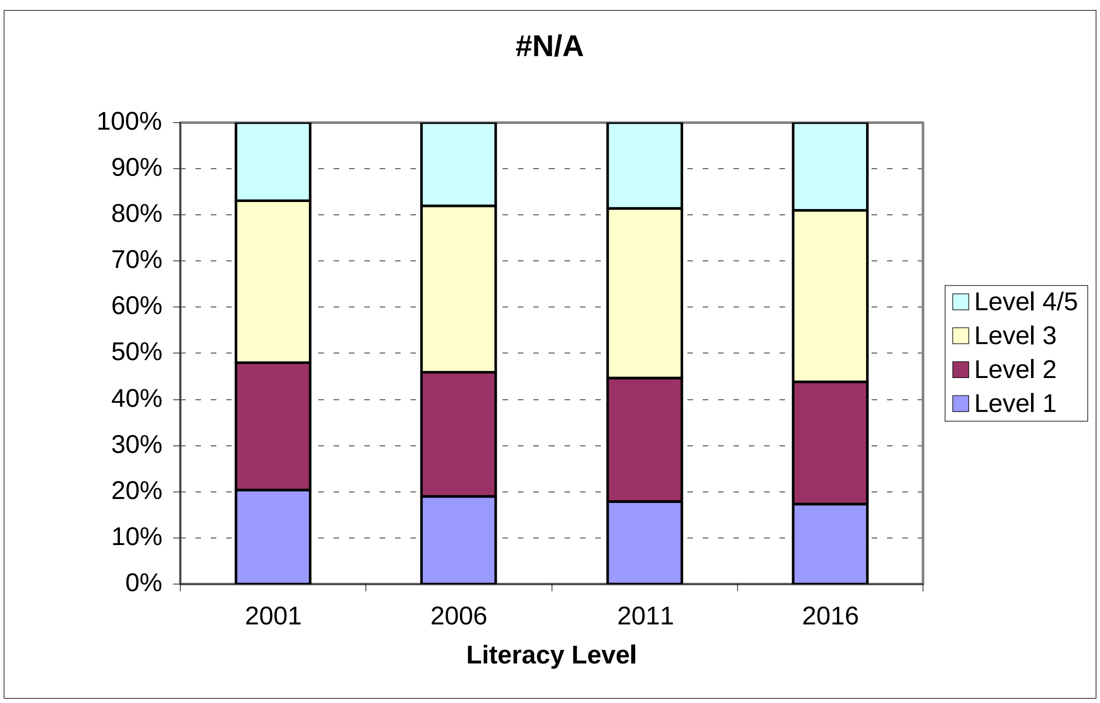




In Ontario the absolute numbers of adults with skills below Level 3 is projected to increase 599,043 from 4,703,029 to 5,302,072 from 2006 to 2016, or 12.7%. The Ontario population is forecast to grow by 16.3% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

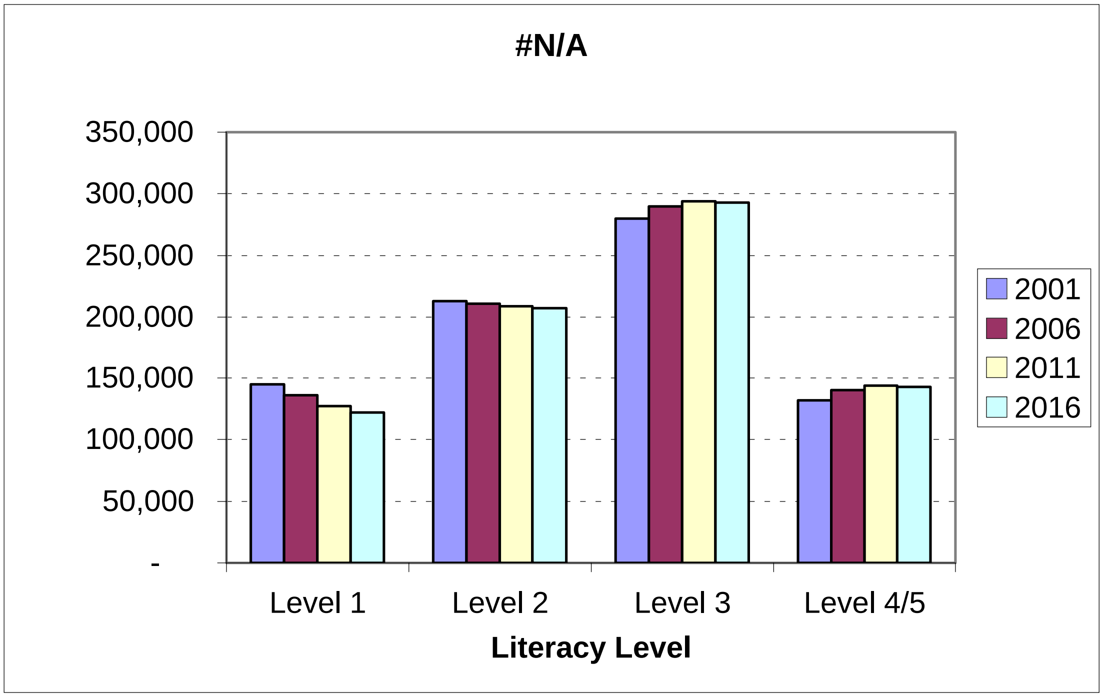
Manitoba

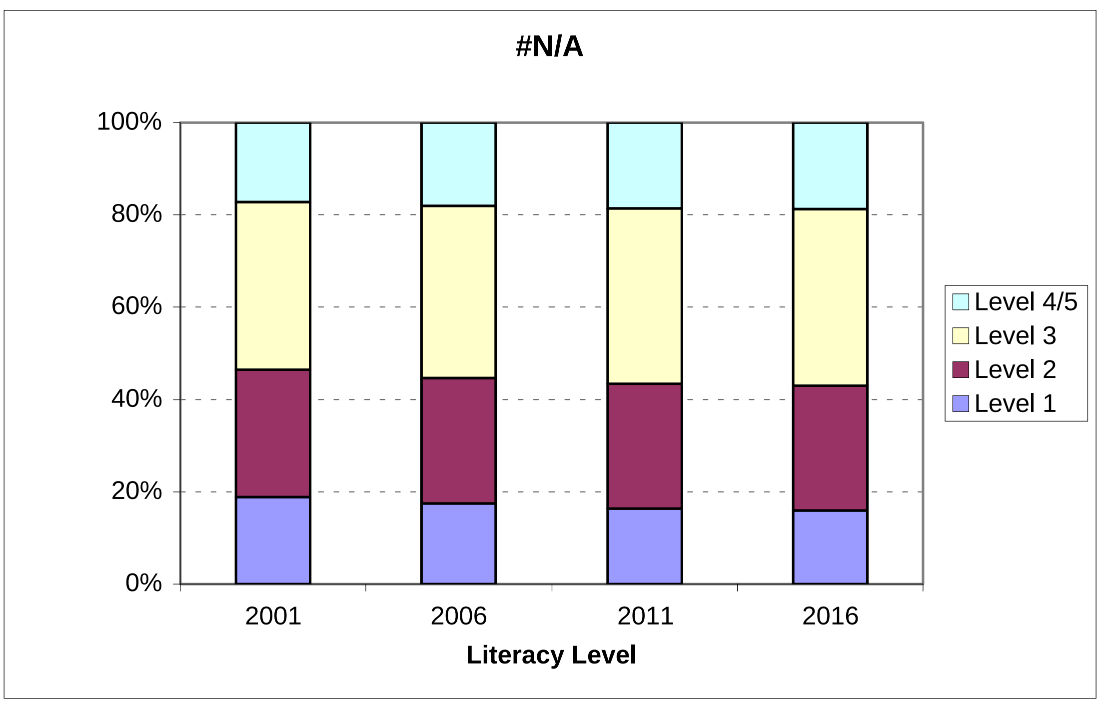




In Manitoba the absolute numbers of adults with skills below Level 3 is projected to decrease 2489 from 421,302 to 418, 812 from 2006 to 2016, or -.6%. The Manitoba population is forecast to grow by 4.3% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 2%.

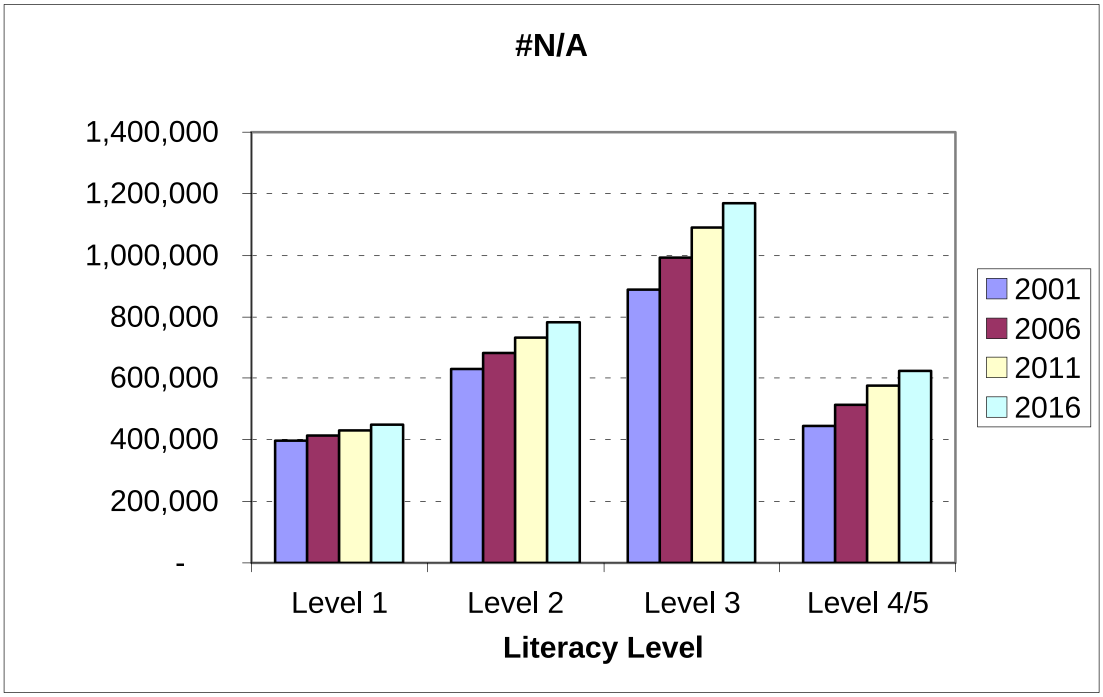
Saskatchewan

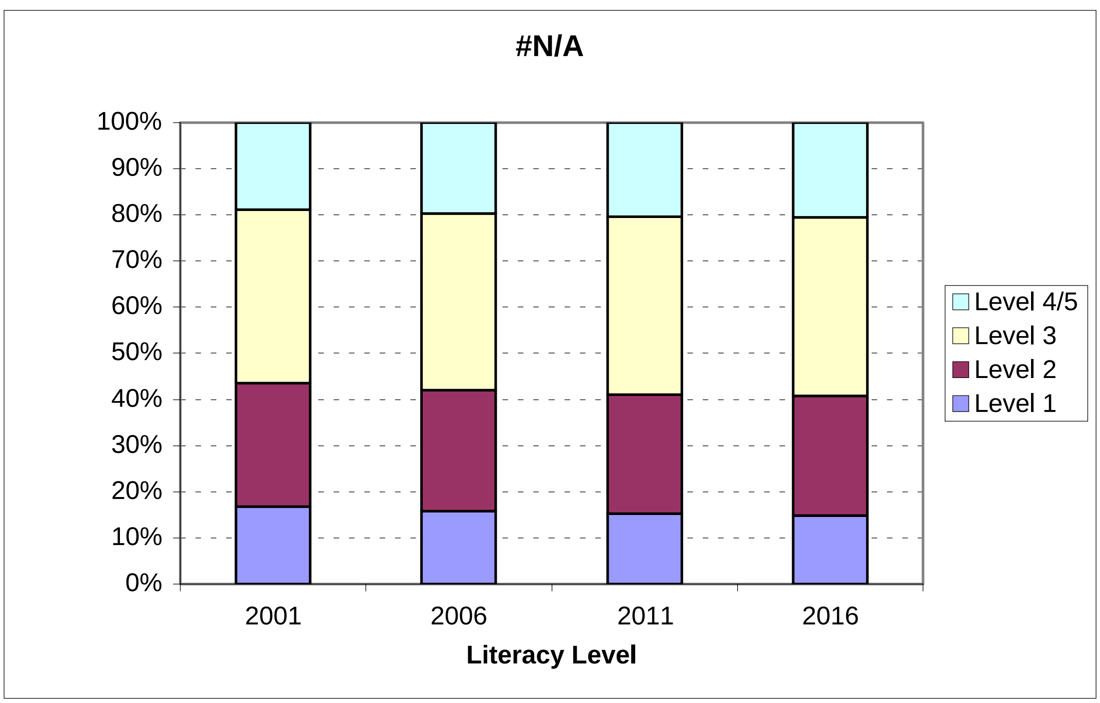




In Saskatchewan the absolute numbers of adults with skills below Level 3 is projected to decrease 17,124 from 346,178 to 329,055 from 2006 to 2016, or almost 5%. The Saskatchewan population is forecast to shrink by 1.4% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 2%.

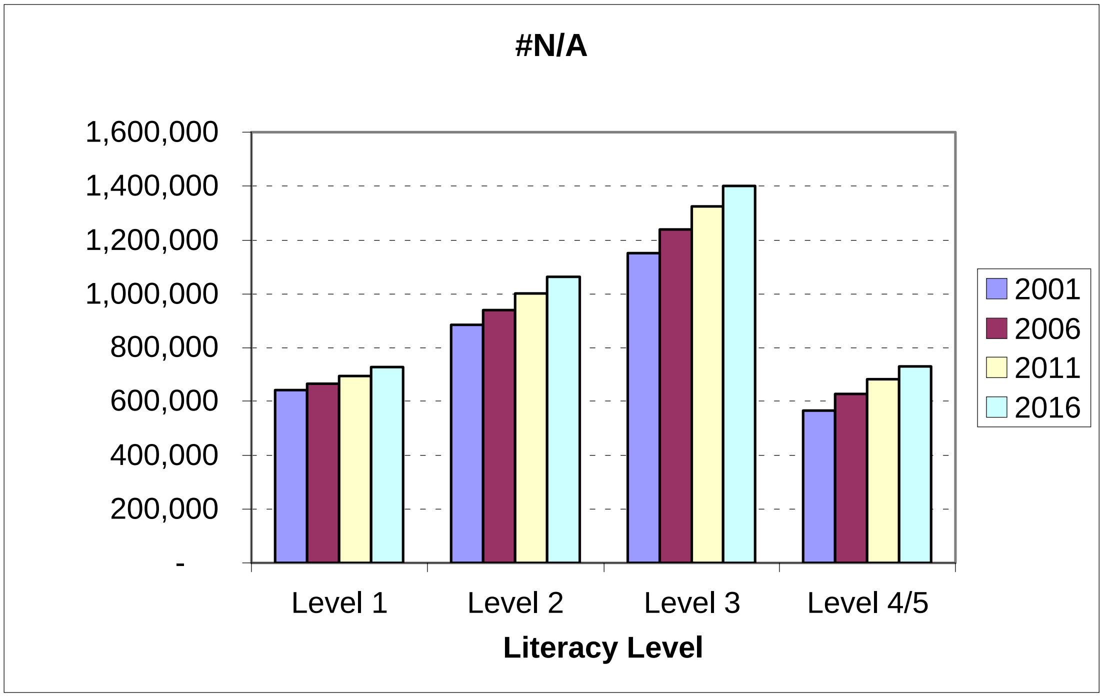
Alberta

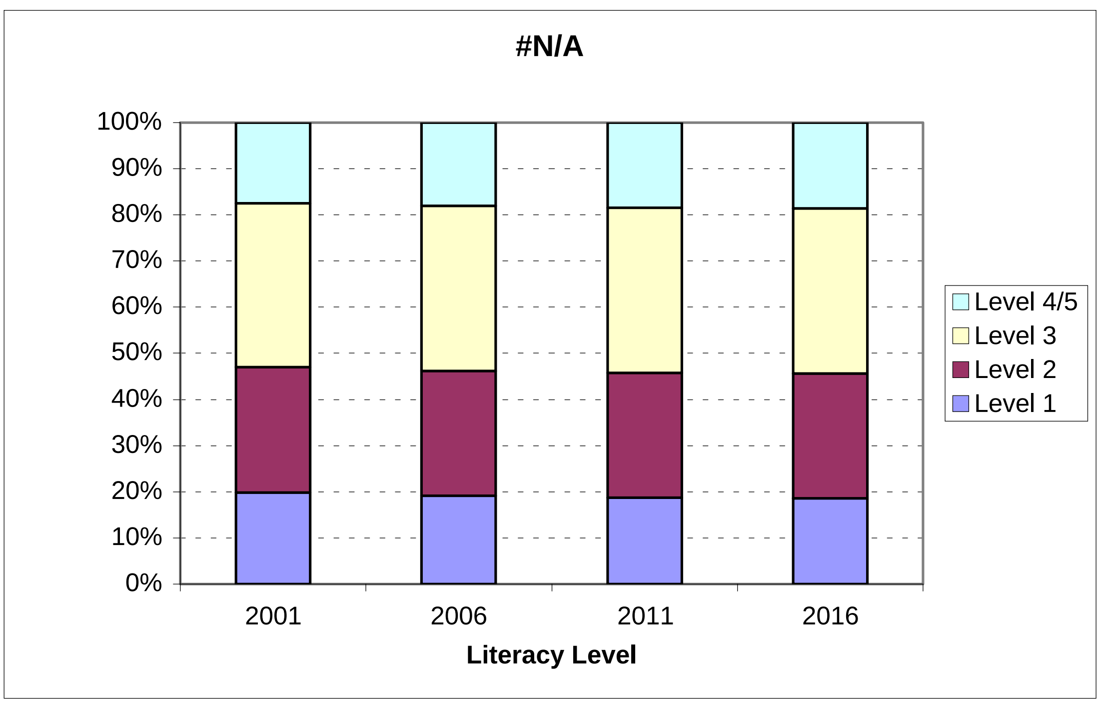




In Alberta the absolute numbers of adults with skills below Level 3 is projected to increase from 1,094,669 to 1,232,588 from 2006 to 2016, or 12.6%. The Alberta population is forecast to grow by 16.3% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

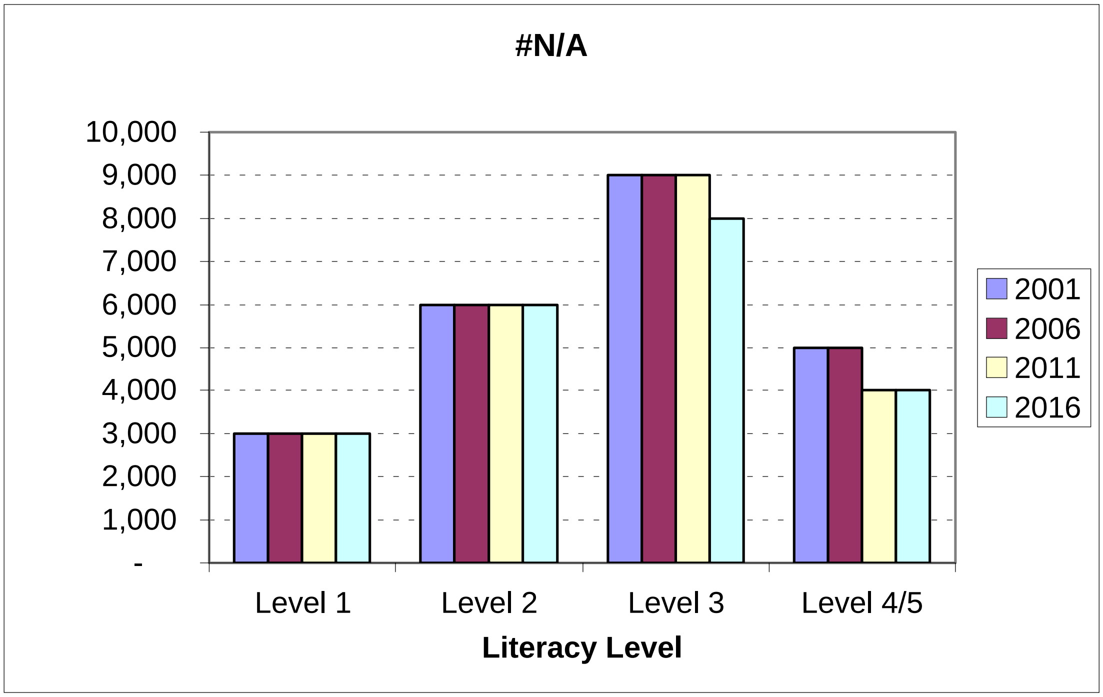
British Columbia

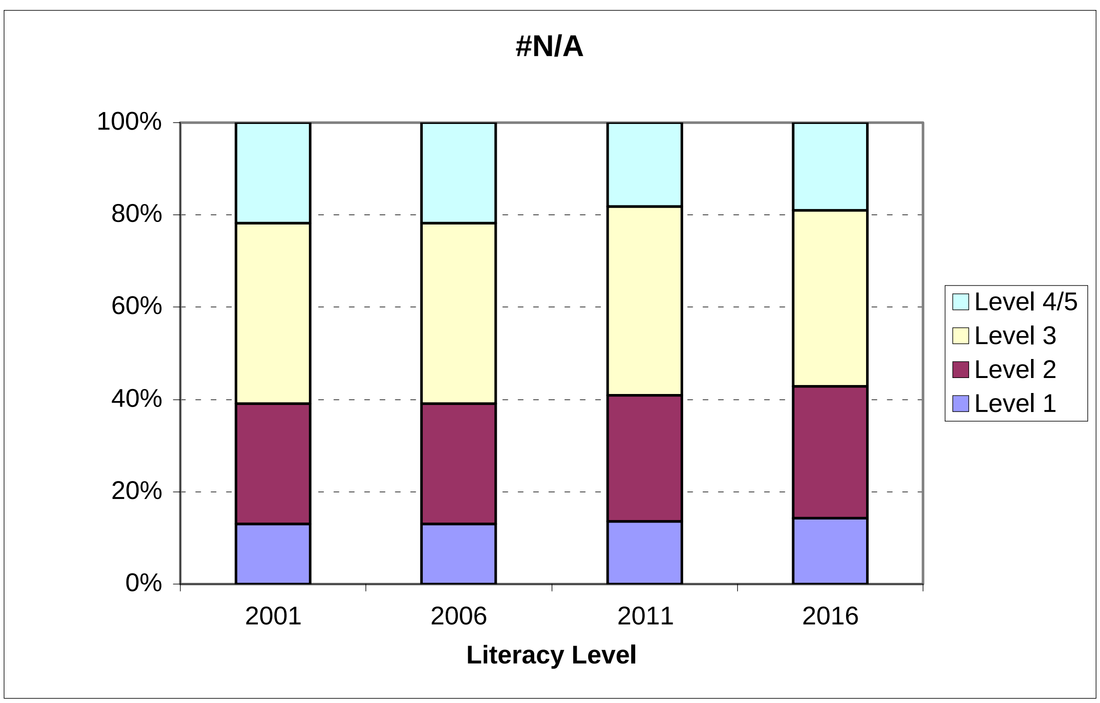




In BC the absolute numbers of adults with skills below Level 3 is projected to increase 186, 181 from 1,604,379 to 1,790,560 from 2006 to 2016, or 11.6%. The BC population is forecast to grow by 12.9% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 1%.

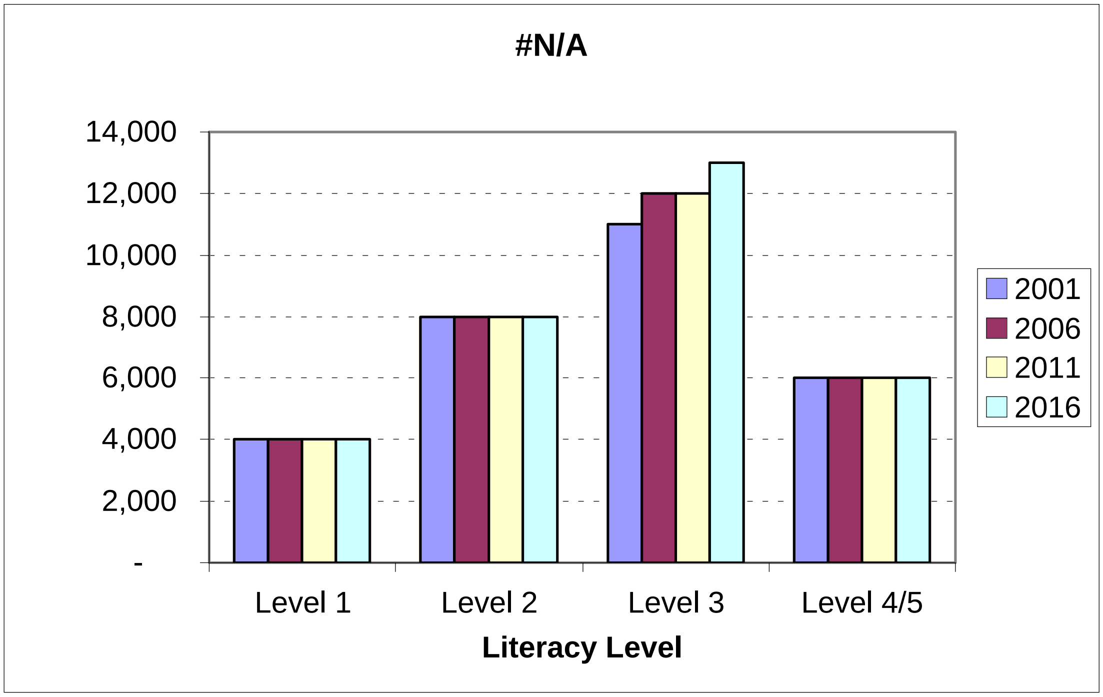
Yukon

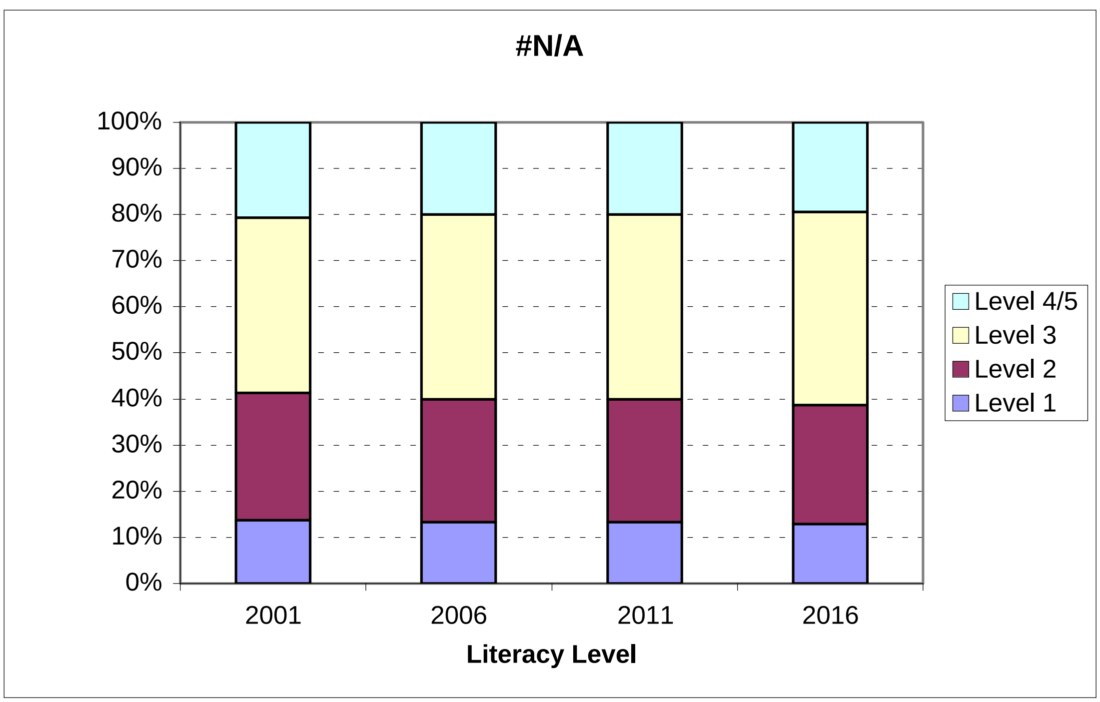




In Yukon the absolute numbers of adults with skills below Level 3 is projected to decrease 327 from 8,662 to 8,335 from 2006 to 2016, or 3.8%. The Yukon population is forecast to shrink by 7.7% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to grow by 2%.

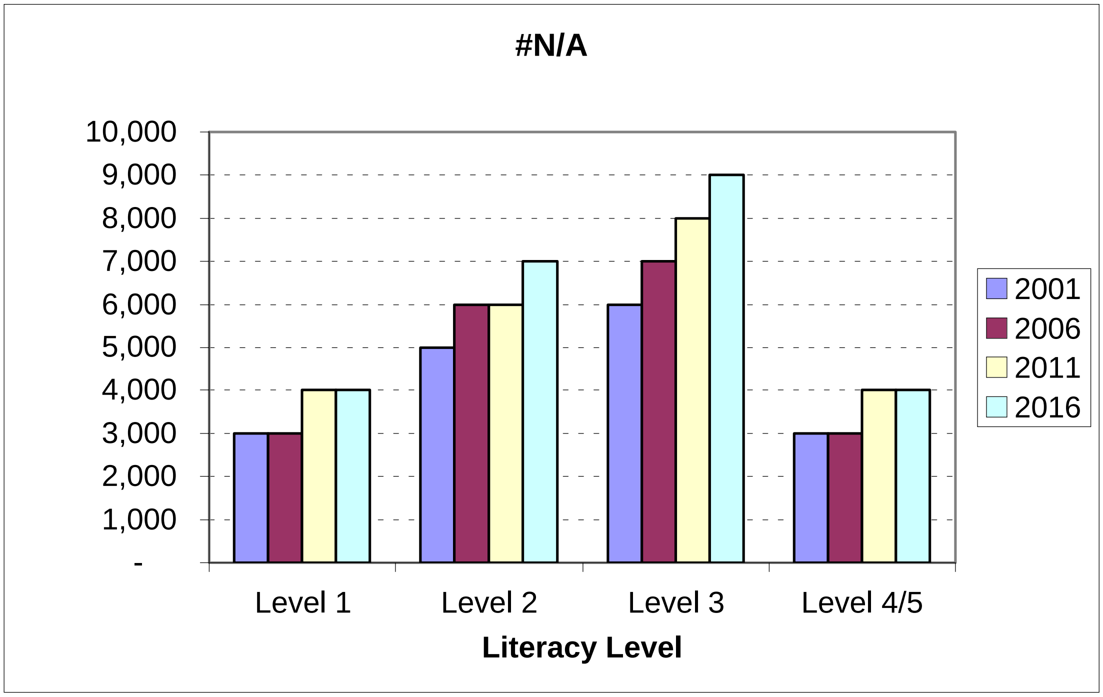
Northwest Territories

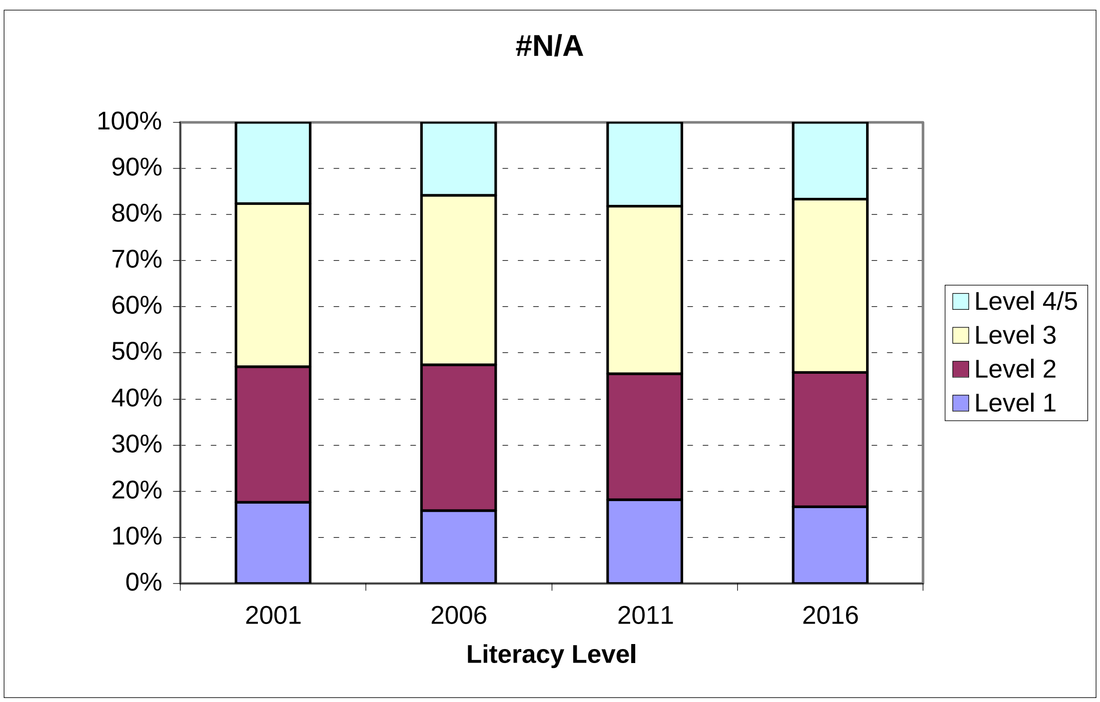




In NWT the absolute numbers of adults with skills below Level 3 is projected to increase 658 from 12,140 to 12,799 from 2006 to 2016, or 5.4%. The NWT population is forecast to grow by 6.0% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to shrink by 3%.

Nunavut





In Nunavut the absolute numbers of adults with skills below Level 3 is projected to increase 1571 from 9,239 to 10,810 from 2006 to 2016, or 17%. The adults population in Nunavut is forecast to grow by 22.8.% over the same period. Over the same period the proportion of adults with skills below level 3 is forecast to grow by 1%.

The analyses reveal that no jurisdiction can rely upon current levels of investment in education and training to meet the rising demand for literacy skill over the medium term. This suggests that employers and jurisdictions must find additional ways to increase the stock of literacy skill.

These findings reveal that no jurisdiction can 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 supply of literacy skill if the economic consequences of literacy skill shortages are to be avoided.

The following table, drawn from the Canadian Council for Learning’s Reading the Future publication, 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

This chapter presents an analysis of literacy skill utilization, shortages and surpluses in Canada by industry and occupation as well as 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 and 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 in the Canadian economy.

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, and,

- 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.

Little doubt remains that literacy is an economically valuable commodity. The case for public investment in literacy is, however, less clear. Literacy skill is expensive to create and has economic value associated with the impact that it has on labour productivity and society that go beyond the individual. Such group benefits, referred to as externalities in the economics literature complicate questions of who should bear the cost for remedial investment in adulthood. Whatever the optimal mix of public and private investment 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. Thus it is reasonable that public policy attempt to optimize the use of the available literacy supply .

These analyses fit into a broader framework. Labour economists have advanced several competing theories in their efforts to reconcile the available empirical evidence related to literacy skills with the initial underlying theory. For example, the theory of labour-segmented markets, which was popularised by Doeringer and Piore (1971), has traditionally differed from human capital theory in terms of its focus. It has tended to emphasise the characteristics of jobs and job markets, rather than the characteristics of individuals (Duncan and Hoffman, 1979). The labour-segmented markets theory suggests that different labour markets operate under different circumstances such as regulations, technology, demand and supply, which leads to varying pay and benefits. Many proponents of the theory have suggested that worker productivity and pay are determined more by the job and its technology than by the human capital of the worker (Velloso, 1995). These conclusions are mostly based on studies that view labour-segmentation as a function of industry. In many such studies, job characteristics are not viewed from the point of view of the individual characteristics (i.e., human capital) needed to carry out occupational tasks. In the current context labour-segmented theory would predict that literacy shortages would impose costs on firms and workers with the size of penalty reflecting the decrease in productivity associated with higher error rates. The same theory predicts that literacy surpluses would not yield productivity benefits since the extra skills offer no economic value.

In contrast, there are other studies (e.g., Osberg *et al.*, 1989, Raudenbush and Kasim, 2002) that have considered labour-segmentation as a function of occupation. This approach explicitly makes individual characteristics such as human capital relevant, since they are needed to carry out the tasks of different occupations. Osberg *et al.* (1989) state that because of subcontracting and other developments, industry-based classifications of economic activity are becoming increasingly unreliable, and thus there is a need to emphasise the occupational composition of the labour force.

The latter approach to viewing labour-segmentation allows for the consideration of whether the returns to qualifications and skills vary by different types of occupations. Demand side data on occupation skill standards identifies considerable heterogeneity in the skill content of jobs (HRSDC, 2006). In this variant literacy shortages would impose costs on firms and workers with the size of penalty reflecting the decrease in productivity associated with higher error rates. In this view literacy surpluses would yield productivity benefits since the extra skills offer economic value associated in part with the positive impact they have on workers ability to use technology.

Another important theory is signaling theory (Arrow, 1973; Spence, 1973; Riley, 1976; Weiss, 1995). Because employers have imperfect information concerning potential employees, such as their ability and future productivity, they face a dilemma when they are hiring. Therefore, they have little choice but to infer applicants' abilities to produce by relying on their qualifications that are validated and recognised, such as educational attainment. In short, the theory suggests that education acts as a signaling or screening device for unobserved characteristics. Even though education is only a proxy for human capital, it is vitally important by serving as a screening or filtering function. Indeed, there are findings (e.g., Black and Lynch, 1996: 266), which suggests that educational credentials are important to employers when hiring, and thus play an important role in providing access to occupations. Signaling will tend to reduce the observed economic returns to skill to the degree that educational credentials are only partially correlated with true skill. The returns to literacy skill would, however, be expected to rise with employment tenure as employers gain more knowledge about their

Employees true skill levels.

Much of the research literature suffer from a common weakness – without direct measures of human capital they are constrained by the assumption that those with a specified level of education possess similar knowledge, skills and other attributes. The observed variation in wages within occupations is much larger than can be explained by differences in educational attainment. Such variation is undoubtedly the product of underlying variation in the degree to which firms employ and reward skill and in the actual skill levels of workers, including their literacy skill.

Neither the design of the IALS study, nor that of the ALL study, offers any insight into inter-firm heterogeneity with respect to skill utilisation and reward. These studies do, however, provide direct measures that allow for specific skills to be separately valued from the many characteristics that education is supposed to indirectly measure. It also allows for an improved understanding of the correspondence between the inputs and outputs of the human capital formation process. If a particular skill is valued independently from schooling, then schooling may continue to proxy for other unmeasured characteristics.

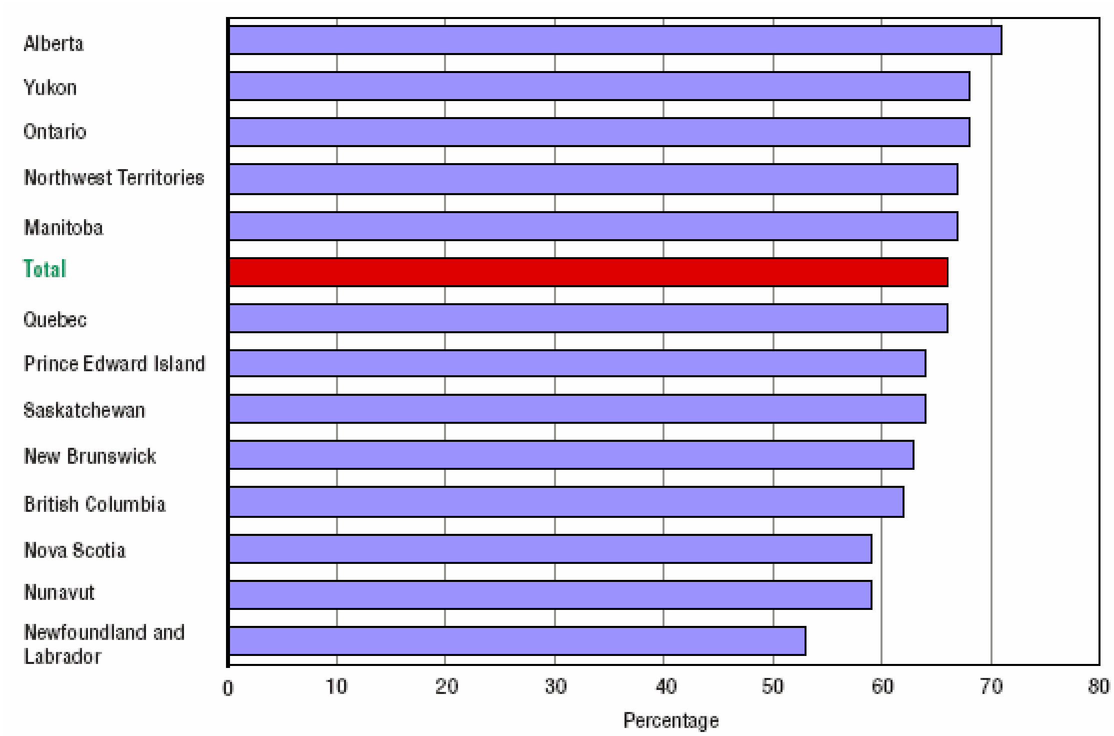
The fundamental question is whether literacy skill demand is intrinsically determined by the occupational and industrial structure of employment or whether the supply of literacy skill influences the level of demand. One of the authors has written that employers respond to labour pools with large numbers of low skilled workers and employees with inadequate literacy skills by adopting less productive work organizations and technologies of production (OECD and Statistics Canada, 2005.) If this is true then literacy skill shortages have a negative impact on the long term growth of GDP.

Increasingly, the evidence would seem to suggest that literacy skill is a fundamental determinant of productivity, one that provides stable returns over the entire wage distribution (Murray and McCracken, 2009). Analysis conducted by the authors as background for this report supports this assertion. It shows that each point of literacy beyond the level predicted by ones age, gender, education, mother tongue, immigrant status, aboriginal status and place of residence yields an earnings premia of $155 that is reasonably stable over all literacy and wage levels (see Annex C). This can interpreted as the marginal return to literacy (and skills and knowledge that depend on literacy or are highly correlated with literacy) and a first order approximation of the cost of literacy skill shortages.

With this background the analysis turns to exploring how literacy skill supply and literacy skill demand. The analysis uses four metrics. The first compares aggregate supply and demand in literacy points as a measure of overall market efficiency. The second compares aggregate literacy supply and demand in literacy points to provide a second measure of market efficiency that focuses only on the employed population. It answers the question "To what degree does the current distribution of employment by occupation make full use of the supply of skill of employed workers?" Because, either directly or indirectly, literacy skill influences both the probability of employment and occupational destination the gaps between aggregate supply and demand revealed by the latter metric should be smaller. The third metric compares aggregate literacy supply to literacy demand within each demand proficiency level. This analysis allows one to isolate more precisely where literacy shortages and surpluses are situated. The fourth metric compares literacy supply and demand at the individual level. These analyses yield estimates of the literacy skill shortages by industry, occupation and demographic characteristics in both absolute and relative terms i.e it identifies the number of workers in literacy skill shortage in each industry and occupation and the level of risk of being in shortage that workers in various industries and occupations face. Whether policy aims to reduce the overall number of workers in shortage or to narrow the range of relative risks observed across groups or tries to do both will influence where available resources are optimally targeted and how much improvement can be wrung out of a given investment.

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 analyses of individual literacy skill shortages and surpluses that follow later in the chapter.



Source: 2006 Census, ES profiles

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%).

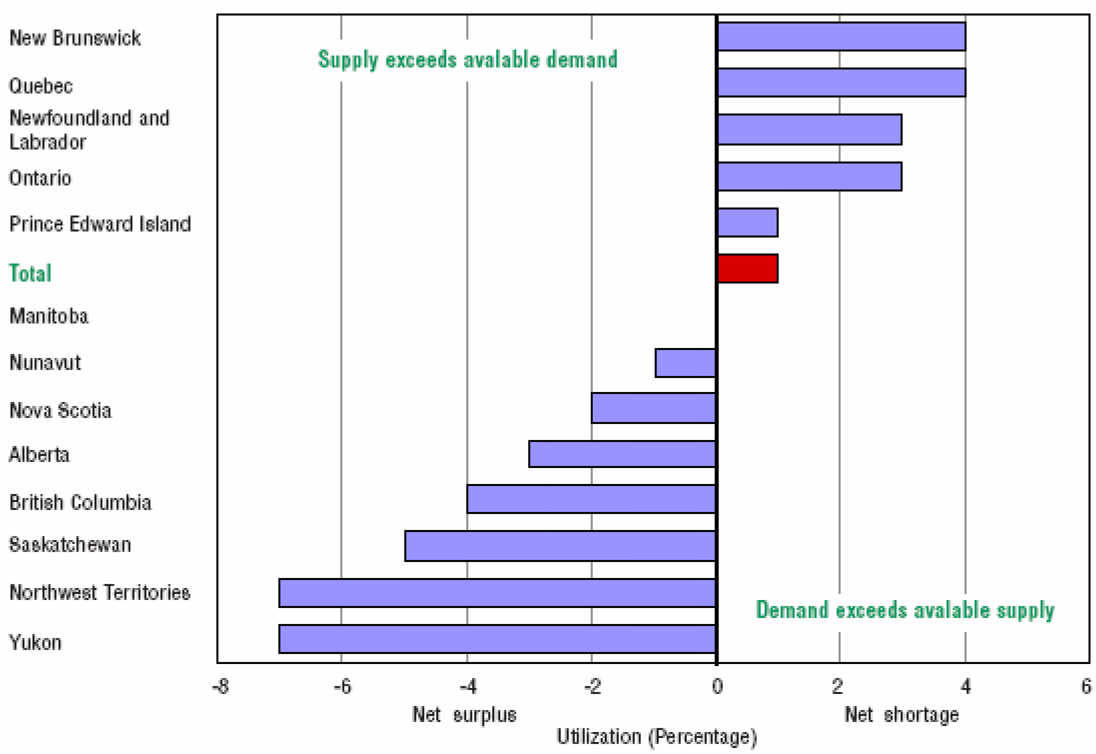
- Jurisdictions with relatively low aggregate utilization rate could, in theory, realize large GDP gains simply by making more effective use of the available pool of skill. This would require the introduction of demand-side measures.

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



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.

- Aggregate 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.

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

- For example the British Columbia economy demands only 96% of the available aggregate supply of literacy skill in the employed population. Thus, the performance of the British Columbia 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 4.3A and B extends the analysis of labour market efficiency by displaying the overall balance of supply and demand for Canada for all industries and occupations by the proficiency level demanded by the job at peak levels. Economic theory suggests that the efficiency of the economy will be highest if workers skills are closely aligned to the levels of demand needed for different types of jobs. Slight skill surpluses afford a cushion in times of rising skill demand whereas skill shortages imply higher costs associated with less efficient work processes and higher incidence of workplace illness and accident.

Figure 4.3A compares literacy skill demand to supply by level denominated in workers. It shows that:

- There is a significant surplus of workers with Levels 1 and 2 literacy skills: 3,577,099 and 1,168,854 respectively.

- The greatest shortage is of Level 3 workers: 4,943,610 workers in total.

- There is slight shortage of 530,383 Level 4 workers.

- There is a small surplus of 727,990 Level 5 workers

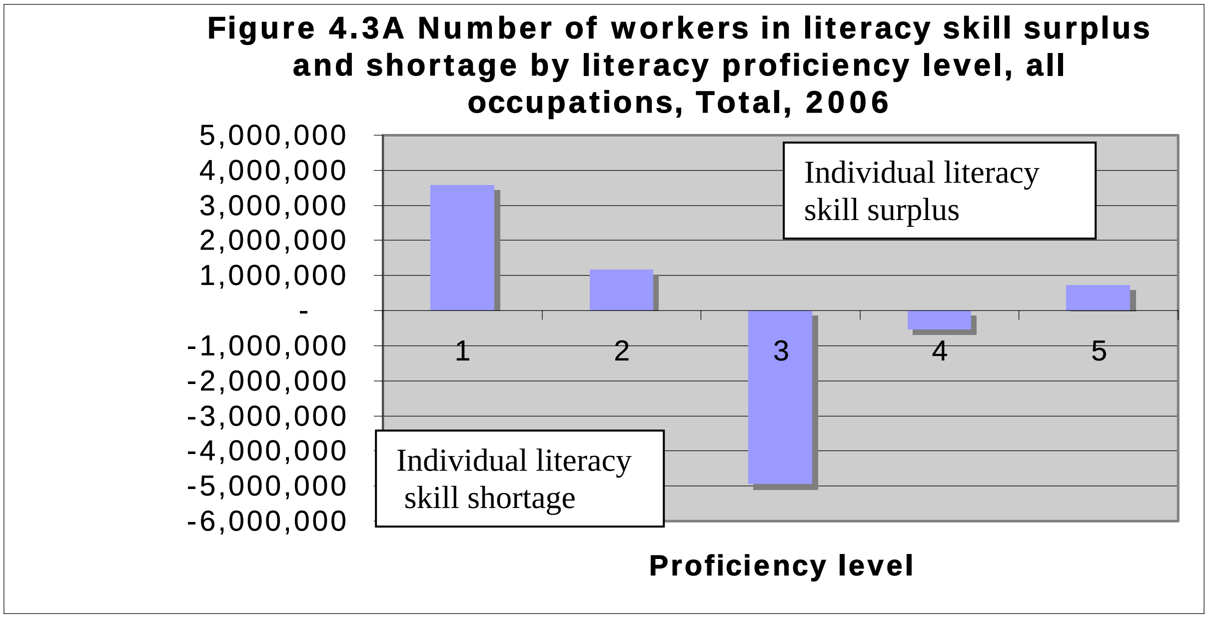
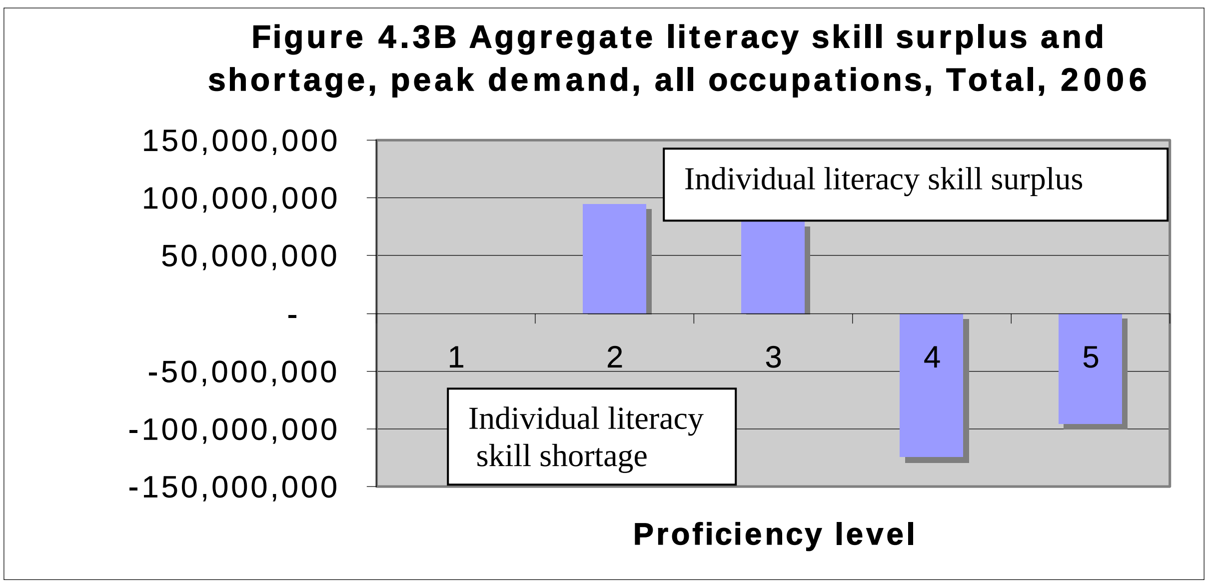


Figure 4.3B compares similar skill demand and supply by level but this time at the aggregate level denominated in literacy points.



The figure reveals several important facts, including that:

- When worker skills are matched to job demands over all jobs Canada has an aggregate literacy skill surplus of 46,141,950 points, or roughly 35 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 Canada 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 Canada. Canadian workers in Level 2 jobs possess 94,317,300 more points of literacy than required under peak demand. This represents an average surplus of 15 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 Canada. Canadian workers in Level 3 jobs possess 79,613,100 more points of literacy than required under peak demand. This represents an average surplus of 27 literacy points per worker in Level 3 jobs, an amount associated with roughly one year of education.

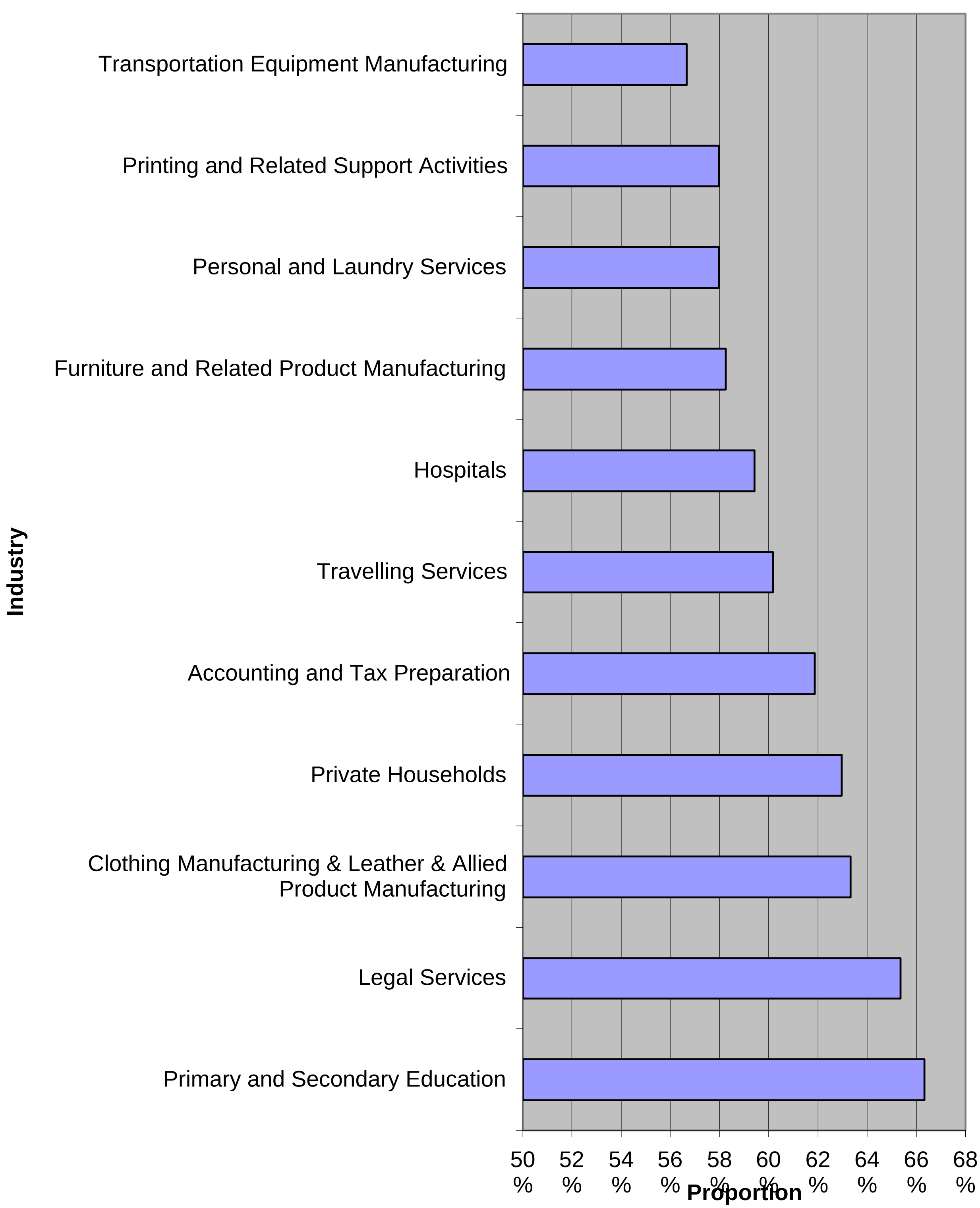
- Canadian workers in Level 4 jobs lack a total of -124,455,600 literacy points, an average shortage of 52 points, roughly equal to the literacy skill gain associated with two additional years of education.

- Canadian workers in Level 5 jobs lack a total of -95,616,750 literacy points, a skill deficit that represents an amount of 76 points per employee, roughly equivalent to the additional literacy normally gained through three additional years of education.

Figures 4.4 through 4.7 explore the industrial and occupational distribution of literacy skill shortages in Canada. Figure 4.4 lists the industries in Canada that have the highest proportions of employment below the required levels of prose literacy skill. Figure 4.5 lists the industries in Canada that have the highest absolute numbers of workers with skills below the required level of prose literacy skill. Figures 4.6 and 4.7 provide comparable information by occupation.

The availability of data on skill shortages by industry and occupation is by far the most important presented in this report as it provides a basis for employers to assess their training needs, public policy makers and means to know where risks are highest in absolute and relative terms and literacy organizations where their potential markets are. The information is sobering – even the industries and occupations with the lowest proportions of workers in shortage function with 20% of their workforce with skills below the levels identified in the Essential Skill profiles as needed to do their jobs well. Industries and occupations will the highest numbers or proportions of workers in literacy skill shortage will presumably have the most difficulty in adopting more productive technologies of production and work organization and will experience higher levels of worker illness, accident and material wastage. The productivity growth flowing from the reduction of the number of workers in shortage thus might represent a relatively low-cost way of Canadian firms remaining competitive. Moreover a significant proportion of skill shortages are associated with professional occupations in the public sector that demand high levels of skill including education and health. Eliminating these shortages might afford a means to improve the productivity of these sectors at relatively low cost. This prospect is particularly attractive in a health sector trying to cope with the demands of an aging population and rapid increases in input costs.

Figure 4.4 Proportions of workers below the required literacy skill level, selected industries, Total, 2006



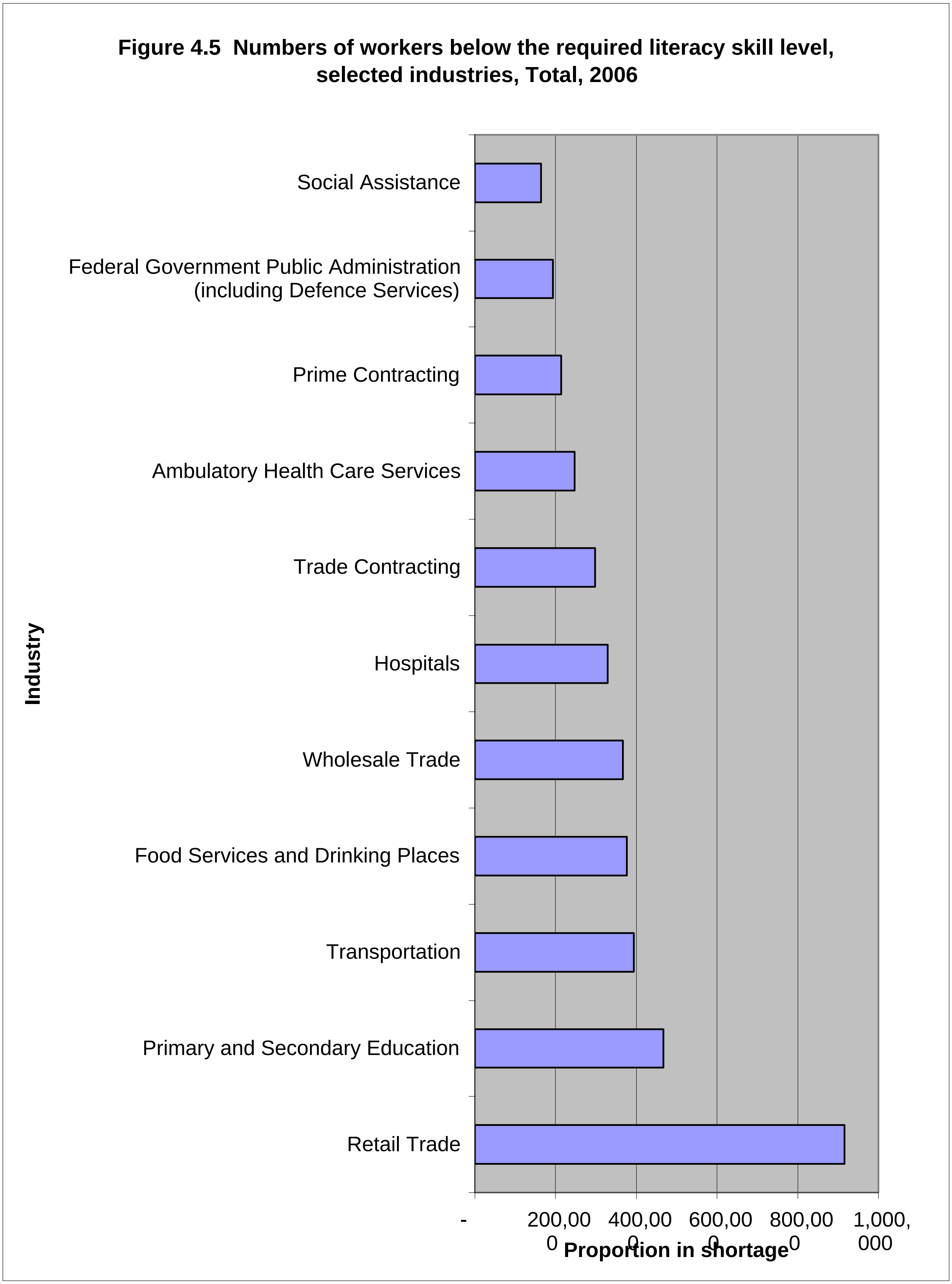
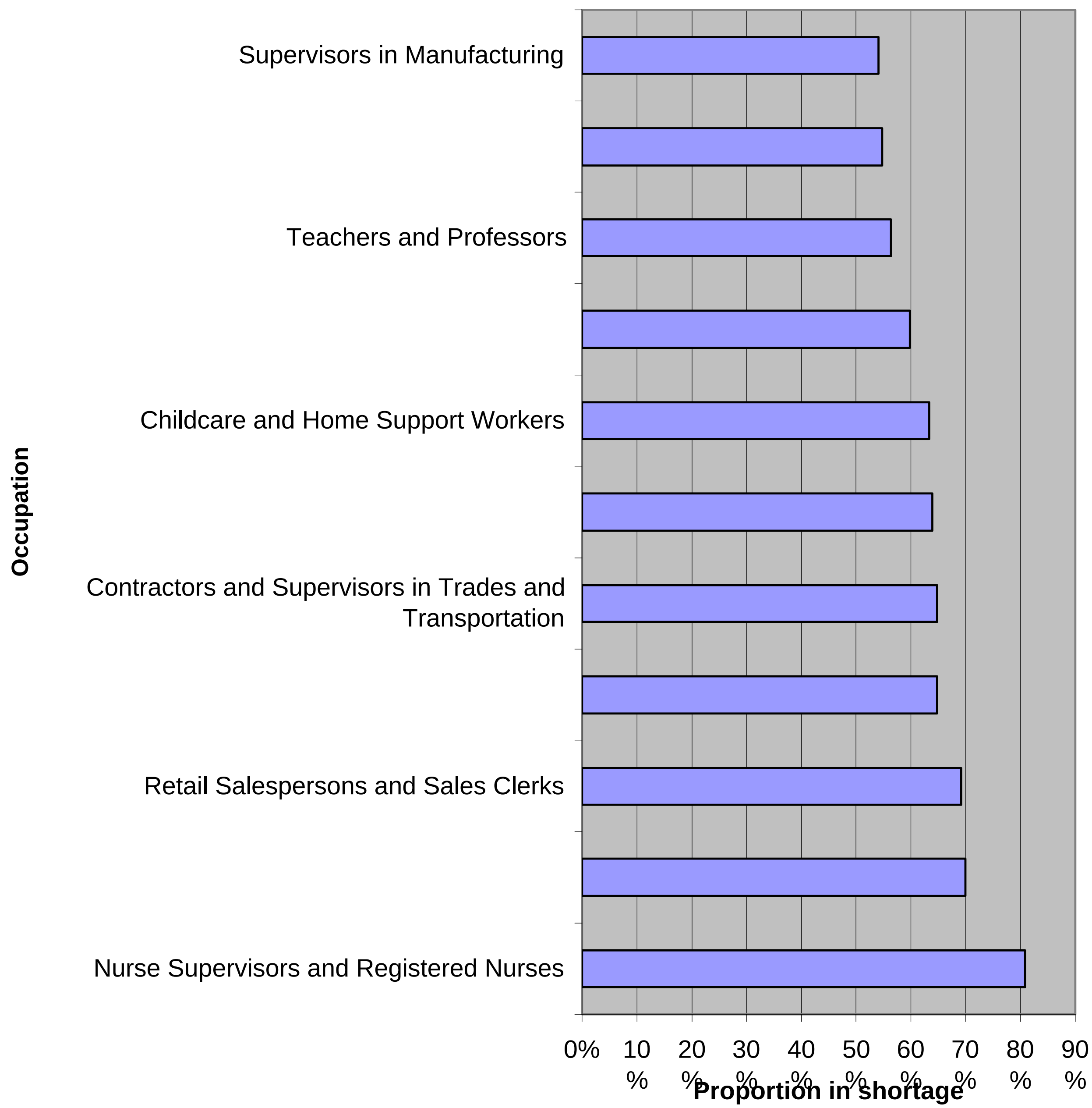


Figure 4.5 Numbers of workers below the required literacy skill level, selected industries, Total, 2006
Industry
Social Assistance
Federal Government Public Administration (including Defence Services)
Prime Contracting
Ambulatory Health Care Services
Trade Contracting
Hospitals
Wholesale Trade
Food Services and Drinking Places
Transportation
Primary and Secondary Education
Retail Trade
-
200,000
400,000
600,000
800,000
1,000,000
Proportion in shortage

Figure 4.6 Proportion of workers with literacy skills below the required level, selected occupations, Total, 2006



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

17 occupations in function with 50% or more of their workers in literacy skill shortage, including 8 that function with 60% or more of their workers in skill shortage and one that functions with over 80% of workers in 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%

The size of these individual skill shortages bears some discussion. To exist at these levels the costs of having low literacy skill must be minimal else employers would have found ways to eliminate them long ago. One possibility is that reading errors simply do not cost much to correct. Another possibility is that firms can afford costly errors because they face little or no competition. In such a situation they would just pass along the added cost to the consumer. Another possibility is that employers adjust their technologies of production and work organization to compensate for high proportions of workers with inadequate skills. For example they might acquire machinery and equipment that requires lower worker skills or introduce more levels of supervision. The associated reductions in productivity would mean that they would have to reduce wages and benefits commensurately and would be less able to adopt more productive work organizations and technologies of production. While this behaviour would protect them in the short run over the longer term it would make them less productive and ultimately render them less competitive. This is particularly worrisome in the current economic context. Faced with global competitors who have lower labour costs, who can buy all of the other inputs at the same cost and who can access large pools of workers with the needed skill levels then the inevitable result will falling living standards in Canada.

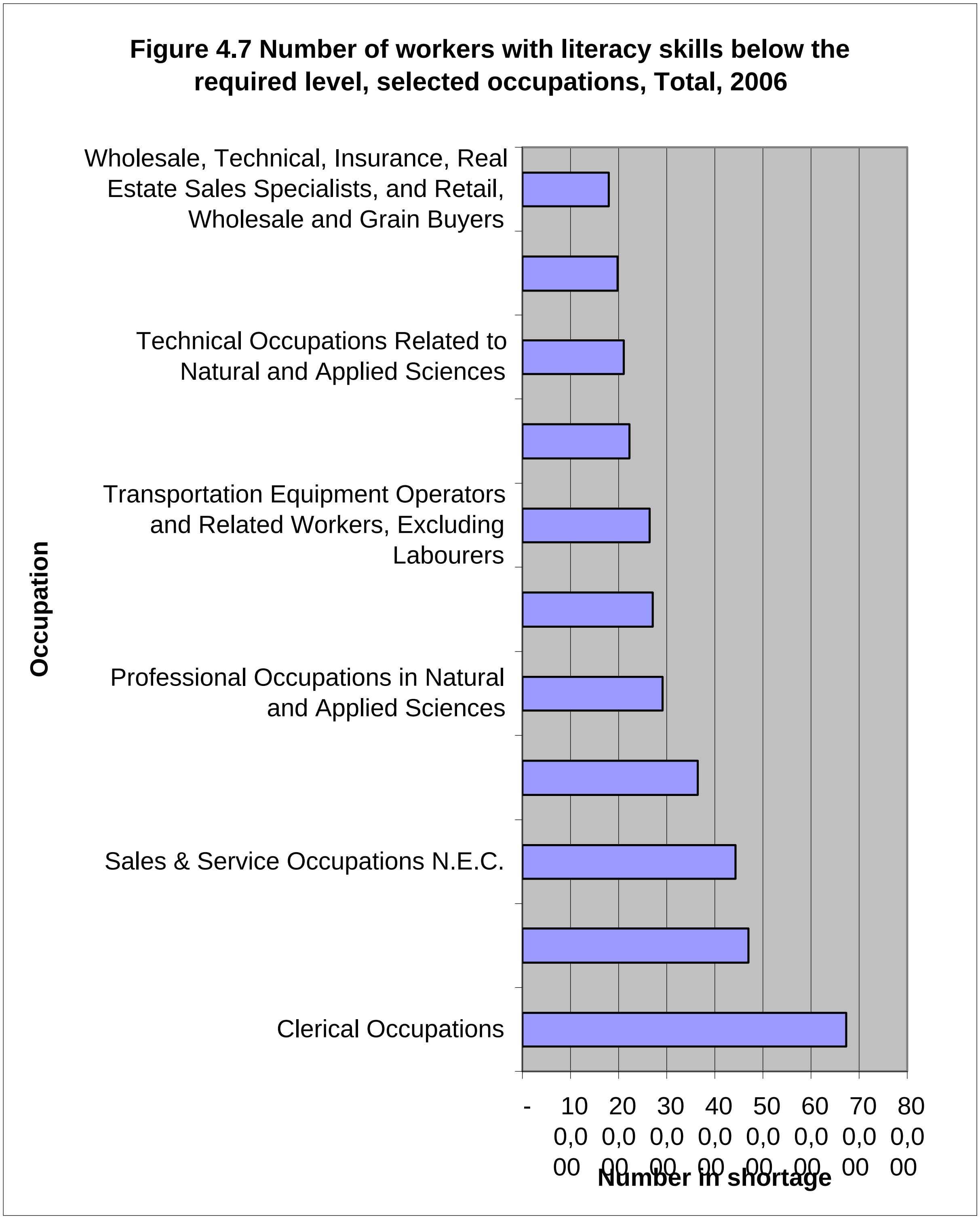


Figure 4.7 Number of workers with literacy skills below the required level, selected occupations, Total, 2006
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers
Technical Occupations Related to Natural and Applied Sciences
Transportation Equipment Operators and Related Workers, Excluding Labourers
Professional Occupations in Natural and Applied Sciences
Sales & Service Occupations N.E.C.
Clerical Occupations
Occupation
-
100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000
Number in shortage

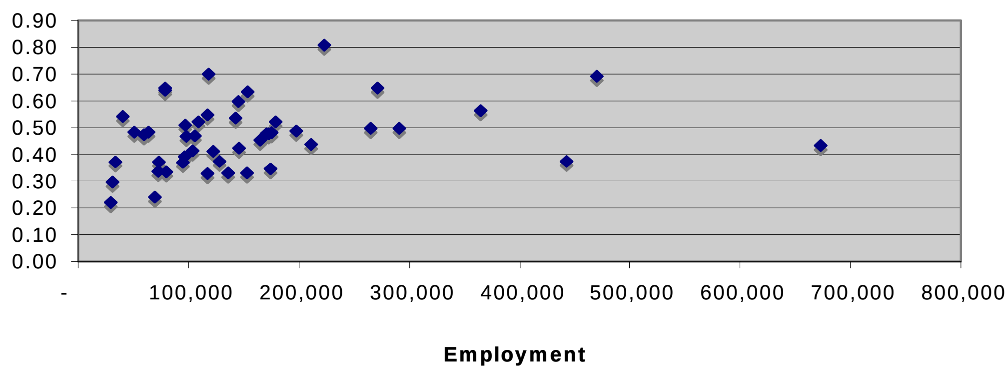
In total 8,113,531 employed workers are estimated to be in literacy skill shortage. The following 9 occupations have more than 200,000 workers in literacy shortage, totalling 43% of total shortages:

Clerical Occupations	672,917
Retail Salespersons and Sales Clerks	470,420
Sales & Service Occupations N.E.C.	442,785
Teachers and Professors	364,370
Professional Occupations in Natural and Applied Sciences	291,086
Professional Occupations in Business and Finance	270,956
Transportation Equipment Operators and Related Workers, Excluding Labourers	264,859
Nurse Supervisors and Registered Nurses	222,867
Technical Occupations Related to Natural and Applied Sciences	211,085

Simple arithmetic suggests that the dead weight of forgone productivity associated with this number of workers in shortage is enormous. On average the 8,113,531 are 35 points away from the bottom of the complex demand level identified in the ES profile. Assuming $115 per point is a reasonable proxy for the potential economic benefit that eliminating this shortage would yield then the forgone earnings are on the order of $32.7 billion.

Government can implement policies that serve to reduce inequalities among groups or ones that serve to raise average outcomes. Resource constraints generally preclude doing both simultaneously so policy makers face choices about which they value most. These choices are important because they influence the rate at which things get better. Figure 4.8 plots the absolute risk of workers being in literacy skill shortage by the relative risks they face for the full range of occupations.

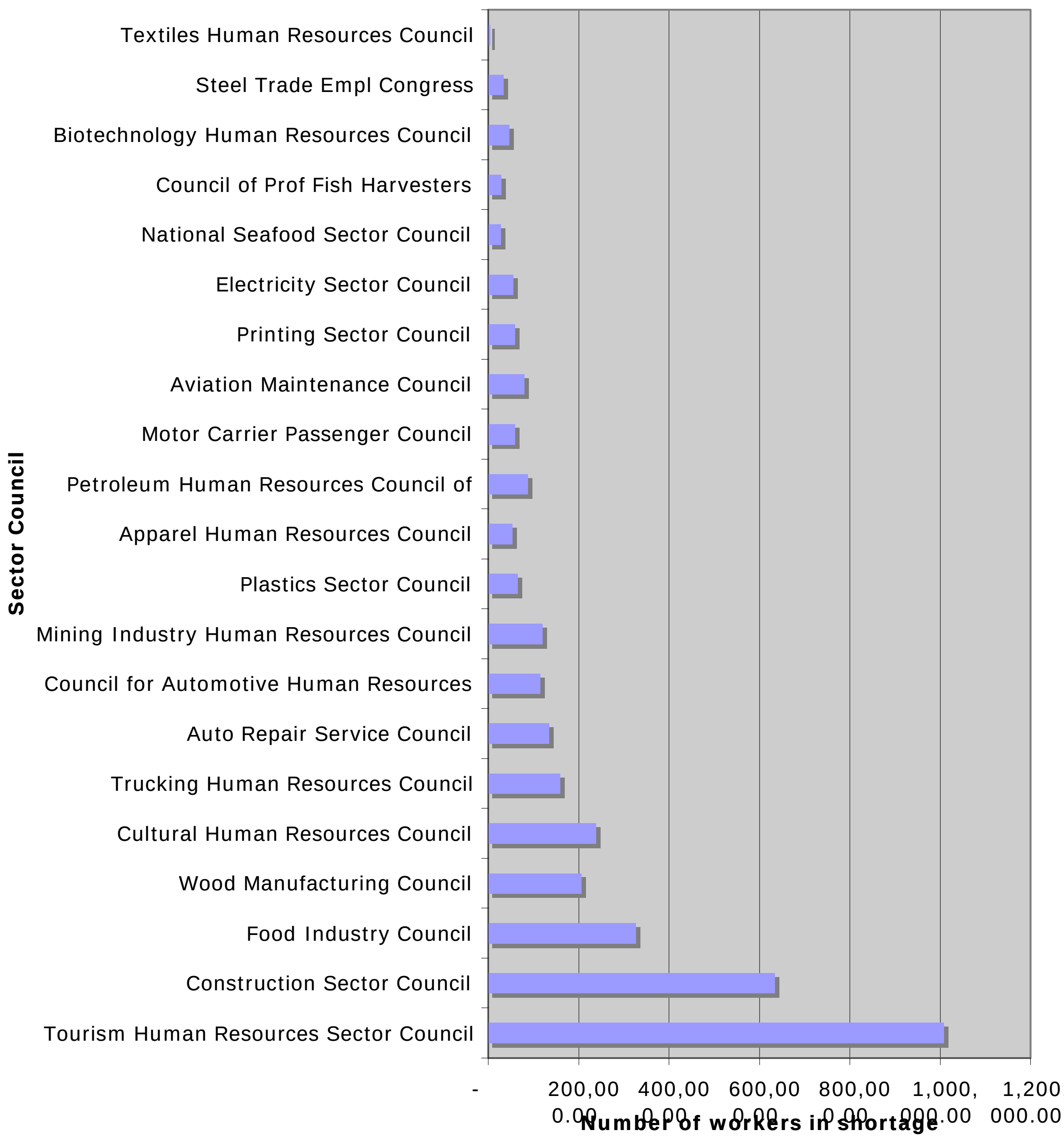
Figure 4.8 Number of workers with literacy skills below the required level by employment, selected occupations, Total, 2006



The figure reveals that a handful of occupations face high risks in both absolute and relative terms including clerical workers, sales and service workers and retail workers. Focusing remedial investments on these workers would yield the most rapid reductions in the number of workers in literacy skill shortage and in the inequality in the risk of being in shortage faced by workers from different occupations.

Figure 4.9 plots the number of workers in literacy skill shortage by HRSDC sector council. These sector councils afford a mechanism by which the provision of remedial instruction might be channeled and as a means to get employers to foot most of the required investment.

Figure 4.9 Number of potential learners by sector council, Canada, 2006



The figure reveals that 3 sectors – Tourism, Construction and Food – account for fully 1,968,450 potential learners or almost ¼ of the total number of learners. Focusing on these sectors and their needs would yield significant reductions in shortages and improvements in the productivity of the workers.

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 Canada.

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

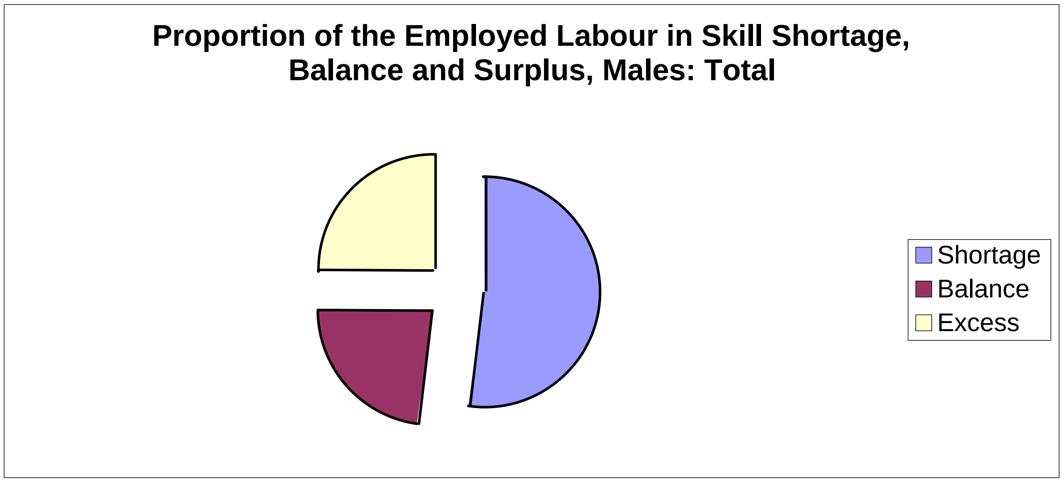
For example, older workers will be less likely to participate in literacy upgrading because they have less time to recover any economic benefits that higher skills might precipitate. Similarly, firms may be less likely to finance literacy upgrading for their older workers as they will have less time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

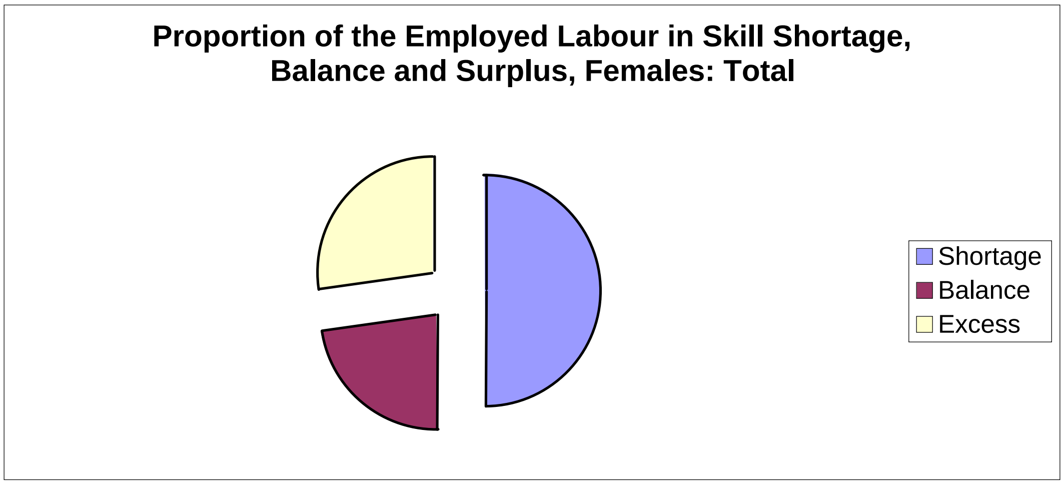
Figures 4.9 through 4.16 reveal the degree to which literacy skill shortage is concentrated within particular population sub-groups of the population. Figure 4.9 explores literacy skill shortages, balances and surpluses by gender.

Gender

Figure 4.9

The proportion of the employed labour force in skill shortage, balance and surplus by gender, Canada, 2006





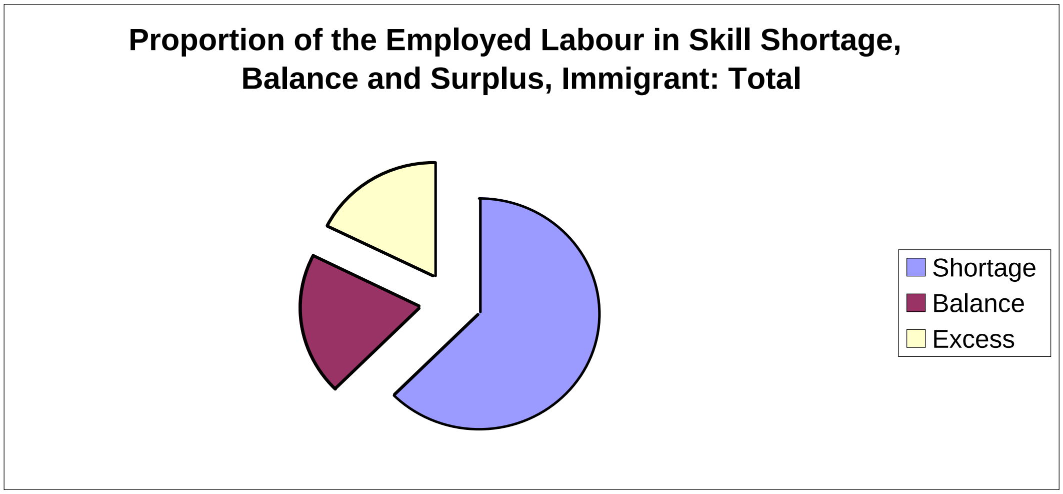
The figure reveals that employed men and women in Canada face roughly the same level of risk of being in skill shortage – 52% compared to 50%. Roughly half of both groups have prose literacy skills than are notionally required by their occupation under peak demand conditions.

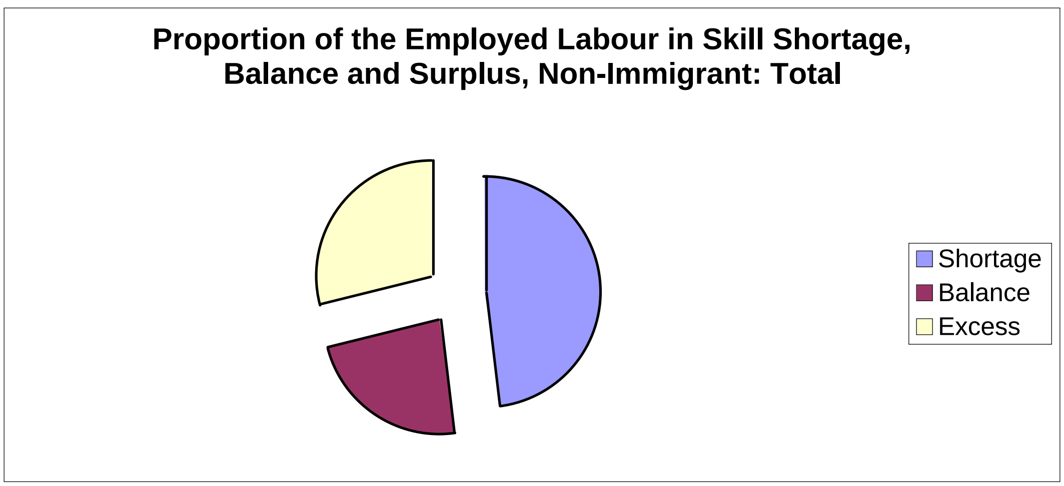
Women have a higher probability of being in skill surplus, a fact that can be attributed to the fact that, as a group, women have higher average literacy skill levels. 28% of employed women in Canada have surplus literacy skills v.s. 25% for men.

Immigrant status

Figure 4.10

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





The figure reveals that immigrants in Canada face a 15% higher risk of being in skill shortage than the non-immigrant population. 63% of immigrants in the employed labour force are in skill shortage compared to 48% 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 and/or 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).

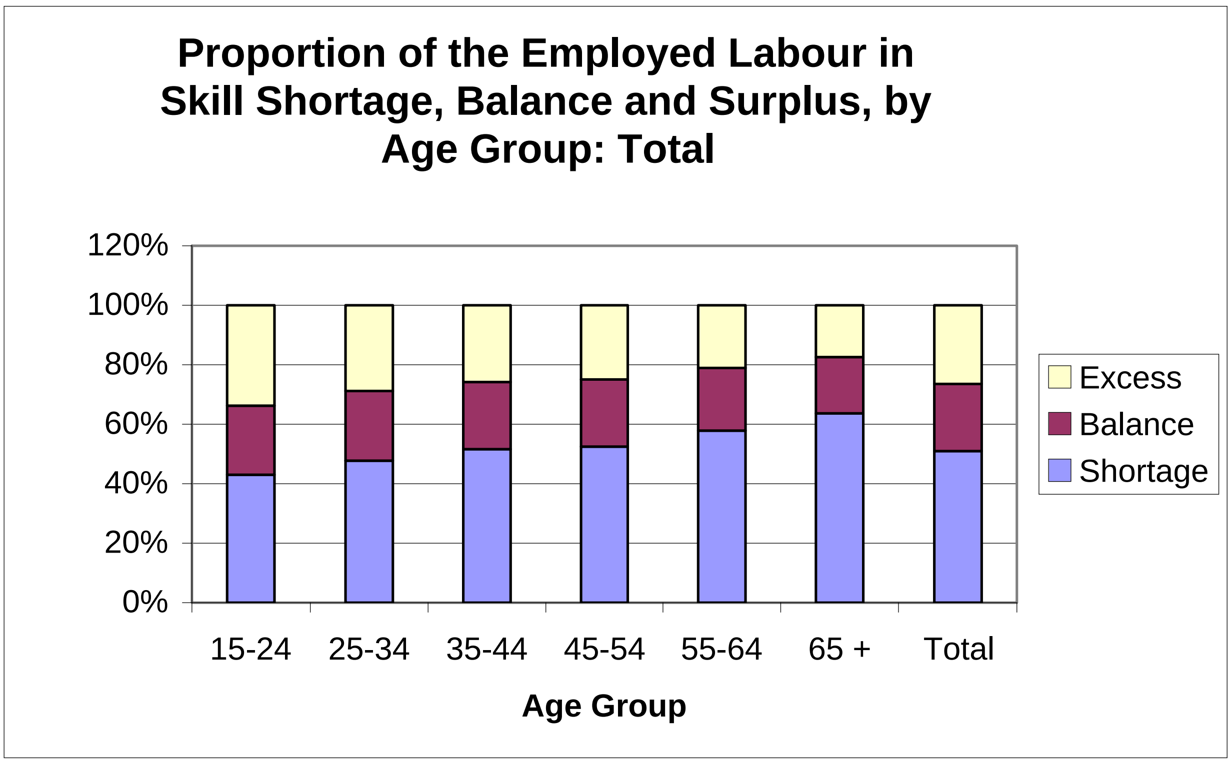
Immigrants in the employed labour force are also much less likely to be in skill surplus than their Canadian-born peers – 18% v.s. 29%.

Age groups

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 proportion of current employment in skill shortage, balance and surplus by age group, Canada, 2006



The figure reveals that literacy skill shortages in the Canadian employed population are high for all age groups, ranging from a low of 43% to a high of 64%. 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 (43%) 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 (64%). This finding suggests that the seniors who remain in the labour force have a very high probability of having low skills.

Aboriginal status

Figure 4.12

The proportion of current employment by skill status by aboriginal status, Canada, 2006

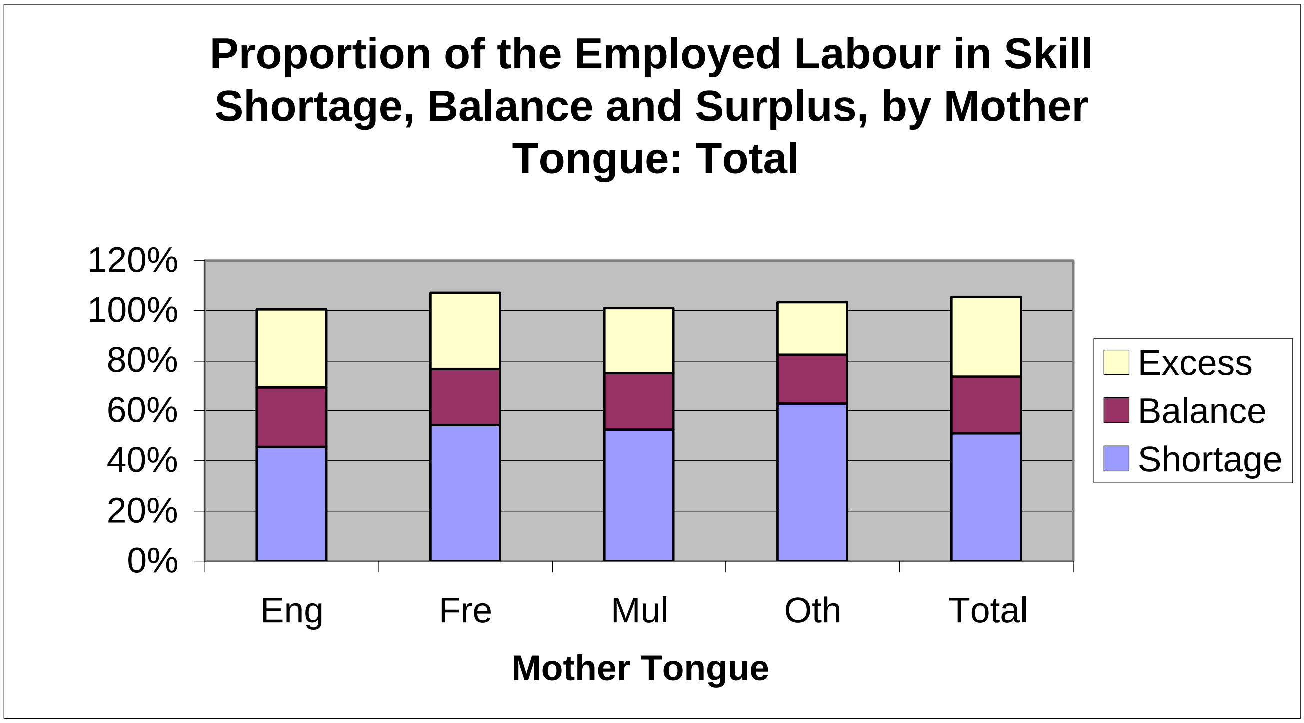
The figure reveals that a significant proportion, 47%, of employed aboriginal adults in Canada are in skill shortage. Employed Aboriginal adults actually face a slightly lower risk of being in skill shortage than their non-Aboriginal peers – 47% v.s. 51%. This finding is largely due to the fact that they are more likely to be in occupations that place low skill demands on workers.

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.

Mother tongue

Figure 4.13

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



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, 63% of these "other language" adults in the employed labour force are in skill shortage v.s. 46% of their English-speaking peers.

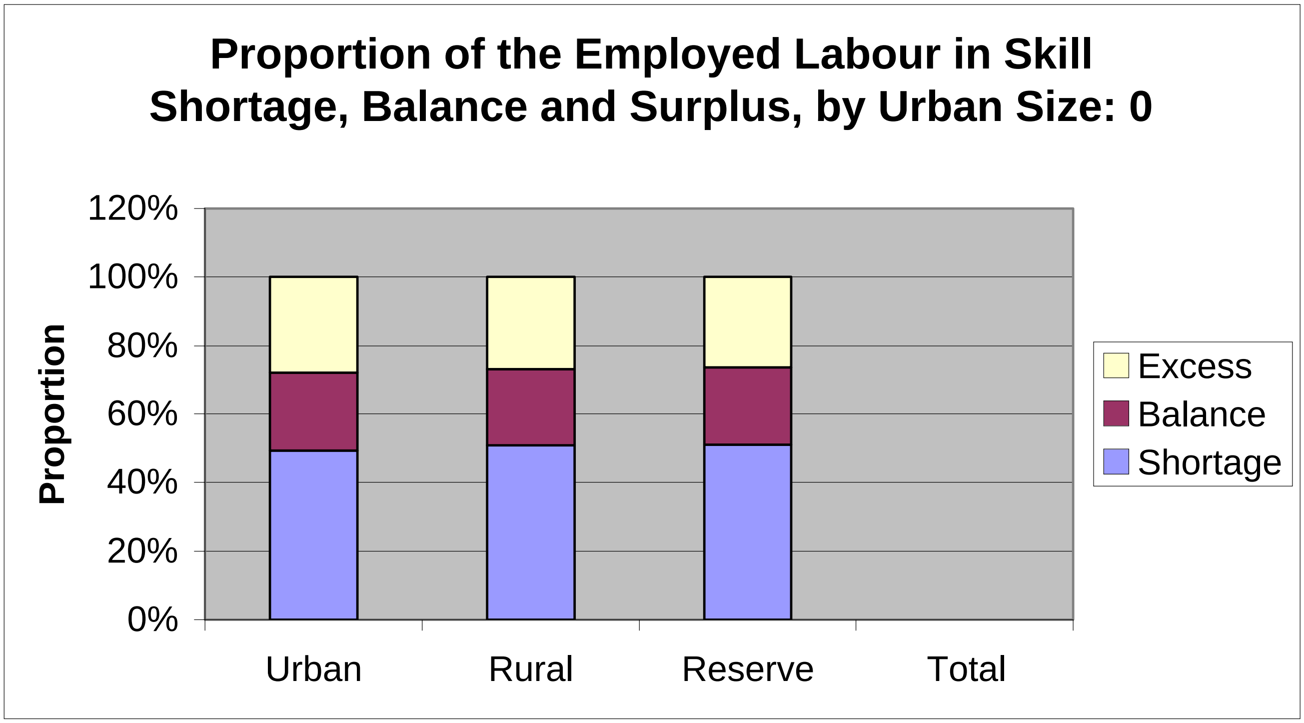
This finding is to be expected. Analysis of data from the International Survey of Reading Skills (ISRS) reveals that non-official language immigrants possess much lower oral language fluency in English or French, and prose literacy skill levels, than their non-immigrant peers (DataAngel, 2009).

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

Urban density

Figure 4.14

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



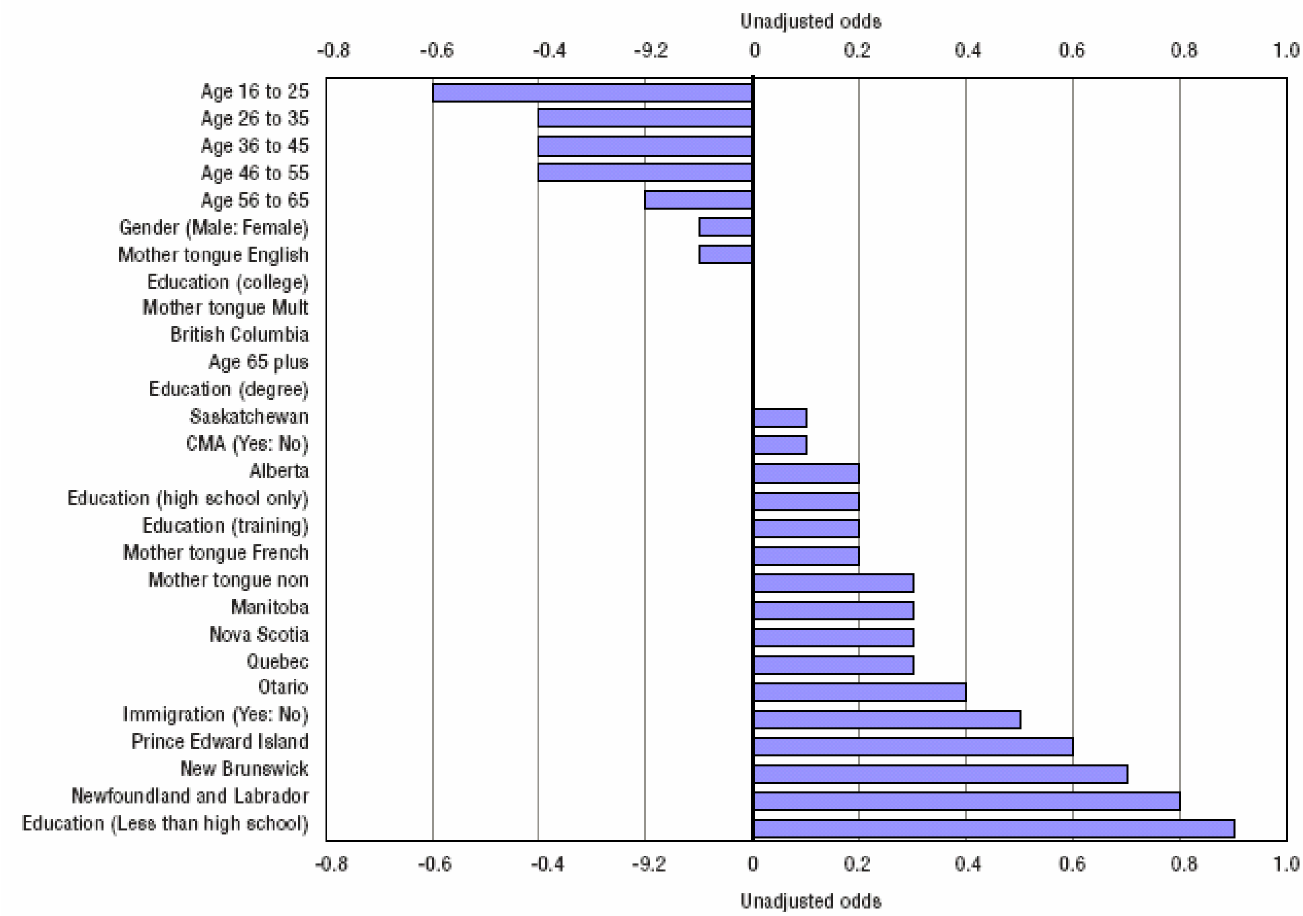
Source: Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

The figure reveals that a large proportion, 49%, of employed urban adults in Canada are in skill shortage. The proportions in rural areas (51%) 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 4.15 provides estimates of the relative risks faced by different groups of adults in Canada compared to a reference group of university-educated seniors living in British Columbia who have multiple mother tongues.

Figure 4.15

Log odds of being in literacy skill shortage, selected groups, Canada, 2006



Groups are sorted by relative risk.

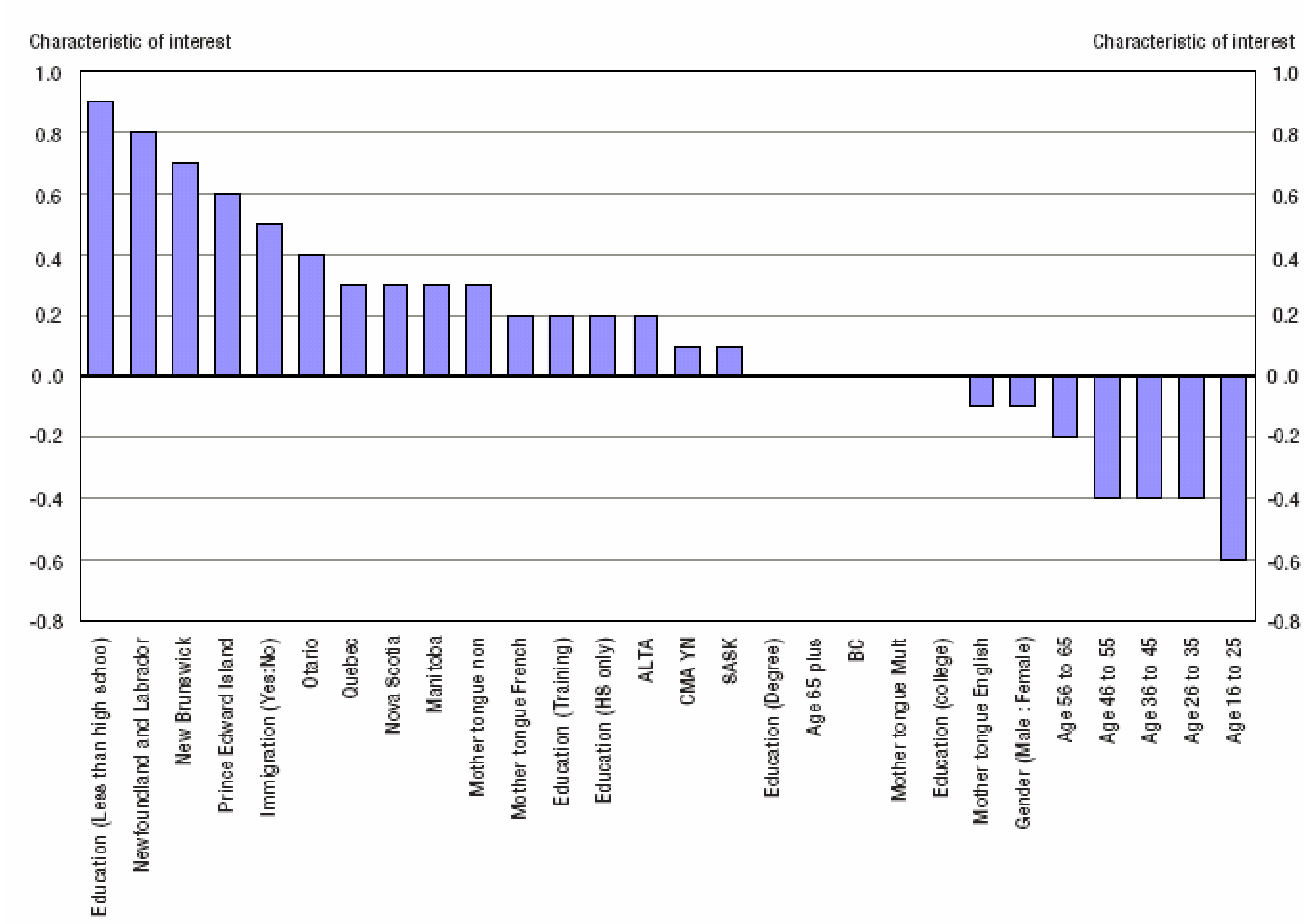
Source: Projections derived using IALSS 2003 the 2006 Census of Population and HRSDC's ES Profiles.

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. University-educated workers aged 65 and over with multiple mother tongues residing in British Columbia are less likely to be in shortage than their peers in other jurisdictions.

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 4.16 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



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 all other jurisdictions face higher levels of risk than their British Columbia 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. Expressed as a percentage of total employment in the occupation literacy skill shortages range from a high of 84% to a low of 27%.

- Literacy skill deficits effect particular population sub-groups more than others. High school drop-outs, immigrants and adults with mother tongues other than English or French face the highest risks of being in shortage.

Chapter 5: Overcoming literacy skill shortages in Canada

This chapter reflects upon the measures that would be required to overcome Canada's literacy skill shortages through remedial education. More specifically this chapter profiles the learning needs of different groups of workers.[1]

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 2005 International Survey of Reading Skills (ISRS) study.

The chapter extends and refines a segmentation analysis of the Canadian literacy market based on the 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:

[1] As initially written the chapter also presented estimates of the cost of providing a "best practice" instructional response designed to raise literacy skill to the required level, expected increases in earnings that would be precipitated and first order approximations of the implied return on investment that would result. These analyses reveal large differences among occupations in the aggregate and average cost per worker of remediation, differences that reflect differences in the average number of points workers in shortage are from the level demanded by their jobs and where these points are distributed along the proficiency scale. These cost benefit analyses have been included in a series of provincial level analyses. See for example Understanding the Literacy Market in Ontario: A Segmentation Analysis (DataAngel, 2009).

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 each being divided into two sub-classes, depending upon whether they were immigrants or not, to reflect differences in learning needs and motivation (DataAngel, 2009). Analysis of the ISRS oral language fluency data by one of the authors suggests that a large proportion of immigrants in literacy skill shortage also have weak language skills.

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. These classes were excluded from the initial market segmentation analyses because it restricted itself to individuals classified at Levels 1 and 2. Class E and F are of policy interest because of the impact that literacy skill shortages might have on the ability of Canadian forms to compete in the global knowledge economy.

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 analysis undertaken by DataAngel extends the initial analysis in four ways.

First, rather than estimating the number of points to prose literacy Level 3 the analysis provides estimates of the number of points of raising workers to the lower threshold of the level of literacy associated with satisfactory job performance in the ES profile for their occupation. The size of the total gap was estimated for each individual and then apportioned to where along the skill continuum the gains would have to be realized. This latter refinement is an important one as the cost per point of remedial instruction varies by a factor of 10 depending on the market segment.

Second, the analysis required the development of “best practice” program responses for moving adults from Levels 3 to 4 and Level 4 to 5. In the end experts advised that the type of embedded learning recommended for market segment D was the most appropriate for segments E and F.

Finally, the analysis provides estimates of the cost of remedial instruction, estimates of the potential earnings benefits and implied rates of return on investment by industry and occupation within provinces and territories based on the distribution of the skill shortage over. Because the unit costs of providing remedial instruction vary so much by market segment and the individual depth of shortage investment decisions based on absolute numbers of potential learners will be sub-optimal. The cost/benefit analyses were developed to provide a means to allocate investment more efficiently to the segments and occupations that would yield the highest returns. Unfortunately, these analyses were dropped from the current report at the request of the client.

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, Canada, 2006

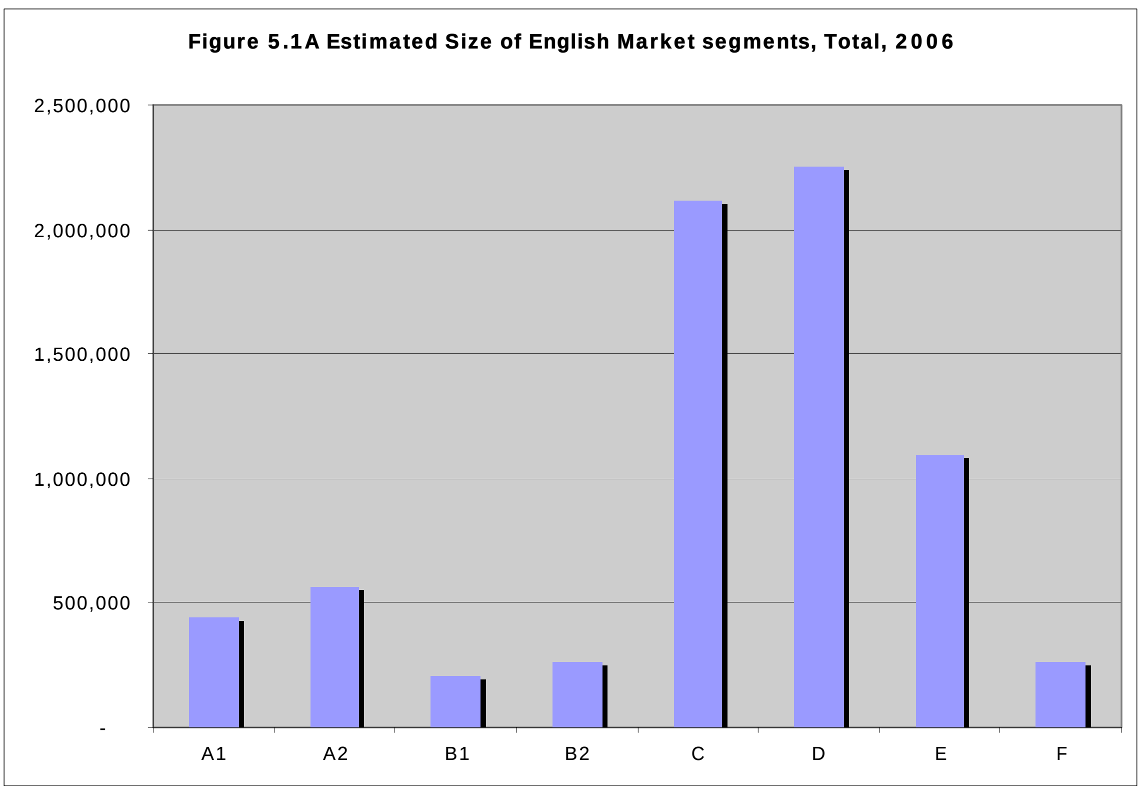
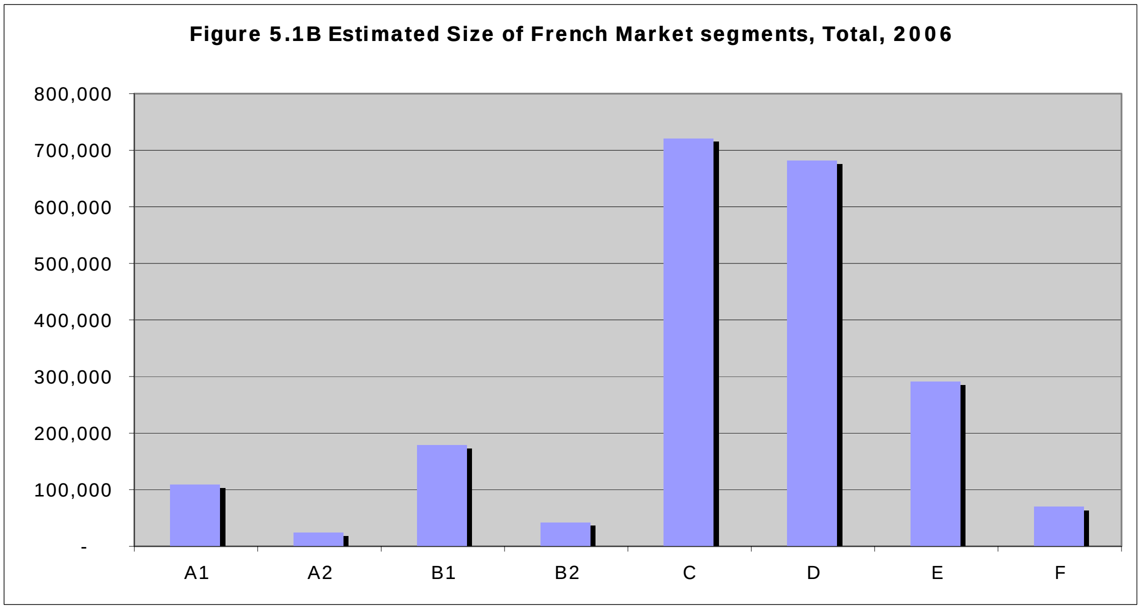


Figure 5.1B

Estimated size of French market segments, Canada, 2006



The figure reveals several important facts, including that:

- The total literacy market in Canada, as defined by the demand for literacy skill generated by the labour market, includes 9,308,600 potential learners who are in literacy shortage.
- 7,192,200 potential learners, or 77% of the literacy market in Canada are in English segments.
- 2,116,400 potential learners, or 23% of the literacy market in Canada are in French segments.
- The English literacy market in Canada is distributed over 8 market segments as shown below:

Language and market segment	Number of potential learners	**Proportion of literacy shortage by market segment**
English		
Latent A1	440,450	6%
Latent A2	565,400	8%
Latent B1	206,350	3%
Latent B2	262,050	4%
Latent C	2,112,850	29%
Latent D	2,253,000	31%
Latent E	1,092,100	15%
Latent F	260,000	4%
Total potential English learners	7,192,200	100%

- 50% of workers in English literacy skill shortage in Canada are classified in literacy market segments D, E and F. 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, only 50% of adults in English literacy skill shortage in Canada have discernible weakness in their decoding and comprehension skills – the traditional target of literacy programs in Canada.

- 12% of the English literacy market in Canada is classified in market segments A2 and B2, the two classes dominated by immigrant women.

The French literacy market in Canada is also distributed over 8 market segments as shown below:

Latent Class	Number of potential learners	**Proportion of literacy shortage by market segment**
French		
Latent A1	108,600	5%
Latent A2	24,750	1%
Latent B1	177,300	8%
Latent B2	41,550	2%
Latent C	721,800	34%
Latent D	680,450	32%
Latent E	291,600	14%
Latent F	70,350	3%
Total potential learners in French	2,116,400	100%
Total learners both languages	9,308,600	

- 49% of workers in French literacy skill shortage in Canada 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.

- 51% of workers in French literacy skill shortage in Canada have discernible weakness in their decoding and comprehension skill.

- Only 3% of the French literacy market in Canada is classified in market segments A2 and B2, the two classes dominated by immigrant women. This proportion is 9% smaller than in the English literacy market in large measure because a much larger proportion of these immigrants have French as a mother tongue.

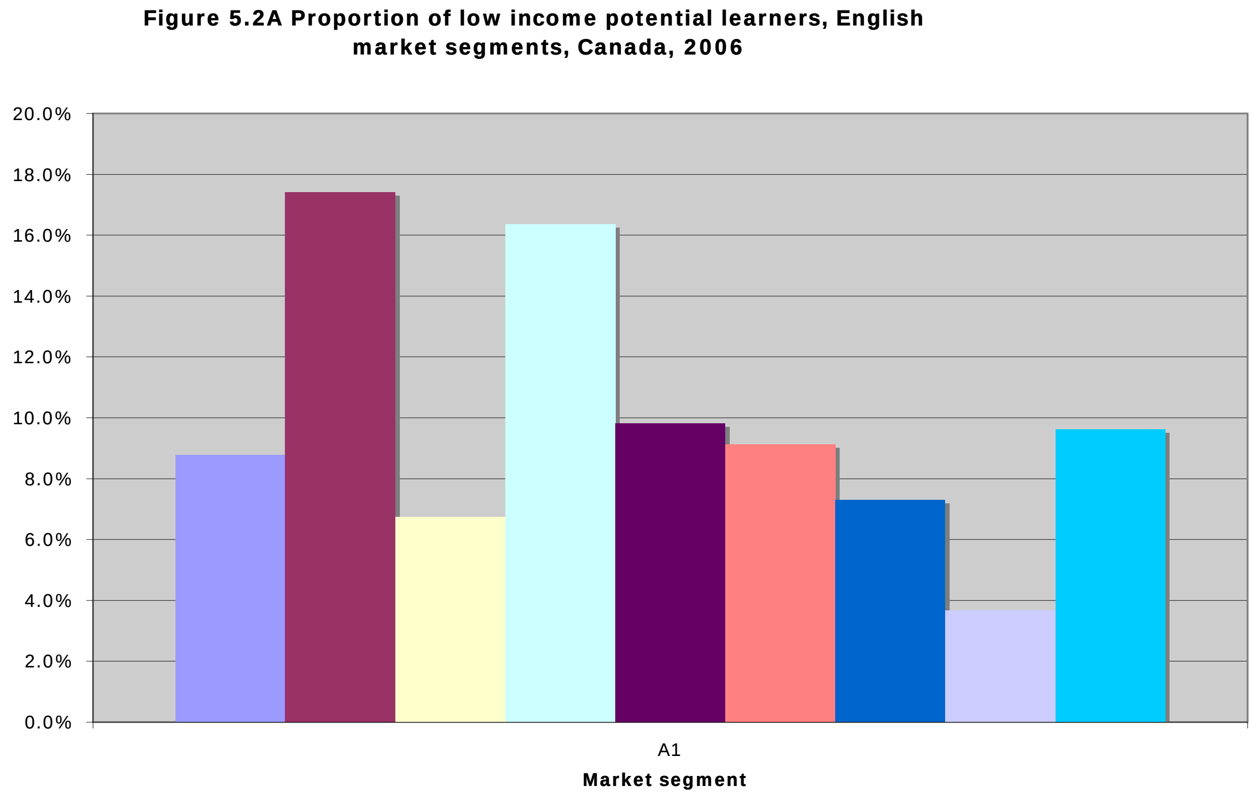
Ability to workers to self-finance required level of remedial instruction

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 5.2 identifies the proportions of individuals in literacy shortage who have incomes below Statistics Canada’s low income cutoff by English market segment in Canada.

Figure 5.2A

Proportion of adults in skill shortage by income status below low income cut-off by English market segment, Canada, 2006 Error! Bookmark not defined.



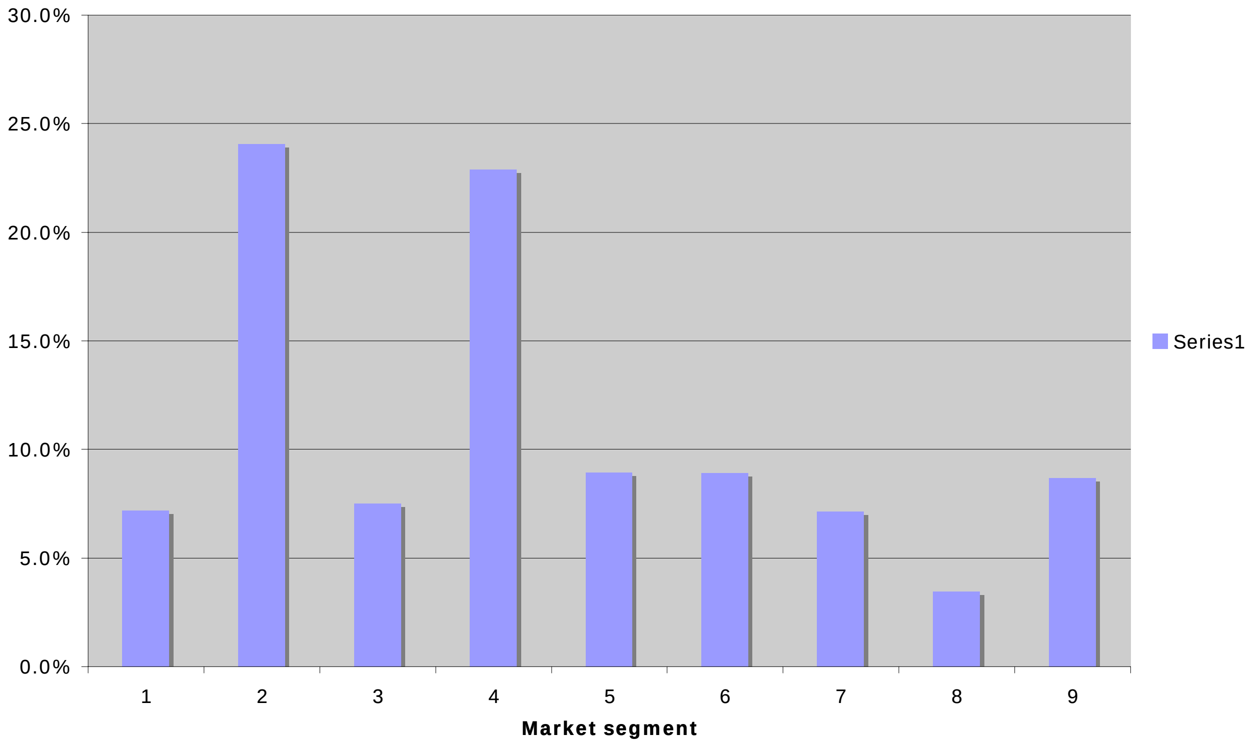
The figure reveals that:

- Over all English market segments in Canada in literacy skill shortage 9.6% have incomes below Statistics Canada's low income cut-offs, a low enough proportion to suggest that government finance may not be needed to precipitate high enough levels of participation and investment.

- However, the proportion of low-income adults in Canada varies considerably by English market segment, from a high of 17.4% for A2 and 18% for B2 – the two segments dominated by immigrants) to a low of 3.7% (F).

Figure 5.2B plots the proportion of low income learners in each French market segment in Canada.

Figure 5.2B proportion of low income for adults in skill shortage, French market segments, Canada, 2006



The figure reveals that:

- Over all French market segments in Canada in literacy skill shortage 8.7% have incomes below Statistics Canada's low income cut-offs, a low enough proportion to suggest that government finance may not be needed to precipitate high enough levels of participation and investment.
- However, the proportion of low-income adults in Canada varies considerably by French market segment, from a high of 24.1% for A2 and 16.4% for B2 – the two segments dominated by immigrants- to a low of 3.5% (F).

Two recent reports have explored the learning needs of adults in each of the market segments - CCL's **Reading the Future: Planning for Canada's Future Literacy Needs** (CCL, 2009) and DataAngel's **Addressing Canada's Literacy Challenge: A Cost/benefit Analysis** (DataAngel, 2009). Both analyses documented cognitive and demographic differences among market segments that implied a need for a differentiated range of instructional responses in terms of program content, duration, instructional approach, instructional mode and venue. These analyses were not undertaken to specify specific instructional approaches. Such decisions are best left up to front line workers who can adapt their program designs to the idiosyncratic characteristics and learning needs of their participants. Rather the goal of these analyses was to derive unit costs for each market segment that would be sufficient, on average, to eliminate their literacy skill shortage. The resulting data provided a means to compute aggregate costs against which estimated benefits could be compared. This section of the report highlights some key characteristics of each market segment that carry implications for program design and funding levels.

The first, and most important aspect is the relationship of literacy skill to language proficiency. The following tables, based on the English language assessments of the ISRS survey, strongly suggest that adults with Level 1 and 2 literacy skills whose mother tongue is not English score more poorly on each of the reading components than those for whom English is their mother tongue.

Table 5.3A. The proportion of respondents who answered the component tests in English by Native Language and proportion correct on the Vocabulary Knowledge (PPVT) component

Vocabulary		**Native Speaker of**	
		English	Other
		%	
Component Proportion Correct	Less than .6	0.6	21.1
	.6 to .8	4.9	26.5
	Greater than .8	94.4	52.5

Table 5.3B The proportion of respondents who answered the component tests in English by Native Language and proportion correct on the Real Word Recognition (TOWRE A) component

Real Word Recogniton		**Native Speaker of**	
		English	Other
		%	
Component Proportion Correct	Less than .3	5.9	17.4
	.3 to .6	12.4	27.8
	.6 to .8	42.8	37.1
	Greater than .8	38.8	17.7

Table 5.3C. The proportion of respondents who answered the component tests in English by Native Language and proportion correct on the Pseudo Word Recognition (TOWRE BA) component

Pseudo Word Recognition		**Native Speaker of**	
		English	Other
		%	
Component Proportion Correct	Less than .6	2	15.3
	.6 to .8	11.8	24.3
	Greater than .8	86.2	60.4

Table 5.3D The proportion of respondents who answered the component tests in English by Native Language and proportion correct on the Spelling component.

Spelling

Spelling		Native Speaker of	
		English	Other
		%	
Component Proportion Correct	Less than .3	1	15.6
	.3 to .6	3	20.3
	.6 to .8	8.6	21.1
	Greater than .8	87.4	43

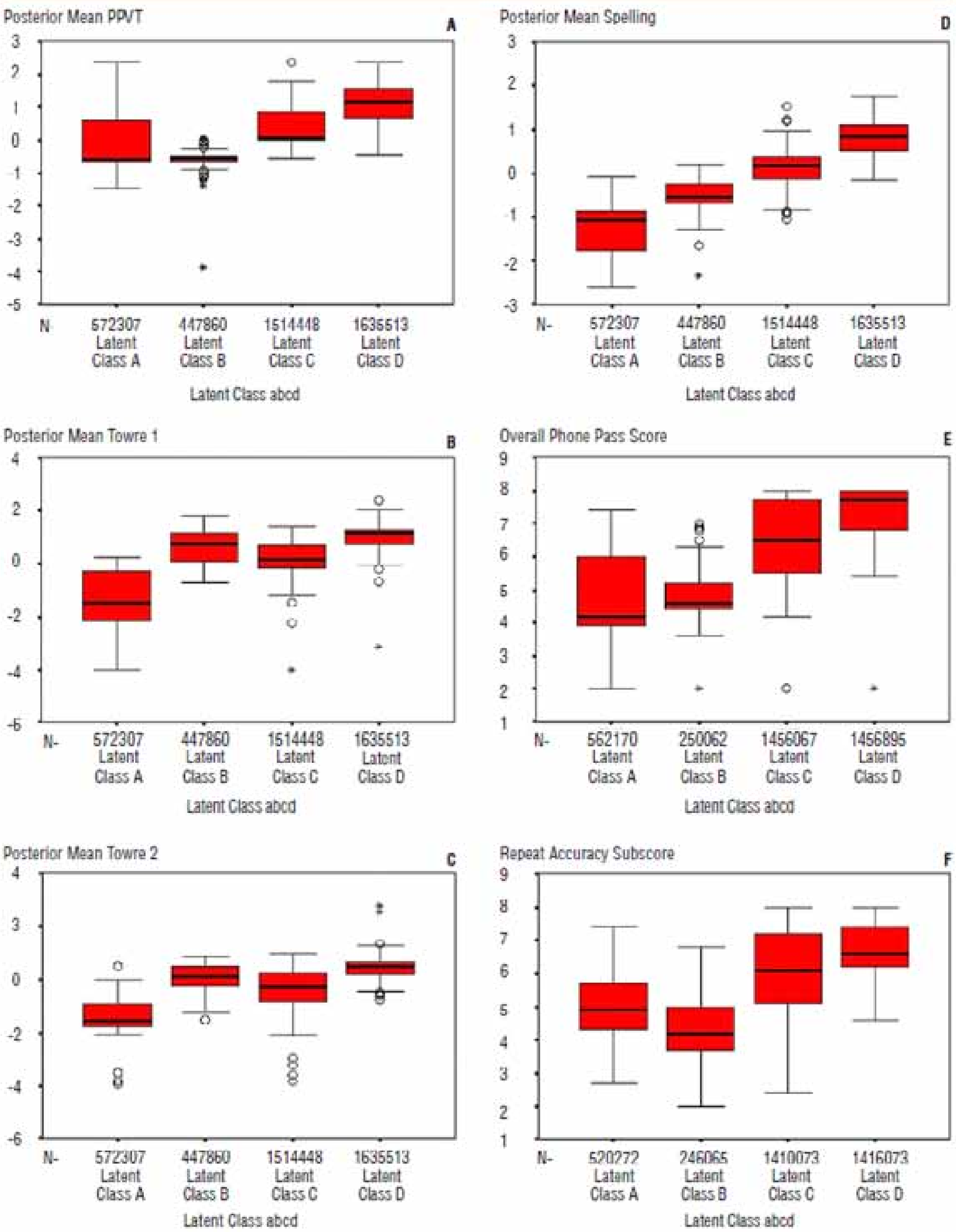
Table 5.3E The proportion of respondents who answered the component tests in English by Native Language and proportion correct on the Digit Span component.

Digit Span		Native Speaker of	
		English	Other
		%	
Component Proportion Correct	Less than .3	1	4.6
	.3 to .6	72.5	84.3
	.6 to .8	26.3	11.1
	Greater than .8	0.3	0

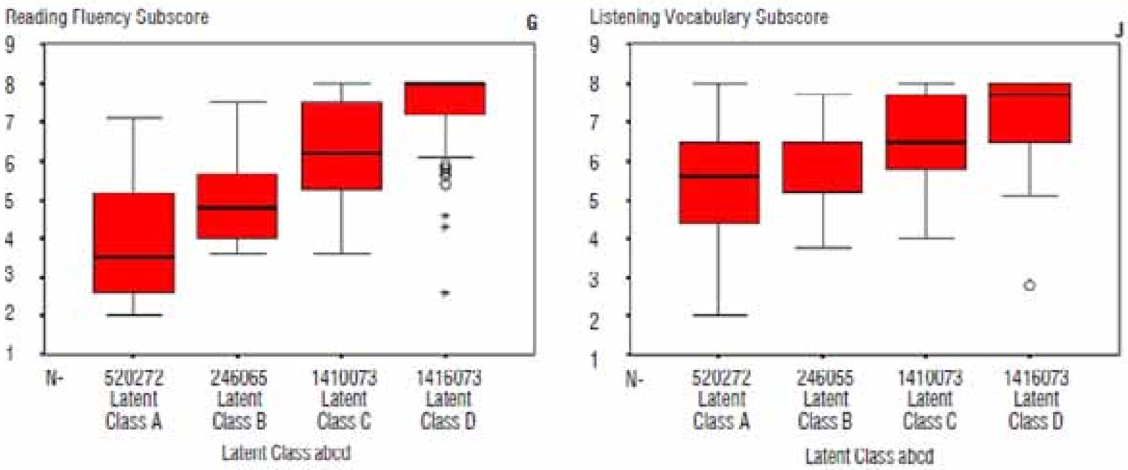
This finding suggests that this group of non-native speakers have both weak oral language fluency and reading literacy skills in English.

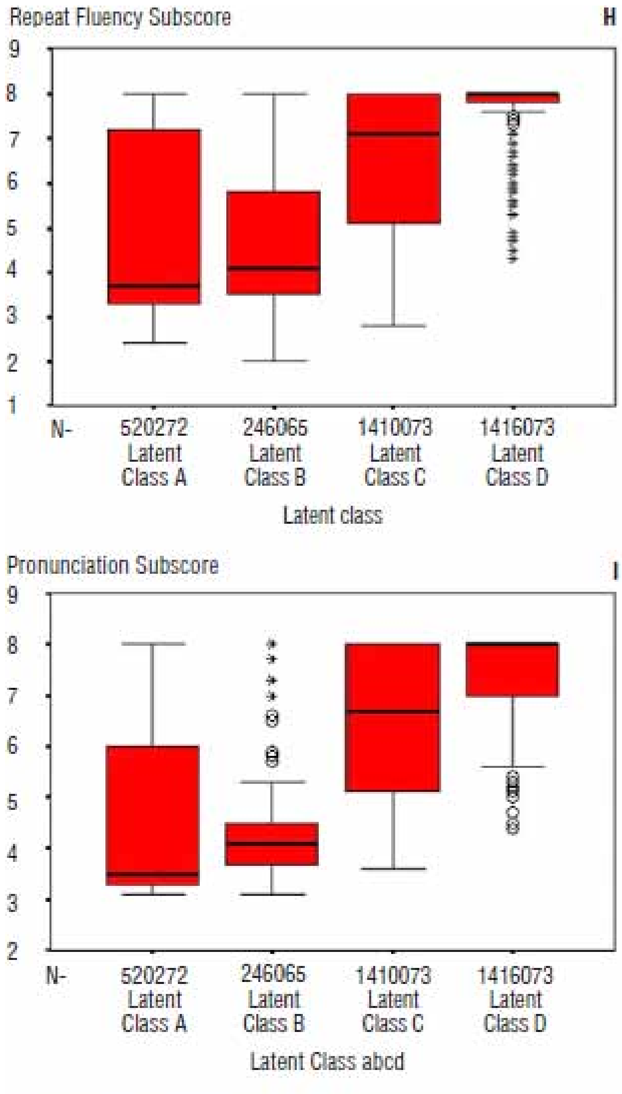
This hypothesis is born out by the following series of charts that plot the distribution of performance on the reading component measures for the four basic market segments. The relatively poor performance of latent classes A and B – the classes containing high proportions of immigrant women - confirms that they have relatively weak oral fluency.

L Box-whisker Plots of Component Scores by Latent Class, Canada



L Box-whisker Plots of Component Scores by Latent Class, Canada





Source: ISRS, 2005.

This finding carries important implications for policy. First, the efficiency and effectiveness of literacy instruction will be impaired for these groups unless and until the weakness in oral fluency is remedied. Second, the provision of instruction to improve oral fluency may itself not fully eliminate the literacy skill shortage possessed by many adults whose mother tongues are neither English nor French. Figure 4.16 confirms that these adults face much higher adjusted likelihoods of being in skill shortage, a troubling result given their relative importance to net labour force growth over the coming decade.

The second aspect of literacy skill shortages that carry implications for program design and public policy has to do with learner characteristics. The bulk of the analysis in this volume is focused on the fit between the labour market –induced demand for literacy skill and the supply of occupationally-experienced workers. By definition those workers in literacy skill shortage are best reached by work-place-based programs. The unemployed and those who haven't worked in the past 5 years are best reached through community-based programs. The matter at hand is the degree to which the current structure of programs is suited to the implied needs of these three groups. The following analysis explores this issue for the English market segments. The ISRS does not support a parallel analysis for French market segments .

English market segment D:

Those with English as a mother tongue in this group have average oral language fluency scores of 72.6 out of 80, the highest skill level. Thus they can speak and understand effortlessly at native speaker speeds, and can contribute readily to a native- paced discussion at length, maintaining the colloquial flow. Their speech is completely fluent and intelligible and they have consistent mastery of complex language structures. Even those with non-English mother tongues in this class have average oral language fluency scores of 64.2, the second highest skill level

53% of the group are employed so could be reached by workplace-based programs. The % balance would have to be reached through community –based programs.

Only 56% of this group have children in the home, a fact that would limit the reach of family literacy programs.

57% exhibit very poor attitudes towards computers. These negative attitudes will interfere with the efficiency and effectiveness of instruction.

English market segment C:

Those with English as a mother tongue in this group have an oral language fluency score of 63.1 meaning that they can easily handle a wide variety of discourse and speaking styles, and can contribute to a native-paced discussion. Their speech is fluent, smooth and intelligible; they control appropriate language structure for speaking about complex material. Even those with non-English mother tongues in this class have average oral language fluency scores of 58.1, the third highest skill level.

39% of the English mother tongue group are employed so reaching them will require community-based programs.

Only 17% of non-English mother tongue immigrants in this segment are employed. Thus, workplace-based programs would miss the vast majority of these learners.

56% of this group have no children in the home, a fact that would limit the reach of family literacy programs.

34% of English mother tongue and 48% other mother tongue adults in segment C have poor attitudes towards computers. These negative attitudes will interfere with the efficiency and effectiveness of instruction.

English market segment B

Those with English mother tongues in this segment (B1) have average oral fluency scores of 50. This implies that they can handle many utterances using a variety of words and structures, and can follow and sometimes participate in a native-paced conversation. Pronunciation is generally intelligible; they can express some composite information on familiar topics to a cooperative listener. This level of oral fluency is likely to impede the efficiency and effectiveness of instruction, particularly in a group setting.

This group has a very low probability of being employed and are overwhelmingly negative about computers.

93% of the group have children in the home, a fact that suggests that family literacy is ideally suited to their needs.

Those with non-English mother tongues (B2) have oral fluency scores of 48.4, the same level as their English mother tongue peers.

73% are employed so workplace –based programs will reach most of them.

English segment A

Those with English as a mother tongue in this segment (A1) have oral fluency scores of 58.3.the same level as those in English segment B.

32% of this group are employed, a fact that suggests a need for community-based programs.

70% of this group have children in the home, a fact that makes them an ideal target for family literacy programs.

Non-English mother tongue immigrant adults (A2) have lower average fluency scores of 40.7. This places them in a lower level. They can only handle short utterances using common words and simple structures, but has difficulty following a native-paced conversation. Pronunciation may sometimes not be intelligible; they speak slowly and pause, but can convey basic information to a cooperative listener. This level of oral fluency will only support instruction in small groups or at the individual level.

53% of these adults are employed, a fact that suggests that work-place-based programs would miss almost half of the group.

Viewed collectively these findings suggest that work-place-based solutions to the literacy shortages identified in this volume would reach some, but not all, of those with low levels of literacy. For some market segments the proportions of employed workers is quite low, a fact that suggests a balanced approach to delivery is needed. Nevertheless, employers can only be expected to help eliminate literacy skill shortages of their workers, a fact that justifies the approach taken in this report.

Chapter 6: Summary and conclusions

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

Several important conclusions may be drawn from this evidence.

The labour market demand for literacy skill in Canada is high and projected to grow rapidly over the coming decade. Recent shifts in the distribution of employment by occupation have served to increase the level of literacy skill demand at a more rapid rate than anticipated.

The supply of literacy skill in Canada 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 Canadian economy appears to be relatively inefficient in the sense that it does not make full use of the available supply of literacy skill. The Canadian economy uses only 66% of the aggregate supply available in the province. Aggregate utilization rates vary significantly by jurisdiction from a high of 71% in Alberta to a low of 53% in Newfoundland and Labrador. In theory, jurisdictions could increase their GDP levels by increasing their aggregate utilization rates. This would involve adopting measures to increase the demand for literacy skill.

At the Canada level current employment demands 101% of the aggregate literacy skill possessed by employed workers. Thus, the level of GDP could be increased if occupationally-experienced workers could be recruited or trained to eliminate this aggregate shortage. The aggregate literacy utilization rate of employed workers varies by jurisdiction from a high of 104% in Nova Scotia and New Brunswick to a low of 93% in the Yukon and Northwest Territories. Jurisdictions with literacy surpluses have a huge untapped economic potential and would benefit from policies to increase the level of literacy skill demand in their economies, particularly in jobs that currently demand Level 2 literacy skill. Jurisdictions with aggregate literacy shortages would benefit from policies that serve to increase the available supply of occupationally-experienced workers with the requisite levels of skill. This could be achieved through selective immigration, adult upgrading or inter-jurisdiction migration.

The economic potential of the Canadian economy is also constrained by the fact that an average of 51% of workers have literacy skill levels below those needed to do their jobs well.

Eliminating literacy skill shortages in Canada would be expensive.. Such an investment would, however, generate sufficient additional earnings to yield very high rates of return on investment. 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 annual benefits could be as high as $32.6 billion in increased earnings.

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 Canada 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 in literacy upgrading but almost certainly not rapidly enough to avoid lots of short term economic pain. Faced with large numbers of low-skilled workers Canadian firms will chose to outsource production, will try to reduce labour costs or will simply be unable to compete. So realizing Canada's full economic potential will depend critically on rapid and massive public investment in adult literacy.

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 jurisdictions, 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

	Distribution of employment at complex	**Proficiency level**				
Jurisdiction	**demand**	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, Canada, 2006

	Proficiency level				
	Level 1	Level 2	Level 3	Level 4	Level 5
Occupational skill level	Percentage				
Level A	-	0%	28%	25%	47%
Level B	-	9%	61%	26%	3%
Level C	-	2%	66%	32%	0%
Level D	-	81%	19%	0%	0%
Total employment	**-**	**15%**	**51%**	**24%**	**10%**

Table 2.8

Employed labour force by prose literacy skill demand level, Canada, 2006

		Proficiency level				
		Level 1	Level 2	Level 3	Level 4	Level 5
		Employment				
Level A			716,650	653,950	1,216,500	
Level B		446,800	2,935,150	1,250,900	159,450	
Level C		103,150	3,239,600	1,552,300	9,750	
Level D		1,561,950	367,700			
Total employment		2,111,950	7,259,100	3,457,100	1,385,700	

Table 2.9Proportion of total employment by literacy skill demand level, industries, Canada, 2006

	Essential Skill Needs - Complex					
	Total	Level 1	Level 2	Level 3	Level 4	Level 5
	Percentage					
All Industries	100%	0%	15%	55%	21%	8%
Primary and Secondary Education	100%	0%	6%	16%	19%	59%
Legal Services	100%	0%	0%	18%	40%	41%
Accounting and Tax Preparation	100%	0%	1%	47%	7%	44%
Hospitals	100%	0%	6%	45%	16%	34%
Architectural, Engineering and Design Services	100%	0%	3%	50%	25%	22%
Travelling Services	100%	0%	4%	32%	63%	2%
Publishing Industries	100%	0%	4%	49%	30%	17%
Other Professional Services	100%	0%	2%	50%	34%	14%
Provincial and Territorial Public Administration	100%	0%	3%	48%	35%	13%
Computer System Design Services	100%	0%	1%	44%	52%	3%
Management, Scientific and Technical Services	100%	0%	3%	53%	32%	12%
Computer and Electronic Product Manufacturing	100%	0%	6%	47%	39%	8%
Ambulatory Health Care Services	100%	0%	2%	59%	27%	12%
Information Services and Data Processing Services	100%	0%	6%	49%	42%	3%
Advertising and Related Services	100%	0%	7%	51%	38%	3%
Private Households	100%	0%	25%	16%	59%	0%
Heritage Institutions	100%	0%	18%	47%	18%	17%
Personal and Laundry Services	100%	0%	17%	33%	49%	1%
Social Assistance	100%	0%	3%	65%	31%	2%
Other Schools and Educational Support	100%	0%	2%	71%	22%	6%
Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin	100%	0%	16%	42%	36%	6%
Nursing and Residential Care Facilities	100%	0%	9%	64%	14%	13%
Printing and Related Support Activities	100%	0%	11%	50%	38%	1%
Broadcasting and Telecommunications	100%	0%	2%	72%	20%	6%
Prime Contracting	100%	0%	11%	59%	18%	11%
Machinery Manufacturing	100%	0%	7%	62%	26%	5%
Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets	100%	0%	11%	51%	37%	1%
Insurance Carriers & Related Activities and Funds & Other Financial Vehicles	100%	0%	2%	74%	20%	5%
Religious, Grant-Making, Civic, and Professional and Similar Organizations	100%	0%	9%	63%	22%	6%
Electrical Equipment, Appliance and Component Manufacturing	100%	0%	9%	63%	22%	5%
Wholesale Trade	100%	0%	8%	65%	26%	2%
Petroleum and Coal Products Manufacturing	100%	0%	23%	43%	25%	10%
Securities, Commodity Contracts, and Other Intermediation and Related Activities	100%	0%	1%	80%	14%	4%
Performing Arts, Spectator Sports and Related	100%	0%	9%	73%	8%	11%

Industries						
Transportation Equipment Manufacturing	100%	0%	5%	72%	19%	3%
Management of Enterprises and Other Administrative Services	100%	0%	13%	59%	23%	5%
Chemical Manufacturing	100%	0%	17%	58%	17%	9%
Monetary Authorities - Central Bank & Credit Intermediation and Related Activities	100%	0%	2%	81%	14%	2%
Federal Government Public Administration (including Defence Services)	100%	0%	2%	83%	12%	3%
Fabricated Metal Product Manufacturing	100%	0%	10%	66%	22%	2%
Real Estate	100%	0%	14%	60%	24%	2%
Post-Secondary Education	100%	0%	5%	78%	15%	2%
University Education	100%	0%	4%	81%	13%	2%
Security Services	100%	0%	5%	77%	16%	1%
Retail Trade	100%	0%	25%	39%	34%	2%
Beverage and Tobacco Product Manufacturing	100%	0%	12%	66%	19%	3%
Transportation	100%	0%	4%	82%	12%	1%
Motion Picture and Sound Recording Industries	100%	0%	11%	74%	11%	4%
Miscellaneous Manufacturing	100%	0%	14%	66%	18%	2%
Primary Metal Manufacturing	100%	0%	19%	59%	19%	3%
Repair and Maintenance	100%	0%	12%	72%	16%	1%
Employment Services	100%	0%	21%	57%	18%	4%
Warehousing and Storage	100%	0%	7%	84%	8%	1%
Furniture and Related Product Manufacturing	100%	0%	12%	74%	13%	1%
Non-Metallic Mineral Product Manufacturing	100%	0%	16%	69%	13%	2%
Mining and Oil and Gas Extraction	100%	0%	27%	49%	19%	5%
Paper Manufacturing	100%	0%	26%	52%	18%	3%
Utilities	100%	0%	22%	62%	13%	3%
Business Services	100%	0%	16%	74%	8%	2%
Plastics and Rubber Products Manufacturing	100%	0%	22%	65%	11%	2%
Textile Mills & Textile Product Mills	100%	0%	25%	63%	10%	2%
Wood Product Manufacturing	100%	0%	29%	56%	14%	1%
Clothing Manufacturing & Leather & Allied Product Manufacturing	100%	0%	22%	71%	6%	1%
Waste Management and Remediation Services	100%	0%	31%	57%	9%	3%
Amusement, Gambling and Recreation Industries	100%	0%	31%	58%	10%	1%
Food Manufacturing	100%	0%	33%	56%	9%	2%
Food Services and Drinking Places	100%	0%	25%	71%	4%	0%
Fishing, Hunting and Trapping	100%	0%	23%	75%	2%	0%
Forestry and Logging with support activities	100%	0%	34%	54%	11%	1%
Accommodation Services	100%	0%	48%	45%	6%	1%
Building Services	100%	0%	78%	13%	8%	0%

Table 2.10

Proportion of total employment by literacy skill demand level, occupations, Canada, 2006

	Total	Level 1	Level 2	Level 3	Level 4	Level 5	Average skill demand
Nurse Supervisors and Registered Nurses	100%	0%	0%	0%	4%	96%	4.96
Teachers and Professors	100%	0%	0%	33%	2%	64%	4.31
Professional Occupations in Business and Finance	100%	0%	0%	32%	14%	54%	4.23
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	100%	0%	0%	24%	37%	39%	4.15
Retail Salespersons and Sales Clerks	100%	0%	0%	0%	100%	0%	4.00
Professional Occupations in Natural and Applied Sciences	100%	0%	0%	24%	53%	23%	3.99
Professional Occupations in Art and Culture	100%	0%	0%	44%	24%	33%	3.89
Contractors and Supervisors in Trades and Transportation	100%	0%	0%	21%	79%	0%	3.79
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	100%	0%	0%	45%	33%	22%	3.77
Professional Occupations in Health	100%	0%	0%	**40%**	**47%**	**14%**	3.74
Technical and Related Occupations in Health	100%	0%	0%	38%	53%	9%	3.72
Childcare and Home Support Workers	100%	0%	0%	36%	64%	0%	3.64
Technical Occupations Related to Natural and Applied Sciences	100%	0%	0%	48%	47%	6%	3.58
Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.	100%	0%	0%	48%	48%	4%	3.56
Occupations in Protective Services	100%	0%	0%	51%	47%	2%	3.51
Other Trades N.E.C.	100%	0%	26%	2%	72%	0%	3.46
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers	100%	0%	0%	57%	43%	0%	3.43
Administrative and Regulatory Occupations	100%	0%	0%	70%	23%	8%	3.38
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	100%	0%	15%	44%	41%	0%	3.25
Machinists, Metal Forming, Shaping and Erecting Occupations	100%	0%	0%	76%	24%	0%	3.23
Clerical Occupations	100%	0%	3%	72%	24%	0%	3.21
Assemblers in Manufacturing	100%	0%	0%	86%	14%	0%	3.14
Mechanics	100%	0%	2%	82%	16%	0%	3.14
Technical Occupations in Art, Culture, Recreation and Sport	100%	0%	0%	90%	8%	2%	3.12
Heavy Equipment and Crane Operators Including Drillers	100%	0%	2%	85%	12%	0%	3.10
Secretaries	100%	0%	0%	91%	9%	0%	3.09

Construction Trades	100%	0%	3%	87%	11%	0%	3.08
Sales and Service Supervisors	100%	0%	21%	52%	26%	0%	3.05
Finance and Insurance Administrative Occupations	100%	0%	0%	97%	3%	0%	3.03
Senior Management Occupations	100%	0%	0%	100%	0%	0%	3.00
Other Managers N.E.C.	100%	0%	0%	100%	0%	0%	3.00
Assisting Occupations in Support of Health Services	100%	0%	0%	100%	0%	0%	3.00
Specialist Managers	100%	0%	0%	100%	0%	0%	3.00
Clerical Supervisors	100%	0%	0%	100%	0%	0%	3.00
Transportation Equipment Operators and Related Workers, Excluding Labourers	100%	0%	1%	98%	1%	0%	3.00
Machine Operators in Manufacturing	100%	0%	7%	90%	3%	0%	2.96
Occupations in Food and Beverage Service	100%	0%	16%	84%	0%	0%	2.84
Chefs and Cooks	100%	0%	18%	82%	0%	0%	2.82
Supervisors in Manufacturing	100%	0%	41%	39%	20%	0%	2.79
Managers in Retail Trade, Food and Accommodation Services	100%	0%	28%	72%	0%	0%	2.72
Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	100%	0%	51%	44%	4%	0%	2.53
Sales & Service Occupations N.E.C.	100%	0%	59%	33%	8%	0%	2.49
Trades Helpers, Construction, and Transportation Labourers and Related Occupations	100%	0%	52%	48%	0%	0%	2.48
Occupations Unique to Agriculture Excluding Labourers	100%	0%	64%	33%	3%	0%	2.39
Labourers in Processing, Manufacturing and Utilities	100%	0%	100%	0%	0%	0%	2.00
Cashiers	100%	0%	100%	0%	0%	0%	2.00

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	-2545	47	
Assemblers in manufacturing	-28	46	46
Labourers in processing, manufacturing and utilities	-12	41	40

Source: COPS, 2009.

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			
			Canada		Nova Scotia	
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**	**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 whol esale 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			
			Canada		Prince Edward Island	
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	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 who lesale 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
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
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			
				CanadaNew		**Brunswick**
NAICS 2002 titles:	NAICS 2002 CODES:	Percent change in employment	May-2006	September-2008	May-2006	September-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
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 l essors 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-2006	Canada September-2008	Quebec May-2006	Quebec September-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
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
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
Management of enterprises and other admin istrative services	5511, 5611-5612, 5619	13.25	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			
			Canada		Ontario	
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**	**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
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
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 who lesale 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
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
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
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
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

			Non-seasonally adjusted, in thousands			
			Canada		Saskatchewan	
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**	**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
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			
			Canada		Alberta	
NAICS 2002 titles:	NAICS 2002 CODES:	Percent change in employment	May-2006	September-2008	May-2006	September-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
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			
			Canada		British Columbia	
NAICS 2002 titles:	NAICS 2002 CODES:	Percent change in employment	May-2006	September-2008	May-2006	September-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 whol esale 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

	Level 1	Level 2	Level 3	Level 4	Level 5	Levels 1 and 2	Levels 4 and 5
Jurisdiction				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

	Level 1	Level 2	Level 3	Level 4	Level 5	Total
Jurisdiction			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, Canada, 2006

Industry	Employed population	Aggregate score	Proportion of total supply
Retail Trade	1,795,850	501,042,150	11.1%
Food Services and Drinking Places	824,650	225,129,450	5.0%
Primary and Secondary Education	704,650	215,622,900	4.8%
Transportation	753,750	207,281,250	4.6%
Wholesale Trade	709,550	200,093,100	4.4%
Hospitals	553,250	161,549,000	3.6%
Trade Contracting	538,250	149,633,500	3.3%
Ambulatory Health Care Services	467,000	136,831,000	3.0%
Prime Contracting	450,950	125,815,050	2.8%
Federal Government Public Administration (including Defence Services)	383,850	115,155,000	2.5%
Social Assistance	339,950	99,945,300	2.2%
Crop Production	376,250	98,953,750	2.2%
Monetary Authorities - Central Bank & Credit Intermediation and Related Activities	328,600	96,279,800	2.1%
Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin	303,650	88,665,800	2.0%
Nursing and Residential Care Facilities	304,600	85,897,200	1.9%
Provincial and Territorial Public Administration	255,400	76,875,400	1.7%
Architectural, Engineering and Design Services	250,900	76,273,600	1.7%
Repair and Maintenance	265,950	73,668,150	1.6%

Computer System Design Services	225,650	69,048,900	1.5%
Transportation Equipment Manufacturing	250,750	67,953,250	1.5%
Mining and Oil and Gas Extraction	222,550	65,429,700	1.4%
Insurance Carriers & Related Activities and Funds & Other Financial Vehicles	222,550	65,207,150	1.4%
Building Services	242,250	64,680,750	1.4%
Religious, Grant-Making, Civic, and Professional and Similar Organizations	217,000	64,015,000	1.4%
Personal and Laundry Services	225,300	61,957,500	1.4%
Real Estate	218,450	61,821,350	1.4%
University Education	201,850	61,766,100	1.4%
Food Manufacturing	229,400	59,873,400	1.3%
Management, Scientific and Technical Services	184,250	55,827,750	1.2%
Amusement, Gambling and Recreation Industries	188,700	54,345,600	1.2%
Broadcasting and Telecommunications	176,450	52,229,200	1.2%
Accommodation Services	186,700	51,902,600	1.1%
Fabricated Metal Product Manufacturing	177,450	48,088,950	1.1%
Legal Services	134,050	40,885,250	0.9%
Accounting and Tax Preparation	134,300	39,887,100	0.9%
Utilities	129,000	37,926,000	0.8%
Wood Product Manufacturing	137,150	36,756,200	0.8%
Securities, Commodity Contracts, and Other Intermediation and Related Activities	120,200	35,819,600	0.8%
Machinery Manufacturing	125,650	34,930,700	0.8%
Other Schools and Educational Support	114,550	34,250,450	0.8%
Business Services	111,350	32,625,550	0.7%
Plastics and Rubber Products Manufacturing	118,650	31,086,300	0.7%
Publishing Industries	101,150	29,839,250	0.7%
Performing Arts, Spectator Sports and Related Industries	99,300	29,094,900	0.6%
Furniture and Related Product Manufacturing	104,600	27,091,400	0.6%
Post-Secondary Education	86,900	26,591,400	0.6%
Security Services	90,600	25,186,800	0.6%
Chemical Manufacturing	88,700	25,013,400	0.6%
Computer and Electronic Product Manufacturing	85,400	24,339,000	0.5%
Other Professional Services	81,800	24,294,600	0.5%
Printing and Related Support Activities	87,000	23,751,000	0.5%
Paper Manufacturing	85,600	23,625,600	0.5%
Management of Enterprises and Other Administrative Services	80,900	23,137,400	0.5%
Primary Metal Manufacturing	81,800	22,413,200	0.5%
Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets	74,100	21,118,500	0.5%
Employment Services	73,000	20,513,000	0.5%
Advertising and Related Services	67,600	19,671,600	0.4%
Miscellaneous Manufacturing	71,850	19,543,200	0.4%
Forestry and Logging with support activities	64,450	18,046,000	0.4%
Private Households	68,100	17,842,200	0.4%
Motion Picture and Sound Recording Industries	60,200	17,759,000	0.4%
Information Services and Data Processing Services	55,950	16,673,100	0.4%
Clothing Manufacturing & Leather & Allied Product Manufacturing	68,350	16,335,650	0.4%
Non-Metallic Mineral Product Manufacturing	58,600	15,880,600	0.4%

Travelling Services	48,200	13,737,000	0.3%
Electrical Equipment, Appliance and Component Manufacturing	46,250	12,580,000	0.3%
Waste Management and Remediation Services	34,800	9,639,600	0.2%
Warehousing and Storage	32,200	8,919,400	0.2%
Textile Mills & Textile Product Mills	33,000	8,448,000	0.2%
Fishing, Hunting and Trapping	33,200	8,432,800	0.2%
Beverage and Tobacco Product Manufacturing	29,700	8,345,700	0.2%
Heritage Institutions	25,400	7,620,000	0.2%
Petroleum and Coal Products Manufacturing	14,250	4,118,250	0.1%
	15,934,200	4,532,627,300	

Table 3.7

The proportion of current employment with skills below prose literacy level 3, by industry, Canada, 2006

Industry	Employment	Percent employment below Level 3	Average prose literacy score	Aggregate literacy supply (in 000)
Clothing Manufacturing & Leather & Allied Product Manufacturing	68,350	66%	239	16,335,650
Fishing, Hunting and Trapping	33,200	59%	254	8,432,800
Textile Mills & Textile Product Mills	33,000	57%	256	8,448,000
Private Households	68,100	56%	262	17,842,200
Furniture and Related Product Manufacturing	104,600	56%	259	27,091,400
Plastics and Rubber Products Manufacturing	118,650	55%	262	31,086,300
Food Manufacturing	229,400	55%	261	59,873,400
Crop Production	376,250	54%	263	98,953,750
Building Services	242,250	53%	267	64,680,750
Wood Product Manufacturing	137,150	52%	268	36,756,200
Fabricated Metal Product Manufacturing	177,450	51%	271	48,088,950
Transportation Equipment Manufacturing	250,750	51%	271	67,953,250
Miscellaneous Manufacturing	71,850	50%	272	19,543,200
Printing and Related Support Activities	87,000	50%	273	23,751,000
Electrical Equipment, Appliance and Component Manufacturing	46,250	50%	272	12,580,000
Non-Metallic Mineral Product Manufacturing	58,600	50%	271	15,880,600
Primary Metal Manufacturing	81,800	49%	274	22,413,200
Food Services and Drinking Places	824,650	49%	273	225,129,450
Transportation	753,750	49%	275	207,281,250
Warehousing and Storage	32,200	48%	277	8,919,400
Personal and Laundry Services	225,300	48%	275	61,957,500
Paper Manufacturing	85,600	48%	276	23,625,600
Waste Management and Remediation Services	34,800	48%	277	9,639,600
Repair and Maintenance	265,950	48%	277	73,668,150
Machinery Manufacturing	125,650	48%	278	34,930,700
Security Services	90,600	47%	278	25,186,800
Accommodation Services	186,700	47%	278	51,902,600

Retail Trade	1,795,850	47%	279	501,042,150
Trade Contracting	538,250	47%	278	149,633,500
Forestry and Logging with support activities	64,450	46%	280	18,046,000
Employment Services	73,000	46%	281	20,513,000
Prime Contracting	450,950	46%	279	125,815,050
Beverage and Tobacco Product Manufacturing	29,700	45%	281	8,345,700
Chemical Manufacturing	88,700	45%	282	25,013,400
Real Estate	218,450	45%	283	61,821,350
Nursing and Residential Care Facilities	304,600	45%	282	85,897,200
Wholesale Trade	709,550	45%	282	200,093,100
Travelling Services	48,200	44%	285	13,737,000
Amusement, Gambling and Recreation Industries	188,700	43%	288	54,345,600
Computer and Electronic Product Manufacturing	85,400	43%	285	24,339,000
Management of Enterprises and Other Administrative Services	80,900	43%	286	23,137,400
Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets	74,100	43%	285	21,118,500
Petroleum and Coal Products Manufacturing	14,250	41%	289	4,118,250
Performing Arts, Spectator Sports and Related Industries	99,300	40%	293	29,094,900
Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin	303,650	40%	292	88,665,800
Advertising and Related Services	67,600	40%	291	19,671,600
Mining and Oil and Gas Extraction	222,550	40%	294	65,429,700
Hospitals	553,250	40%	292	161,549,000
Social Assistance	339,950	40%	294	99,945,300
Motion Picture and Sound Recording Industries	60,200	39%	295	17,759,000
Publishing Industries	101,150	39%	295	29,839,250
Utilities	129,000	39%	294	37,926,000
Insurance Carriers & Related Activities and Funds & Other Financial Vehicles	222,550	39%	293	65,207,150
Religious, Grant-Making, Civic, and Professional and Similar Organizations	217,000	39%	295	64,015,000
Ambulatory Health Care Services	467,000	39%	293	136,831,000
Business Services	111,350	39%	293	32,625,550
Monetary Authorities - Central Bank & Credit Intermediation and Related Activities	328,600	39%	293	96,279,800
Broadcasting and Telecommunications	176,450	38%	296	52,229,200
Other Professional Services	81,800	37%	297	24,294,600
Other Schools and Educational Support	114,550	37%	299	34,250,450
Accounting and Tax Preparation	134,300	37%	297	39,887,100
Information Services and Data Processing Services	55,950	37%	298	16,673,100
Securities, Commodity Contracts, and Other Intermediation and Related Activities	120,200	37%	298	35,819,600
Heritage Institutions	25,400	36%	300	7,620,000
Federal Government Public Administration (including Defence Services)	383,850	36%	300	115,155,000
Provincial and Territorial Public Administration	255,400	36%	301	76,875,400
Architectural, Engineering and Design Services	250,900	34%	304	76,273,600
Management, Scientific and Technical Services	184,250	34%	303	55,827,750
University Education	201,850	33%	306	61,766,100
Computer System Design Services	225,650	33%	306	69,048,900

Primary and Secondary Education	704,650	33%	306	215,622,900
Post-Secondary Education	86,900	33%	306	26,591,400
Legal Services	134,050	33%	305	40,885,250
Total	15,934,200			4,532,627,300

Table 3.8
The supply of literacy skill, selected occupations, Canada, 2006

Occupation	Employment	Aggregate score	Percent of aggregate supply
Clerical Occupations	1,548,950	447,646,550	9.9%
Sales & Service Occupations N.E.C.		316,642,000	7.0%
Teachers and Professors	645,900	203,458,500	4.5%
Retail Salespersons and Sales Clerks	680,100	188,387,700	4.2%
Professional Occupations in Natural and Applied Sciences	585,100	182,551,200	4.0%
Other Managers N.E.C.	502,950	149,376,150	3.3%
Technical Occupations Related to Natural and Applied Sciences	482,550	148,625,400	3.3%
Transportation Equipment Operators and Related Workers, Excluding Labourers	531,850	140,940,250	3.1%
Managers in Retail Trade, Food and Accommodation Services	462,200	132,651,400	2.9%
Professional Occupations in Business and Finance	418,000	125,400,000	2.8%
Specialist Managers	412,800	123,427,200	2.7%
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	362,850	113,572,050	2.5%
Construction Trades	405,200	110,619,600	2.4%
Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.	356,350	107,261,350	2.4%
Mechanics	363,550	101,066,900	2.2%
Administrative and Regulatory Occupations	343,650	100,689,450	2.2%
Trades Helpers, Construction, and Transportation Labourers and Related Occupations	357,700	96,579,000	2.1%
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers	343,400	96,495,400	2.1%
Machine Operators in Manufacturing	360,050	90,012,500	2.0%
Occupations Unique to Agriculture Excluding Labourers	343,150	89,905,300	2.0%
Secretaries	297,200	84,404,800	1.9%
Nurse Supervisors and Registered Nurses	275,550	81,287,250	1.8%
Cashiers	289,900	78,852,800	1.7%
Technical Occupations in Art, Culture, Recreation and Sport	257,150	76,116,400	1.7%
Occupations in Protective Services	266,950	75,813,800	1.7%
Assisting Occupations in Support of Health Services	249,950	70,235,950	1.5%
Occupations in Food and Beverage Service	246,800	68,857,200	1.5%
Childcare and Home Support Workers	242,000	66,308,000	1.5%
Senior Management Occupations	215,500	63,357,000	1.4%
Professional Occupations in Art and Culture	208,950	62,685,000	1.4%
Technical and Related Occupations in Health	214,350	62,590,200	1.4%
Assemblers in Manufacturing	242,900	61,210,800	1.4%
Chefs and Cooks	225,250	59,916,500	1.3%
Labourers in Processing, Manufacturing and Utilities	239,150	59,309,200	1.3%

Machinists, Metal Forming, Shaping and Erecting Occupations	209,450	57,389,300	1.3%
Finance and Insurance Administrative Occupations	196,400	57,348,800	1.3%
Professional Occupations in Health	189,900	56,970,000	1.3%
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	168,750	47,925,000	1.1%
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	130,950	36,796,950	0.8%
Primary Production Labourers	133,500	36,579,000	0.8%
Sales and Service Supervisors	126,100	34,929,700	0.8%
Contractors and Supervisors in Trades and Transportation	121,250	33,343,750	0.7%
Other Trades N.E.C.	123,600	32,877,600	0.7%
Heavy Equipment and Crane Operators Including Drillers	105,000	28,455,000	0.6%
Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	105,350	28,233,800	0.6%
Clerical Supervisors	90,300	26,187,000	0.6%
Supervisors in Manufacturing	74,300	19,318,000	0.4%
	15,934,250	4,532,606,700	100%

Table 3.9
The proportion of current employment with skills below level 3 by occupation, Canada, 2006

Occupation		Percent below Level 3	Average prose literacy score	Aggregate literacy supply
Labourers in Processing, Manufacturing and Utilities	239,150	62%	248	59,309,200
Machine Operators in Manufacturing	360,050	61%	250	90,012,500
Assemblers in Manufacturing	242,900		252	61,210,800
Supervisors in Manufacturing	74,300	56%	260	19,318,000
Occupations Unique to Agriculture Excluding Labourers	343,150	55%	262	89,905,300
Transportation Equipment Operators and Related Workers, Excluding Labourers	531,850	54%	265	140,940,250
Other Trades N.E.C.	123,600	53%	266	32,877,600
Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	105,350	53%	268	28,233,800
Chefs and Cooks	225,250	53%	266	59,916,500
Sales & Service Occupations N.E.C.	1,181,500	53%	268	316,642,000
Cashiers	289,900	51%	272	78,852,800
Trades Helpers, Construction, and Transportation Labourers and Related Occupations	357,700	51%	270	96,579,000
Heavy Equipment and Crane Operators Including Drillers	105,000	50%	271	28,455,000
Primary Production Labourers	133,500	49%	274	36,579,000
Childcare and Home Support Workers	242,000	49%	274	66,308,000
Machinists, Metal Forming, Shaping and Erecting Occupations	209,450	49%	274	57,389,300
Construction Trades	405,200	49%	273	110,619,600
Contractors and Supervisors in Trades and Transportation	121,250	48%	275	33,343,750
Retail Salespersons and Sales Clerks	680,100	47%	277	188,387,700
Sales and Service Supervisors	126,100	47%	277	34,929,700

Mechanics	363,550	47%	278	101,066,900
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	130,950	46%	281	36,796,950
Occupations in Food and Beverage Service	246,800	46%	279	68,857,200
Assisting Occupations in Support of Health Services	249,950	46%	281	70,235,950
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers	343,400	46%	281	96,495,400
Secretaries	297,200	45%	284	84,404,800
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	168,750	44%	284	47,925,000
Occupations in Protective Services	266,950	43%	284	75,813,800
Managers in Retail Trade, Food and Accommodation Services	462,200	43%	287	132,651,400
Clerical Occupations	1,548,950	42%	289	447,646,550
Clerical Supervisors	90,300	41%	290	26,187,000
Finance and Insurance Administrative Occupations	196,400	40%	292	57,348,800
Technical and Related Occupations in Health	214,350	39%	292	62,590,200
Administrative and Regulatory Occupations	343,650	39%	293	100,689,450
Senior Management Occupations	215,500	39%	294	63,357,000
Technical Occupations in Art, Culture, Recreation and Sport	257,150	38%	296	76,116,400
Nurse Supervisors and Registered Nurses	275,550	38%	295	81,287,250
Other Managers N.E.C.	502,950	37%	297	149,376,150
Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.	356,350	36%	301	107,261,350
Professional Occupations in Business and Finance	418,000	36%	300	125,400,000
Professional Occupations in Health	189,900	36%	300	56,970,000
Specialist Managers	412,800	36%	299	123,427,200
Professional Occupations in Art and Culture	208,950	36%	300	62,685,000
Technical Occupations Related to Natural and Applied Sciences	482,550	32%	308	148,625,400
Professional Occupations in Natural and Applied Sciences	585,100	30%	312	182,551,200
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	362,850	30%	313	113,572,050
Teachers and Professors	645,900	28%	315	203,458,500
	15,934,250			4,532,606,700

Occupation	Level 1	Level 2	Level 3	Level 4	Level 5
	Employment by proficiency level				
	Percentage				
Labourers in Processing, Manufacturing and Utilities	38%	24%	20%	11%	5%
Machine Operators in Manufacturing	37%	24%	20%	11%	6%
Assemblers in Manufacturing	36%	24%	20%	12%	6%
Supervisors in Manufacturing	32%	24%	22%	13%	7%
Occupations Unique to Agriculture Excluding Labourers	31%	24%	22%	13%	8%
Transportation Equipment Operators and Related Workers, Excluding Labourers	30%	24%	22%	14%	8%
Other Trades N.E.C.	29%	24%	22%	14%	8%
Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	29%	24%	22%	14%	9%
Chefs and Cooks	30%	23%	22%	14%	8%
Sales & Service Occupations N.E.C.	29%	24%	22%	14%	8%
Cashiers	27%	24%	23%	15%	9%
Trades Helpers, Construction, and Transportation Labourers and Related Occupations	28%	23%	23%	15%	9%
Heavy Equipment and Crane Operators Including Drillers	27%	23%	23%	15%	9%
Primary Production Labourers	26%	23%	23%	16%	10%
Childcare and Home Support Workers	26%	23%	23%	16%	10%
Machinists, Metal Forming, Shaping and Erecting Occupations	26%	23%	23%	16%	10%
Construction Trades	26%	23%	23%	16%	10%
Contractors and Supervisors in Trades and Transportation	25%	23%	24%	16%	10%
Retail Salespersons and Sales Clerks	24%	23%	24%	16%	10%
Sales and Service Supervisors	24%	23%	24%	16%	10%
Mechanics	24%	23%	24%	16%	10%
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	23%	23%	24%	17%	11%
Occupations in Food and Beverage Service	24%	22%	24%	17%	11%
Assisting Occupations in Support of Health Services	23%	23%	24%	17%	11%
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers	23%	23%	24%	17%	11%
Secretaries	22%	23%	24%	17%	12%
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	21%	23%	25%	18%	11%
Occupations in Protective Services	21%	22%	24%	18%	12%
Managers in Retail Trade, Food and Accommodation Services	21%	22%	24%	18%	13%
Clerical Occupations	20%	22%	25%	18%	13%
Clerical Supervisors	19%	22%	25%	19%	13%
Finance and Insurance Administrative Occupations	19%	21%	25%	19%	14%
Technical and Related Occupations in Health	18%	21%	25%	19%	14%
Administrative and Regulatory Occupations	18%	21%	25%	19%	14%
Senior Management Occupations	18%	21%	25%	19%	15%
Technical Occupations in Art, Culture, Recreation and Sport	17%	21%	25%	20%	15%
Nurse Supervisors and Registered Nurses	17%	21%	25%	20%	14%
Other Managers N.E.C.	17%	20%	25%	20%	16%
Paralegals, Social Services Workers and Occupations in Education and	16%	20%	25%	20%	17%

Religion, N.E.C.					
Professional Occupations in Business and Finance	16%	20%	25%	20%	16%
Professional Occupations in Health	16%	20%	25%	20%	16%
Specialist Managers	16%	20%	25%	20%	16%
Professional Occupations in Art and Culture	16%	20%	25%	20%	16%
Technical Occupations Related to Natural and Applied Sciences	13%	19%	25%	22%	19%
Professional Occupations in Natural and Applied Sciences	12%	18%	24%	22%	21%
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	12%	18%	25%	23%	21%
Teachers and Professors	11%	17%	25%	23%	21%

Table 3.10
The proportion of employment with skills above prose literacy level 3, high demand occupations, Canada, 2006

		Proportion of employment by proficiency level				
Occupation	Employment	Level 1	Level 2	Level 3	Level 4	Level 5
Teachers and Professors	645,900	11%	17%	25%	23%	21%
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	362,850	12%	18%	25%	23%	21%
Professional Occupations in Natural and Applied Sciences	585,100	12%	18%	24%	22%	21%
Technical Occupations Related to Natural and Applied Sciences	482,550	13%	19%	25%	22%	19%
Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.	356,350	16%	20%	25%	20%	17%
Specialist Managers	412,800	16%	20%	25%	20%	16%
Professional Occupations in Health	189,900	16%	20%	25%	20%	16%
Professional Occupations in Business and Finance	418,000	16%	20%	25%	20%	16%
Other Managers N.E.C.	502,950	17%	20%	25%	20%	16%
Professional Occupations in Art and Culture	208,950	16%	20%	25%	20%	16%
Technical Occupations in Art, Culture, Recreation and Sport	257,150	17%	21%	25%	20%	15%
Senior Management Occupations	215,500	18%	21%	25%	19%	15%
Nurse Supervisors and Registered Nurses	275,550	17%	21%	25%	20%	14%
Technical and Related Occupations in Health	214,350	18%	21%	25%	19%	14%
Finance and Insurance Administrative Occupations	196,400	19%	21%	25%	19%	14%
Administrative and Regulatory Occupations	343,650	18%	21%	25%	19%	14%
Clerical Supervisors	90,300	19%	22%	25%	19%	13%
Clerical Occupations	1,548,950	20%	22%	25%	18%	13%
Managers in Retail Trade, Food and Accommodation Services	462,200	21%	22%	24%	18%	13%
Occupations in Protective Services	266,950	21%	22%	24%	18%	12%
Secretaries	297,200	22%	23%	24%	17%	12%
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	168,750	21%	23%	25%	18%	11%
Assisting Occupations in Support of Health Services	249,950	23%	23%	24%	17%	11%
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers	343,400	23%	23%	24%	17%	11%
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	130,950	23%	23%	24%	17%	11%
Occupations in Food and Beverage Service	246,800	24%	22%	24%	17%	11%
Contractors and Supervisors in Trades and Transportation	121,250	25%	23%	24%	16%	10%

Primary Production Labourers	133,500	26%	23%	23%	16%	10%
Mechanics	363,550	24%	23%	24%	16%	10%
Machinists, Metal Forming, Shaping and Erecting Occupations	209,450	26%	23%	23%	16%	10%
Retail Salespersons and Sales Clerks	680,100	24%	23%	24%	16%	10%
Sales and Service Supervisors	126,100	24%	23%	24%	16%	10%
Construction Trades	405,200	26%	23%	23%	16%	10%
Childcare and Home Support Workers	242,000	26%	23%	23%	16%	10%
Cashiers	289,900	27%	24%	23%	15%	9%
Heavy Equipment and Crane Operators Including Drillers	105,000	27%	23%	23%	15%	9%
Trades Helpers, Construction, and Transportation Labourers and Related Occupations	357,700	28%	23%	23%	15%	9%
Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	105,350	29%	24%	22%	14%	9%
Sales & Service Occupations N.E.C.	1,181,500	29%	24%	22%	14%	8%
Other Trades N.E.C.	123,600	29%	24%	22%	14%	8%
Chefs and Cooks	225,250	30%	23%	22%	14%	8%
Transportation Equipment Operators and Related Workers, Excluding Labourers	531,850	30%	24%	22%	14%	8%
Occupations Unique to Agriculture Excluding Labourers	343,150	31%	24%	22%	13%	8%
Supervisors in Manufacturing	74,300	32%	24%	22%	13%	7%
Assemblers in Manufacturing	242,900	36%	24%	20%	12%	6%
Machine Operators in Manufacturing	360,050	37%	24%	20%	11%	6%
Labourers in Processing, Manufacturing and Utilities	239,150	38%	24%	20%	11%	5%
Total employment	15,934,250					

Note: Occupations are sorted by proportion at Levels 4 and 5

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 3.15 B to N continued
Projected numbers and proportions of adults aged 16 and over by prose literacy proficiency level, 5 year intervals 2001-2016, by jurisdiction

Newfoundland					
Year	Total	Level 1	Level 2	Level 3	Level 4/5
	Number				
2001	425,000	71,000	118,000	161,000	75,000
2006	432,000	70,000	117,000	166,000	80,000
2011	429,000	68,000	115,000	165,000	81,000
2016	419,000	66,000	113,000	161,000	79,000
2021	408,000	65,000	112,000	156,000	76,000
2026	395,000	63,000	110,000	150,000	72,000
2031	380,000	60,000	107,000	143,000	69,000
	Percent				
2001	100%	17%	28%	38%	18%
2006	100%	16%	27%	38%	19%
2011	100%	16%	27%	38%	19%
2016	100%	16%	27%	38%	19%
2021	100%	16%	27%	38%	19%
2026	100%	16%	28%	38%	18%
2031	100%	16%	28%	38%	18%

Prince Edward Island

Year	Total	Level 1	Level 2	Level 3	Level 4/5
			Number		
2001	107,000	18,000	30,000	40,000	19,000
2006	113,000	18,000	31,000	44,000	21,000
2011	118,000	18,000	31,000	46,000	23,000
2016	121,000	18,000	32,000	47,000	24,000
2021	122,000	18,000	33,000	48,000	24,000
2026	123,000	18,000	33,000	48,000	24,000
2031	123,000	17,000	33,000	48,000	24,000
			Percent		
2001	100%	17%	28%	37%	18%
2006	100%	16%	27%	39%	19%
2011	100%	15%	26%	39%	19%
2016	100%	15%	26%	39%	20%
2021	100%	15%	27%	39%	20%
2026	100%	15%	27%	39%	20%
2031	100%	14%	27%	39%	20%

Nova Scotia

Year	Total	Level 1	Level 2	Level 3	Level 4/5
			Number		
2001	750,000	121,000	204,000	285,000	139,000
2006	773,000	119,000	206,000	297,000	150,000
2011	792,000	117,000	209,000	308,000	157,000
2016	801,000	117,000	212,000	312,000	160,000
2021	803,000	116,000	214,000	313,000	160,000
2026	801,000	115,000	216,000	311,000	159,000
2031	796,000	114,000	217,000	308,000	157,000
			Percent		
2001	100%	16%	27%	38%	19%
2006	100%	15%	27%	38%	19%
2011	100%	15%	26%	39%	20%
2016	100%	15%	26%	39%	20%
2021	100%	14%	27%	39%	20%
2026	100%	14%	27%	39%	20%
2031	100%	14%	27%	39%	20%

New Brunswick

Year	Total	Level 1	Level 2	Level 3	Level 4/5
			Number		
2001	606,000	116,000	180,000	214,000	96,000
2006	624,000	114,000	181,000	225,000	104,000
2011	637,000	112,000	183,000	232,000	109,000
2016	639,000	111,000	184,000	234,000	110,000
2021	637,000	110,000	184,000	233,000	110,000

2026	633,000	108,000	184,000	231,000	109,000
2031	624,000	106,000	183,000	228,000	107,000
			Percent		
2001	100%	19%	30%	35%	16%
2006	100%	18%	29%	36%	17%
2011	100%	18%	29%	36%	17%
2016	100%	17%	29%	37%	17%
2021	100%	17%	29%	37%	17%
2026	100%	17%	29%	36%	17%
2031	100%	17%	29%	37%	17%

Quebec

Year	Total	Level 1	Level 2	Level 3	Level 4/5
			Number		
2001	5,938,000	1,369,000	1,943,000	1,854,000	772,000
2006	6,149,000	1,364,000	1,997,000	1,953,000	835,000
2011	6,368,000	1,360,000	2,064,000	2,056,000	888,000
2016	6,500,000	1,356,000	2,100,000	2,115,000	928,000
2021	6,594,000	1,358,000	2,141,000	2,148,000	947,000
2026	6,674,000	1,355,000	2,176,000	2,179,000	965,000
2031	6,735,000	1,344,000	2,202,000	2,206,000	983,000
			Percent		
2001	100%	23%	33%	31%	13%
2006	100%	22%	32%	32%	14%
2011	100%	21%	32%	32%	14%
2016	100%	21%	32%	33%	14%
2021	100%	21%	32%	33%	14%
2026	100%	20%	33%	33%	14%
2031	100%	20%	33%	33%	15%

Ontario

Year	Total	Level 1	Level 2	Level 3	Level 4/5
			Number		
2001	9,285,000	1,921,000	2,527,000	3,219,000	1,618,000
2006	10,105,000	1,987,000	2,716,000	3,557,000	1,845,000
2011	10,959,000	2,063,000	2,936,000	3,901,000	2,059,000
2016	11,754,000	2,152,000	3,151,000	4,203,000	2,249,000
2021	12,493,000	2,250,000	3,376,000	4,467,000	2,400,000
2026	13,233,000	2,359,000	3,611,000	4,723,000	2,541,000
2031	13,969,000	2,473,000	3,846,000	4,970,000	2,680,000
			Percent		
2001	100%	21%	27%	35%	17%
2006	100%	20%	27%	35%	18%
2011	100%	19%	27%	36%	19%
2016	100%	18%	27%	36%	19%
2021	100%	18%	27%	36%	19%
2026	100%	18%	27%	36%	19%

2031	100%	18%	28%	36%	19%

Manitoba

Year	Total	Level 1	Level 2	Level 3	Level 4/5
Number					
2001	889,000	181,000	245,000	312,000	150,000
2006	916,000	174,000	247,000	330,000	165,000
2011	939,000	168,000	251,000	345,000	175,000
2016	955,000	165,000	254,000	354,000	182,000
2021	963,000	163,000	257,000	358,000	185,000
2026	973,000	162,000	261,000	362,000	188,000
2031	980,000	161,000	265,000	365,000	189,000
Percent					
2001	100%	20%	28%	35%	17%
2006	100%	19%	27%	36%	18%
2011	100%	18%	27%	37%	19%
2016	100%	17%	27%	37%	19%
2021	100%	17%	27%	37%	19%
2026	100%	17%	27%	37%	19%
2031	100%	16%	27%	37%	19%

Saskatchewan

Year	Total	Level 1	Level 2	Level 3	Level 4/5
Number					
2001	770,000	145,000	213,000	280,000	132,000
2006	776,000	136,000	211,000	290,000	140,000
2011	774,000	127,000	209,000	294,000	144,000
2016	766,000	122,000	207,000	293,000	143,000
2021	755,000	119,000	207,000	289,000	140,000
2026	743,000	116,000	206,000	284,000	137,000
2031	733,000	113,000	205,000	280,000	134,000
Percent					
2001	100%	19%	28%	36%	17%
2006	100%	18%	27%	37%	18%
2011	100%	16%	27%	38%	19%
2016	100%	16%	27%	38%	19%
2021	100%	16%	27%	38%	19%
2026	100%	16%	28%	38%	18%
2031	100%	15%	28%	38%	18%

Alberta

Year	Total	Level 1	Level 2	Level 3	Level 4/5
Number					
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%

British Columbia

Year	Total	Level 1	Level 2	Level 3	Level 4/5
			Number		
2001	3,244,000	642,000	885,000	1,151,000	566,000
2006	3,470,000	665,000	939,000	1,239,000	627,000
2011	3,701,000	693,000	1,001,000	1,325,000	681,000
2016	3,918,000	726,000	1,064,000	1,400,000	728,000
2021	4,113,000	762,000	1,127,000	1,460,000	763,000
2026	4,314,000	802,000	1,194,000	1,520,000	797,000
2031	4,514,000	840,000	1,260,000	1,582,000	832,000
			Percent		
2001	100%	20%	27%	35%	17%
2006	100%	19%	27%	36%	18%
2011	100%	19%	27%	36%	18%
2016	100%	19%	27%	36%	19%
2021	100%	19%	27%	35%	19%
2026	100%	19%	28%	35%	18%
2031	100%	19%	28%	35%	18%

Yukon

Year	Total	Level 1	Level 2	Level 3	Level 4/5
			Number		
2001	23,000	3,000	6,000	9,000	5,000
2006	22,000	3,000	6,000	9,000	5,000
2011	22,000	3,000	6,000	9,000	4,000
2016	21,000	3,000	6,000	8,000	4,000
2021	20,000	3,000	6,000	8,000	4,000
2026	20,000	3,000	5,000	8,000	4,000
2031	19,000	3,000	5,000	8,000	4,000
			Percent		
2001	100%	13%	26%	39%	22%
2006	100%	14%	27%	41%	23%

2011	100%	14%	27%	41%	18%
2016	100%	14%	29%	38%	19%
2021	100%	15%	30%	40%	20%
2026	100%	15%	25%	40%	20%
2031	100%	16%	26%	42%	21%

Northwest Territories

Year	Total	Level 1	Level 2	Level 3	Level 4/5
Number					
2001	29,000	4,000	8,000	11,000	6,000
2006	30,000	4,000	8,000	12,000	6,000
2011	31,000	4,000	8,000	12,000	6,000
2016	32,000	4,000	8,000	13,000	6,000
2021	32,000	5,000	9,000	13,000	6,000
2026	32,000	5,000	9,000	13,000	6,000
2031	33,000	5,000	9,000	13,000	6,000
Percent					
2001	100%	14%	28%	38%	21%
2006	100%	13%	27%	40%	20%
2011	100%	13%	26%	39%	19%
2016	100%	13%	25%	41%	19%
2021	100%	16%	28%	41%	19%
2026	100%	16%	28%	41%	19%
2031	100%	15%	27%	39%	18%

Nunavut

Year	Total	Level 1	Level 2	Level 3	Level 4/5
Number					
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%

Table 4.1

Aggregate prose literacy supply and demand at peak level and net surplus, Canada and the jurisdictions, 2006

Jurisdiction	Aggregate prose literacy supply total population (in points)	Aggregate prose literacy demand (employed) (in points)	Net supply (population) (in points)	Literacy utilization rate 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, 2006Error! Bookmark not defined.

Jurisdiction	Aggregate prose literacy supply employed population (in points)	Aggregate prose literacy demand employed population (in points)	Net literacy surplus (deficit) (in points)	Literacy utilization rate 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 4.3A
Literacy demand, literacy supply and number of workers in literacy skill surplus and shortage by literacy proficiency level, all occupations, Canada, 2006

Prose literacy proficiency level	Demand by proficiency level	Supply by proficiency level	Skill surplus(shortage) by proficiency level
Level 1	-	3,577,099	3,577,099
Level 2	2,245,650	3,414,504	1,168,854
Level 3	8,845,900	3,902,290	-4,943,610
Level 4	3,457,100	2,926,717	-530,383
Level 5	1,385,750	2,113,740	727,990
Total	**15,934,350**	**15,934,350**	-

Note: Positive numbers indicate that supply exceeds demand

Table 4.3B
Aggregate demand, supply and literacy skill surplus and literacy skill shortage, peak demand, all occupations, 2006, Canada

	Employment	Demand complex	Available supply	Net supply Difference	Spread aggregate point	Average point spread per worker
Level 1	-	-	-	-	0	
Level 2	2,245,650	505,271,250	599,588,550	94,317,300	33684750	15
Level 3	8,845,900	2,432,622,500	2,512,235,600	79,613,100	238839300	27
Level 4	3,457,100	1,123,557,500	999,101,900	-124,455,600	179769200	52
Level 5	1,385,750	519,656,250	424,039,500	-95,616,750	105317000	76
Total	**15,934,350**	**4,581,107,500**	**4,534,965,550**	-46,141,950	**557,610,250**	35

Note: Positive numbers indicate that supply exceeds demand.

Table 4.4
Proportion of workers below the required literacy skill level, by industry, Canada, 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%
Transportation Equipment Manufacturing	48%
Federal Government Public Administration (including Defence Services)	48%
Utilities	47%
Provincial and Territorial Public Administration	47%
Retail Trade	47%
Miscellaneous Manufacturing	47%
Wood Product Manufacturing	46%
Wholesale Trade	46%
Other Professional Services	46%
Chemical Manufacturing	46%
Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin	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%
Computer System Design Services	43%
Food Services and Drinking Places	43%
Employment Services	42%
Waste Management and Remediation Services	42%
Insurance Carriers & Related Activities and Funds & Other Financial Vehicles	42%
Petroleum and Coal Products Manufacturing	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, Canada, 2006

Industry	Number of workers with shortage
Retail Trade	915,919
Primary and Secondary Education	467,446
Transportation	393,825
Food Services and Drinking Places	376,794
Wholesale Trade	366,862
Hospitals	328,705
Trade Contracting	297,411
Ambulatory Health Care Services	246,602
Prime Contracting	213,275
Federal Government Public Administration (including Defence Services)	192,719
Social Assistance	164,044
Nursing and Residential Care Facilities	162,236
Crop Production	160,604
Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin	151,369
Monetary Authorities - Central Bank & Credit Intermediation and Related Activities	147,009
Transportation Equipment Manufacturing	142,095
Repair and Maintenance	133,882
Provincial and Territorial Public Administration	130,771
Personal and Laundry Services	130,579
Architectural, Engineering and Design Services	128,970
Food Manufacturing	120,243
Computer System Design Services	109,635
Real Estate	108,022
Insurance Carriers & Related Activities and Funds & Other Financial Vehicles	105,594
Religious, Grant-Making, Civic, and Professional and Similar Organizations	100,595
Fabricated Metal Product Manufacturing	98,860
Mining and Oil and Gas Extraction	92,228
Building Services	90,935
Management, Scientific and Technical Services	90,742
Legal Services	87,622
Accounting and Tax Preparation	83,080
Broadcasting and Telecommunications	81,778
University Education	76,578
Amusement, Gambling and Recreation Industries	74,044
Accommodation Services	72,024
Machinery Manufacturing	69,274
Wood Product Manufacturing	68,850
Utilities	67,344
Plastics and Rubber Products Manufacturing	64,556
Furniture and Related Product Manufacturing	60,938
Publishing Industries	55,035
Other Schools and Educational Support	51,880
Securities, Commodity Contracts, and Other Intermediation and Related Activities	51,669

Printing and Related Support Activities	50,423
Computer and Electronic Product Manufacturing	48,005
Security Services	46,753
Performing Arts, Spectator Sports and Related Industries	45,823
Business Services	45,076
Chemical Manufacturing	44,838
Other Professional Services	43,506
Clothing Manufacturing & Leather & Allied Product Manufacturing	43,284
Private Households	42,846
Primary Metal Manufacturing	42,553
Paper Manufacturing	41,942
Management of Enterprises and Other Administrative Services	40,223
Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets	38,164
Miscellaneous Manufacturing	38,013
Employment Services	35,842
Advertising and Related Services	34,511
Post-Secondary Education	33,055
Non-Metallic Mineral Product Manufacturing	30,503
Travelling Services	28,997
Forestry and Logging with support activities	27,791
Information Services and Data Processing Services	27,387
Electrical Equipment, Appliance and Component Manufacturing	26,157
Motion Picture and Sound Recording Industries	25,154
Textile Mills & Textile Product Mills	18,423
Fishing, Hunting and Trapping	18,396
Waste Management and Remediation Services	16,028
Warehousing and Storage	15,923
Beverage and Tobacco Product Manufacturing	14,880
Heritage Institutions	11,603
Petroleum and Coal Products Manufacturing	6,868
	8,115,608

Table 4.6
Proportion of workers below the required literacy skill level, by occupation, Canada, 2006

Occupation	Percentage with shortage
Nurse Supervisors and Registered Nurses	84%
Retail Salespersons and Sales Clerks	73%
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	71%
Contractors and Supervisors in Trades and Transportation	69%
Professional Occupations in Business and Finance	66%
Childcare and Home Support Workers	66%
Other Trades N.E.C.	65%
Assemblers in Manufacturing	64%
Teachers and Professors	62%
Machine Operators in Manufacturing	61%
Technical and Related Occupations in Health	59%
Professional Occupations in Art and Culture	58%
Occupations in Protective Services	58%
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers	57%
Professional Occupations in Natural and Applied Sciences	56%
Machinists, Metal Forming, Shaping and Erecting Occupations	55%
Professional Occupations in Health	55%
Transportation Equipment Operators and Related Workers, Excluding Labourers	55%
Heavy Equipment and Crane Operators Including Drillers	54%
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	53%
Construction Trades	52%
Supervisors in Manufacturing	52%
Mechanics	52%
Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.	51%
Sales and Service Supervisors	50%
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	50%
Chefs and Cooks	50%
Administrative and Regulatory Occupations	49%
Clerical Occupations	48%
Secretaries	47%
Technical Occupations Related to Natural and Applied Sciences	47%
Assisting Occupations in Support of Health Services	47%
Occupations in Food and Beverage Service	44%
Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	42%
Technical Occupations in Art, Culture, Recreation and Sport	42%
Clerical Supervisors	42%
Finance and Insurance Administrative Occupations	42%
Occupations Unique to Agriculture Excluding Labourers	41%
Sales & Service Occupations N.E.C.	41%
Trades Helpers, Construction, and Transportation Labourers and Related Occupations	40%
Senior Management Occupations	40%

Other Managers N.E.C.	38%
Labourers in Processing, Manufacturing and Utilities	38%
Specialist Managers	37%
Managers in Retail Trade, Food and Accommodation Services	37%
Cashiers	27%
Primary Production Labourers	27%

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

Table 4.7
Numbers of workers below the required literacy skill level, by occupation, Canada, 2006

Occupation	Number with shortage
Clerical Occupations	
Retail Salespersons and Sales Clerks	494,061
Sales & Service Occupations N.E.C.	484,222
Teachers and Professors	398,273
Professional Occupations in Natural and Applied Sciences	325,381
Transportation Equipment Operators and Related Workers, Excluding Labourers	291,505
Professional Occupations in Business and Finance	275,143
Nurse Supervisors and Registered Nurses	232,797
Technical Occupations Related to Natural and Applied Sciences	229,187
Machine Operators in Manufacturing	219,349
Construction Trades	211,938
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers	195,471
Other Managers N.E.C.	193,035
Mechanics	187,603
Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.	180,850
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	180,492
Managers in Retail Trade, Food and Accommodation Services	172,302
Administrative and Regulatory Occupations	169,589
Childcare and Home Support Workers	158,860
Assemblers in Manufacturing	155,249
Specialist Managers	154,129
Occupations in Protective Services	153,888
Trades Helpers, Construction, and Transportation Labourers and Related Occupations	143,008
Occupations Unique to Agriculture Excluding Labourers	141,176
Secretaries	141,155
Technical and Related Occupations in Health	126,290
Professional Occupations in Art and Culture	121,823
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	120,101
Assisting Occupations in Support of Health Services	116,617
Machinists, Metal Forming, Shaping and Erecting Occupations	116,086
Chefs and Cooks	111,948
Occupations in Food and Beverage Service	107,960
Technical Occupations in Art, Culture, Recreation and Sport	107,596

Professional Occupations in Health	104,845
Labourers in Processing, Manufacturing and Utilities	91,447
Senior Management Occupations	85,659
Contractors and Supervisors in Trades and Transportation	83,295
Finance and Insurance Administrative Occupations	81,690
Other Trades N.E.C.	80,129
Cashiers	78,918
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	69,368
Sales and Service Supervisors	62,836
Heavy Equipment and Crane Operators Including Drillers	56,498
Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	44,270
Supervisors in Manufacturing	38,490
Clerical Supervisors	37,783
Primary Production Labourers	35,426
Total number of workers in literacy skill shortage	8,113,531

Source: IALSS 2003 and ESP, 2008.

Table 4.8 The number of workers in literacy skill shortage by sector council, Canada, 2006

Sector council	**Workers in literacy shortage**
Apparel Human Resources Council	52,950
Auto Repair Service Council	134,750
Aviation Maintenance Council	80,000
Biotechnology Human Resources Council	46,350
Council for Automotive Human Resources	115,450
Council of Prof Fish Harvesters	28,750
Construction Sector Council	633,750
Cultural Human Resources Council	238,700
Electricity Sector Council	55,350
Food Industry Council	326,350
Mining Industry Human Resources Council	119,250
Motor Carrier Passenger Council	59,450
National Seafood Sector Council	27,500
Petroleum Human Resources Council of	87,850
Plastics Sector Council	65,200
Printing Sector Council	59,100
Steel Trade Empl Congress	33,100
Textiles Human Resources Council	4,100
Tourism Human Resources Sector Council	1,008,350
Trucking Human Resources Council	159,700
Wood Manufacturing Council	206,050
	3,542,050

Table 4.9

The proportion of the employed labour force in skill shortage, balance and surplus by gender, Canada, 2006

	Employed Labour Force		
Gender	Shortage	Balance	Surplus
Male	52%	22%	25%
Female	50%	23%	28%

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, Canada, 2006

	Employed labour force		
Immigration status	Shortage	Balance	Surplus
Immigrant	63%	20%	18%
Non-Immigrant	48%	23%	29%

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, Canada, 2006 Error! Bookmark not defined.

	Employed Labour Force		
Age Group	Shortage	Balance	Surplus
15-24	43%	23%	34%
25-34	48%	23%	29%
35-44	52%	23%	26%
45-54	53%	22%	25%
55-64	58%	21%	21%
65 +	64%	19%	17%
Total	51%	23%	27%

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

Table 4.12
The number and proportion of current employment in skill status by aboriginal status, Canada, 2006

	Shortage	Balance	Excess
Aboriginal status		Percentage	
Aboriginal	47	23	30
Non-Aboriginal	51	23	26

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

Table 4.13

The number and proportion of the employed labour force in skill shortage, balance and surplus by official language, Canada, 2006

Shortage Balance			Excess
Mother tongue Percentage			
English	46%	24%	31%
French	54%	22%	31%
Multiple	53%	22%	26%
Other	63%	20%	21%
Total 51 23			**32**

Table 4.14
The number and proportion of current employment in skill shortage by urban density, Canada, 2006

Shortage Balance			Excess
Urban size Percentage			
Urban	49%	23%	28%
Rural	51%	22%	27%
Reserve	51%	23%	27%

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 , 2006

Group	Unadjusted likelihood of being in literacy skill shortage- Canada
Immigration (Yes:No)	185%
Gender (Male : Female)	86%
Education (Less than high school)	157%
Education (High school only)	96%
Education (Trade certificate, diploma, apprentice)	106%
Education (College)	92%
Education (university degree)	100%
Age_16_25	42%
Age_26_35	52%
Age_36_45	60%
Age_46_55	62%
Age_56_65	79%
Age_65_Plus	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_English	75%
Mother_Tongue_French	105%
Mother_Tongue_Non-ENglis/French	151%
Mother_Tongue_Multiple	100%
Census Metropolitan Area_YN	111%

Table 4.16A
Unadjusted likelihoods of being in prose literacy skill shortage, selected groups, Canada , 2006

	Adjusted likelihoods
Education (LT HS)	190%
Newfoundland	180%
New Brunswick	167%
PEI	159%
Immigration (Yes:No)	154%
Ontario	140%
Quebec	134%
Nova Scotia	133%
Manitoba	130%
Mother_Tongue_Non-English/French	129%
Mother_Tongue_French	120%
Education (Training)	117%
Education (HS only)	116%
Alberta	116%
Census Metropolitan Area_YN	111%
Saskatchewan	108%
Education (Degree)	100%
Age_65_Plus	100%
British olumbia	100%
Mother_Tongue_Multiple	100%
Education (college)	100%
Mother_Tongue_English	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, Canada, 2006

Language and market segment	Number of potential learners Number	Proportion of literacy shortage by market segment Percentage
English		
Latent A1	53,600	5%
Latent A2	98,600	9%
Latent B1	26,400	2%
Latent B2	42,150	4%
Latent C	290,500	27%
Latent D	332,200	31%
Latent E	182,500	17%
Latent F	44,950	4%
Total	1,070,900	

French	-	
Latent A1	-	0%
Latent A2	-	0%
Latent B1	-	0%
Latent B2	300	0%
Latent C	300	35%
Latent D	250	35%
Latent E	-	29%
Latent F		0%
Total	850	
Total both languages	1,071,750	

Table 5.3
Number and proportion of adults in skill shortage by market segment by low income status, Canada, 2006

Language	Market segment	Potential learners with income below Statistics Canada LICO	Potential learners with income above Statistics Canada LICO	Proportion of low income learners
English	A1	35750	407150	8.8%
	A2	86950	499250	17.4%
	B1	12500	185550	6.7%
	B2	37200	227350	16.4%
	C	197000	2007100	9.8%
	D	212750	2329150	9.1%
	E	73400	1005050	7.3%
	F	9100	247650	3.7%
	Total	664650	6908250	9.6%
French	A1	7400	103050	7.2%
	A2	4850	20150	24.1%
	B1	12800	170600	7.5%
	B2	7850	34300	22.9%
	C	62250	696700	8.9%
	D	63550	711700	8.9%
	E	19400	271650	7.1%
	F	2350	67850	3.5%
	Total	180450	2076000	8.7%

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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 VariableCompared 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 64	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 Error! Bookmark not defined.

A comparison of the distribution of average literacy scores by occupation derived from the 2003 IALSS and imputed for the 2006 Census

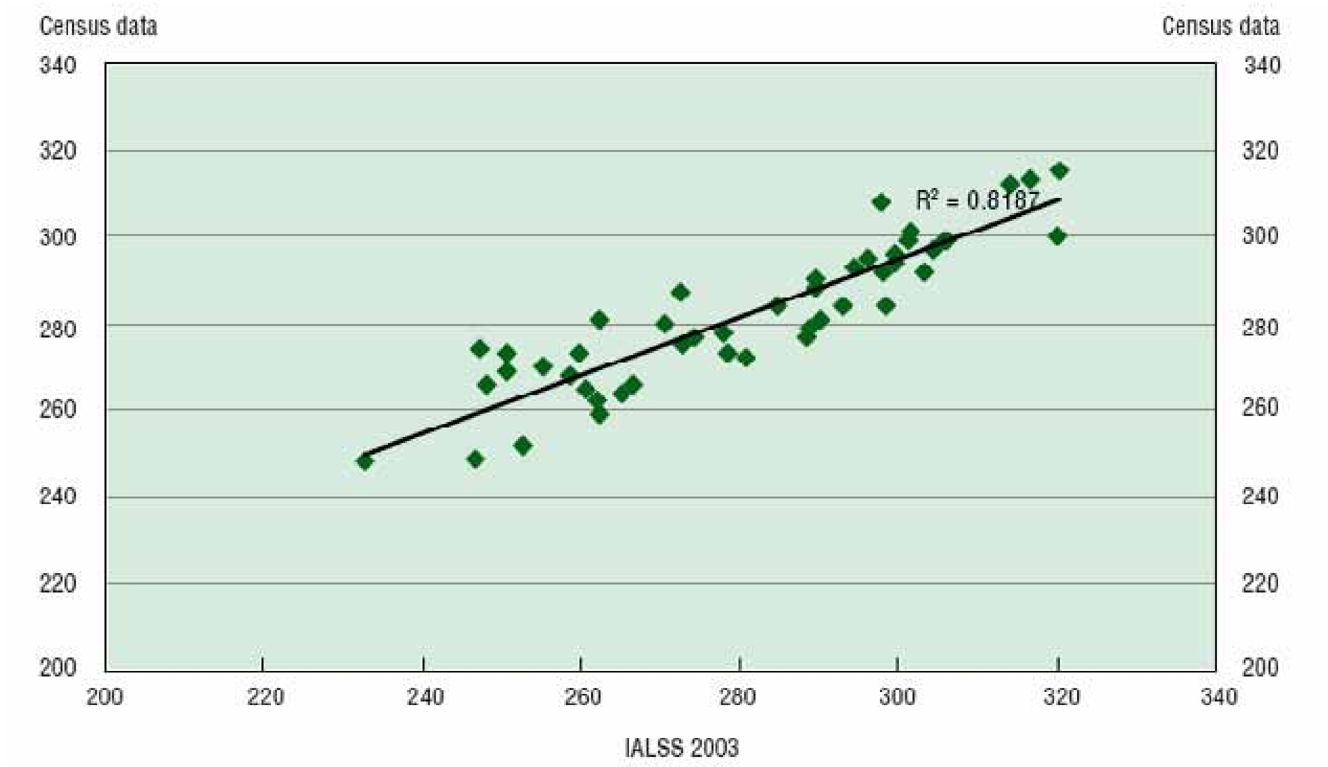
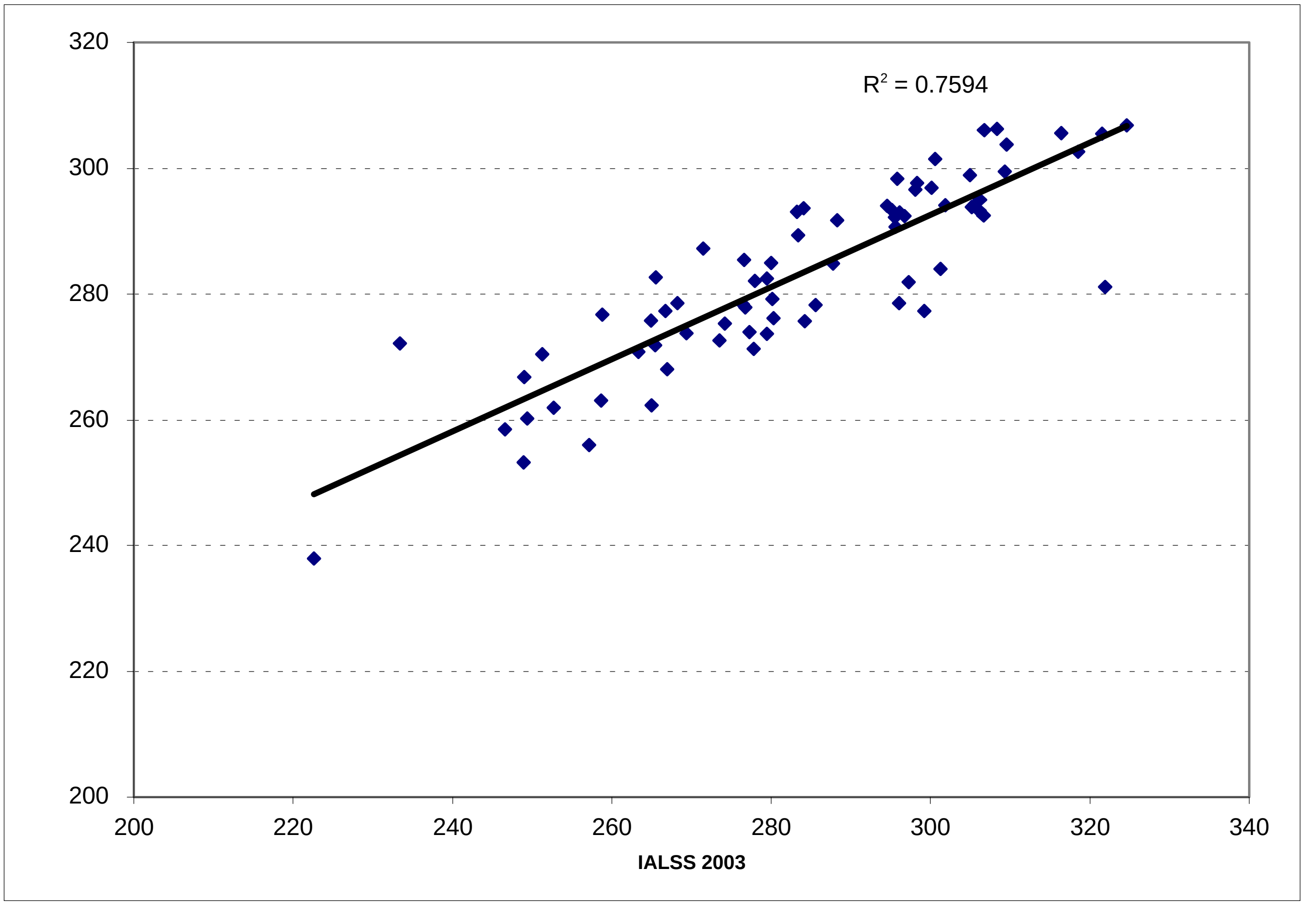


Figure B2 plots the average literacy scores derived from IALSS 2003 against those imputed for the 2006 Census by industry. The figure reveals that the level of agreement between the two sources is somewhat lower, a fact that we believe is related to reporting differences between the two surveys.

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 23% of the estimated number of workers in shortage and 18% of the aggregate literacy point spread. Moreover, the average point spread per worker for un-profiled occupations is 19 points compared to 43 points for profiled ones. Thus, if anything, imputing the average demand levels for un-profiled occupations underestimates the true 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 literacy 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.

Standard Errors on key estimates

All estimates presented in this volume are based on the imputation of literacy scores and market segments and are thus subject to error. The fact that the estimates are based on a 20% sample of the entire population means that sampling errors have little impact. The key source of error is thus the imputation error.

The approach taken to the imputation of literacy scores reduces the impact that imputation error has on key estimates of literacy supply and shortage. Multiple imputation is used to generate 25 scores which are then averaged, the average grouped into proficiency levels and then summed by occupation and industry. While there is significant error around each individual imputation averaging, grouping into proficiency levels and summing over individuals greatly reduces these errors and their impact on the analyses. The probability that an individual is placed in the wrong level are very low.

The imputation of market segments follows the same approach. Imputation errors are higher because of the small sample size of the ISRS sample. The distribution of potential learners by market segment does, however, replicate that observed in the ISRS sample controlling for age group, gender, education, mother tongue, immigration status and aboriginal status.

It is the authors opinion that the magnitude of error is negligible so is unlikely to have an undue influence on the conclusions as presented. More importantly the estimates are believed to be unbiased. Thus, the true size of the literacy supply and literacy shortages may vary from those presented but will do so in a uniform way. There is one exception to this assertion. The size of the literacy supply and of literacy shortages maybe under and over-estimated respectively where the selection of workers into occupations increases their literacy level relative to their peers once one has controlled for age group, gender, mother tongue, immigrant status, aboriginal status and the first digit of occupation.

The errors associated with key estimates must also be interpreted within the objectives set for the current analyses. In truth, even if literacy skill shortages were half the size presented the basic conclusions would still hold.

The following two tables provide an indication of the size of standard errors around estimates of the number of points between the individual's prose literacy score and the score needed to satisfy the minimum required by their occupation and industry. This gap is referred to as the prose literacy spread. The confidence intervals around the prose spreads are central to the analysis because they are what define the incidence and depth of literacy skill shortage. These estimates reflect both sampling and imputation error.

Table A2 Standard errors and confidence intervals on prose literacy spreads by industry, Canada, 2006

Industry	Average Prose Spread	1.96 * STE (Avg.)
Petroleum and Coal Products Manufacturing	25	1.6
Textile Mills & Textile Product Mills	42	1.3
Fishing, Hunting and Trapping	42	1.3
Beverage and Tobacco Product Manufacturing	28	1.2
Warehousing and Storage	30	1.2
Waste Management and Remediation Services	30	1.1
Heritage Institutions	20	1.1
Clothing Manufacturing & Leather & Allied Product Manufacturing	53	1.0
Electrical Equipment, Appliance and Component Manufacturing	33	1.0
Private Households	38	0.9
Non-Metallic Mineral Product Manufacturing	33	0.9
Travelling Services	26	0.9
Miscellaneous Manufacturing	33	0.8
Forestry and Logging with support activities	29	0.8
Employment Services	28	0.8
Primary Metal Manufacturing	32	0.8
Information Services and Data Processing Services	20	0.8
Furniture and Related Product Manufacturing	41	0.7
Motion Picture and Sound Recording Industries	22	0.7
Printing and Related Support Activities	32	0.7
Rental & Leasing Services and Owners & Lessors of Other Non-Financial Assets	26	0.7
Advertising and Related Services	23	0.7
Paper Manufacturing	30	0.7
Security Services	29	0.7
Plastics and Rubber Products Manufacturing	38	0.7
Management of Enterprises and Other Administrative Services	26	0.7
Computer and Electronic Product Manufacturing	27	0.7
Chemical Manufacturing	28	0.7
Other Professional Services	20	0.6
Wood Product Manufacturing	35	0.6
Machinery Manufacturing	30	0.6
Performing Arts, Spectator Sports and Related Industries	23	0.6
Publishing Industries	22	0.6
Business Services	22	0.6
Post-Secondary Education	17	0.6
Fabricated Metal Product Manufacturing	34	0.5
Other Schools and Educational Support	20	0.5
Securities, Commodity Contracts, and Other Intermediation and Related Activities	20	0.5
Utilities	22	0.5
Food Manufacturing	39	0.5
Accommodation Services	30	0.5
Accounting and Tax Preparation	21	0.5
Building Services	36	0.5
Personal and Laundry Services	31	0.5
Amusement, Gambling and Recreation Industries	25	0.4
Legal Services	18	0.4
Transportation Equipment Manufacturing	33	0.4
Real Estate	27	0.4
Broadcasting and Telecommunications	21	0.4
Repair and Maintenance	30	0.4
Management, Scientific and Technical Services	19	0.4

Mining and Oil and Gas Extraction	22	0.4
Insurance Carriers & Related Activities and Funds & Other Financial Vehicles	22	0.4
Religious, Grant-Making, Civic, and Professional and Similar Organizations	22	0.4
University Education	18	0.4
Nursing and Residential Care Facilities	27	0.4
Crop Production	38	0.4
Computer System Design Services	17	0.3
Provincial and Territorial Public Administration	19	0.3
Architectural, Engineering and Design Services	18	0.3
Local, Municipal & Regional Public Administration and Aboriginal, Inter & Other Extra-Territorial Public Admin	23	0.3
Monetary Authorities - Central Bank & Credit Intermediation and Related Activities	22	0.3
Social Assistance	22	0.3
Prime Contracting	29	0.3
Trade Contracting	30	0.3
Federal Government Public Administration (including Defence Services)	20	0.3
Ambulatory Health Care Services	22	0.3
Hospitals	23	0.3
Transportation	31	0.2
Food Services and Drinking Places	32	0.2
Wholesale Trade	28	0.2
Primary and Secondary Education	18	0.2
Retail Trade	29	0.2
Total	27	0.1

Table A3 Standard errors and confidence intervals on prose literacy spreads by occupation, Canada, 2006

Occupations		**1.96 * STE (Avg.)**
Supervisors in Manufacturing	39	0.8
Heavy Equipment and Crane Operators Including Drillers	33	0.6
Other Trades N.E.C.	36	0.6
Clerical Supervisors	23	0.6
Occupations Unique to Forestry Operations, Mining, Oil and Gas Extraction, and Fishing, Excluding Labourers	37	0.6
Contractors and Supervisors in Trades and Transportation	31	0.6
Sales and Service Supervisors	30	0.6
Primary Production Labourers	32	0.5
Occupations in Travel and Accommodation Including Attendants in Recreation and Sport	28	0.5
Assemblers in Manufacturing	44	0.5
Labourers in Processing, Manufacturing and Utilities	46	0.5
Stationary Engineers, Power Station Operators and Electrical Trades and Telecommunications Occupations	26	0.5
Machinists, Metal Forming, Shaping and Erecting Occupations	31	0.4
Chefs and Cooks	36	0.4
Childcare and Home Support Workers	32	0.4
Finance and Insurance Administrative Occupations	23	0.4
Machine Operators in Manufacturing	46	0.4
Assisting Occupations in Support of Health Services	27	0.4

Professional Occupations in Health	19	0.4
Occupations in Food and Beverage Service	29	0.4
Technical and Related Occupations in Health	22	0.4
Senior Management Occupations	22	0.4
Occupations Unique to Agriculture Excluding Labourers	38	0.4
Cashiers	32	0.4
Occupations in Protective Services	26	0.4
Professional Occupations in Art and Culture	20	0.4
Secretaries	26	0.3
Trades Helpers, Construction, and Transportation Labourers and Related Occupations	34	0.3
Wholesale, Technical, Insurance, Real Estate Sales Specialists, and Retail, Wholesale and Grain Buyers	28	0.3
Mechanics	29	0.3
Nurse Supervisors and Registered Nurses	21	0.3
Construction Trades	32	0.3
Technical Occupations in Art, Culture, Recreation and Sport	21	0.3
Transportation Equipment Operators and Related Workers, Excluding Labourers	36	0.3
Administrative and Regulatory Occupations	22	0.3
Managers in Retail Trade, Food and Accommodation Services	25	0.3
Paralegals, Social Services Workers and Occupations in Education and Religion, N.E.C.	19	0.3
Specialist Managers	20	0.3
Professional Occupations in Business and Finance	20	0.3
Other Managers N.E.C.	21	0.2
Judges, Lawyers, Psychologists, Social Workers, Ministers of Religion, and Policy and Program Officers	15	0.2
Retail Salespersons and Sales Clerks	29	0.2
Technical Occupations Related to Natural and Applied Sciences	17	0.2
Professional Occupations in Natural and Applied Sciences	15	0.2
Sales & Service Occupations N.E.C.	35	0.2
Teachers and Professors	14	0.2
Clerical Occupations	24	0.1
Total	35	0.0

The confidence intervals are so small relative to the number of points individuals are below their requisite levels that only individuals right on the boundary between levels would be mis-classified. Assuming that the errors are normally distributed these errors would offset one another.

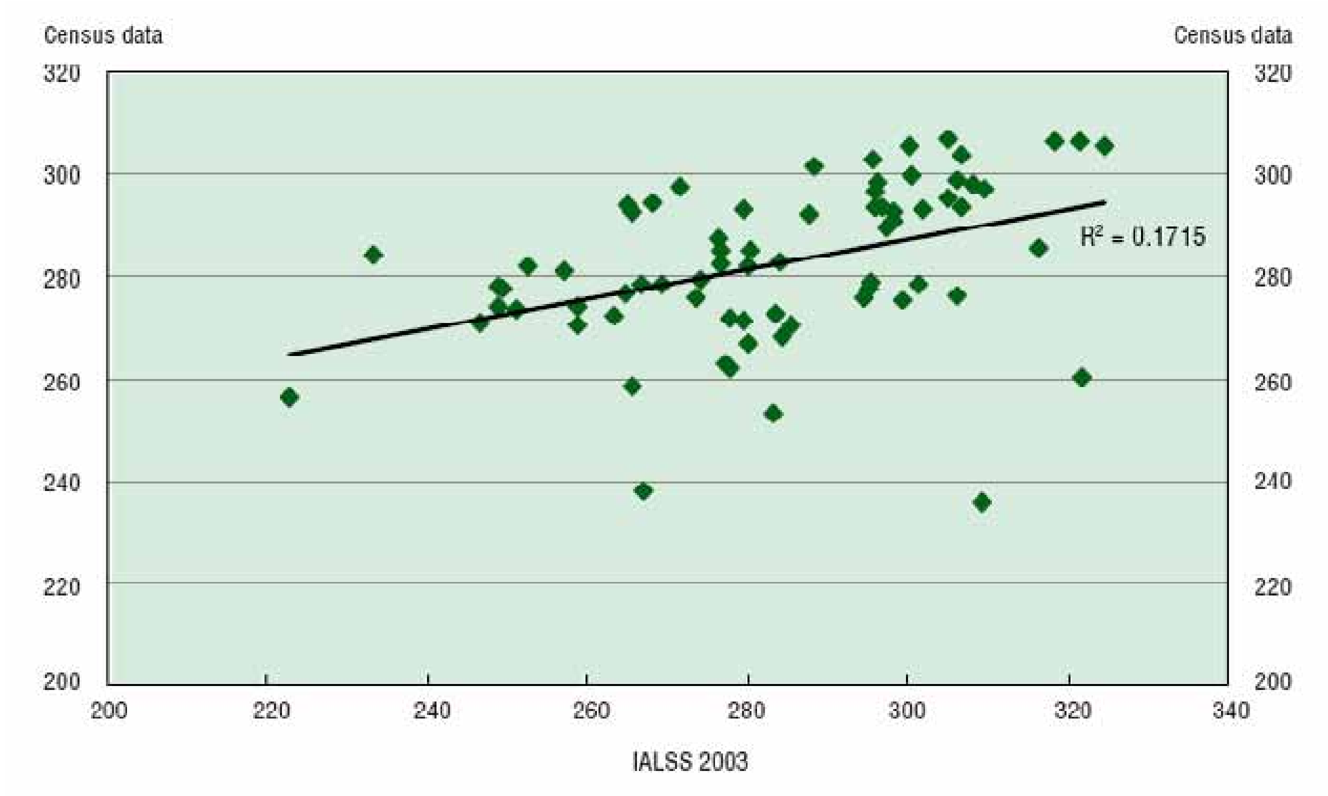
Standard errors for other key estimates are available at www.dataangel.ca.

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.